POWER, PRODUCTION AND PRESTIGE:

TECHNOLOGICAL CHANGE IN THE LATE CLASSIC CERAMICS OF PIEDRAS NEGRAS, GUATEMALA

by

Arturo René Muñoz

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As members of the Dissertation Committee, we certify that we have read the dissertation prepared by Arturo René Muñoz entitled *Power, Production and Prestige: Technological Change in the Late Classic Ceramics of Piedras Negras, Guatemala* and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

T. Patrick Culbert ____________ Date: 12 April 2006
Dr. T. Patrick Culbert

____________ Date: 12 April 2006
Dr. Takeshi Inomata

____________ Date: 12 April 2006
Dr. Barbara J. Mills

____________ Date: 12 April 2006
Dr. John Olsen

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

T. Patrick Culbert ____________ Date: 12 April 2006
Dissertation Director: (Dr. T. Patrick Culbert)

____________ Date: 12 April 2006
Dissertation Co-Director: (Dr. Takeshi Inomata)

STATEMENT BY AUTHOR

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SIGNED: ____
Arturo René Muñoz

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ABSTRACT

The Classic Maya site of Piedras Negras is a located at the western edge of El Peten, Guatemala. From 1931 to 1939, and again from 1997 to 2000, the site was subject to investigation, first by a project directed by Linton Sattherwaite of the University of Pennsylvania, and later by a project directed by Stephen Houston and Hector Escobedo. Beginning in about A.D. 650 the ceramics of Piedras began to undergo a period of rapid and profound changes that culminated in the development of a distinct regional polychrome style distinguished by the use of an elaborate resist and resist-reserve technique with few analogs elsewhere in the Maya Lowlands.

At most Classic Maya sites, the development of a regional ceramic style involved the elaboration of known and widely practiced decorative techniques, such as positive painting. At Piedras Negras, Guatemala, however, this development was manifested by the creation of a distinct tradition emphasizing the use of an elaborate true resist technique. Because the development of this style was the result of new technological practices, rather than the elaboration of extant styles, we are allowed a unique perspective on material culture change. Rather than invoking rational, deterministic explanations to account for the transformations visible in the Piedras Negras ceramics, change is framed primarily as a social phenomena whose study requires a uniquely historical, social, and cultural point of view.

Chapter 1

EVOLUTION, AGENCY, AND MATERIAL CULTURE CHANGE IN THE ARCHAEOLOGICAL RECORD

> …[We] can speak, rather trivially, of the intent being the proximate cause of something, but of what analytical value is such a statement? Proximate causes, in any scientific framework, are functional cause, i.e. how things work. To invoke intent explanation robs valid functional questions of their interesting parts and replaces them with vitalistic, directional components [O'Brien and Holland 1990:44].

> If human intentions cause human history and diversity, then do we suppose that squirrel history and diversity, or oak tree history and diversity, or star history and diversity are the consequences of squirrel intentions, or oak tree intentions, or star intentions? Generally not. These phenomena are understood without recourse to vitalism [Dunnell 1989:37].

Though changes in artifact style are of preeminent importance to archaeologists, too often the social component of such changes goes unexamined, and change is cast as an automatic process unfolding according to its own inevitable logic independent of social and cultural processes (Pfaffenberger 1992: 237). This is not so much due to the limitations of the archaeological record as it is the lack of a body of theory for dealing with change in anything other than narrowly defined functional attributes. Attributes which are not obviously utilitarian are too often equated with decoration, defined as epiphenomenal, and placed beyond the bounds of empirical archaeological analysis. As a result, much of the most intriguing variation in material culture is understudied. This has had a particularly negative impact on the study of Maya ceramics.

In working with ceramics from the Maya Lowlands, numerous authors have noted the increasing regionalization in Classic period (c. A.D. 250 – 900) polychromes (Ball

1977; Fry 1969; Reents 1983; Rice 1987a; Smith and Gifford 1965). Some researchers tie this development directly to changes in the organization of ceramic production (e.g. Fry 1969; Rice 1987a). Although such changes in production organization must have encouraged the development of regional ceramic styles, the question of why these changes occurred, and why they should contribute to the development of distinct ceramic styles, has not been adequately investigated. Ball (1993) presents a model for the organization of ceramic production and a rationale for the development of regional ceramic styles, but does not explore the mechanism by which change may have occurred.

At the Classic Maya site of Piedras Negras, Guatemala the development of a regional style was manifested by the appearance of resist decorated ceramics.[1] Though this style of decoration is known from elsewhere in the Maya Lowlands, nowhere did it develop with the same vigor as at Piedras Negras. In fact, the positive painted tradition characterizing the great majority of all Classic Lowland Maya pottery developed only weakly at Piedras Negras, never becoming as common or as elaborate as at other Maya sites. Inomata (2001:333) has characterized the historical development and elaboration of positive painting as well as other kinds of craft specialization at most Classic Maya sites as "highly involutionary," by which he means that much artistic and stylistic development occurring during the Late Classic involved increasing elaboration and sophistication within the same technological schemes. This was not the case at Piedras

[1] Resist and resist-reserve are a form of reserve space decoration in which design is applied first with a waxy or viscous material and then covered with slip or paint. During firing, the resisting material burns off, revealing a design in the underlying color. The slip or paint applied over the resisting material prior to firing serves as the ground color through which the design appears. In overall effect, this style of decoration is very similar to the batik method used to decorate textiles.

Negras, however, where artistic development took the form of new technological practices, rather than the elaboration and modification of extant decorative styles.

It is this process of technological innovation and diffusion that is the subject of this dissertation. More specifically, this dissertation examines the social processes governing technological change, taking the invention, elaboration, and propagation or resist and resist-reserve pottery decoration at the Classic Maya site of Piedras Negras as a case study. The goal of this dissertation is not to provide a synthetic theory of technological change applicable in all cases, but rather to examine different approaches to the study of technology and arrive at a synthetic approach useful for describing change in a single case – the Late Classic ceramics of Piedras Negras, Guatemala – settling on an approach utilizing the wealth of archaeological, historical, ethnohistorical, and ethnographic data available from the Maya area to construct a model for technological change that may have wider applicability.

Intent, Evolution and Technological Change

In the quotes heading this chapter the utility and impact of intent on the course of human history are downplayed in favor of universal processes that remove from consideration humans' uniquely cultural status. Although this may be appropriate when considering long-term changes in human behavior, particularly those operating over evolutionary time, it may not be suitable for explaining changes in human behavior or material systems occurring over the course of a few generations. Intent, as presented above, is an easily dismissed explanation for material culture change. Little can be said for the existence of an abstruse collective will, and though prominent individuals may effect proximate changes in material culture or social life, individual will alone is insufficient to effect systemic change.

Intent, in the archaeological record, is better defined as by the result of individual and what might be called aggregate agency – the idea that culture change, however defined, is an emergent phenomenon taking form through the seemingly independent decisions of people acting in a particular social milieu. The interactions of individuals and groups produce coherent phenomena on a scale impossible to predict from the intentions of the participants, and these effects may manifest in entirely unexpected ways. Though intentions, strategies and decisions are not necessarily isomorphic with outcomes, they do impact the direction of future events, defining the range and scale of interactions between individuals and groups and their natural and social environments.

From this perspective, the processes driving the cultural evolution are not fundamentally different from the evolutionary processes driving oak or squirrel evolution. The differences lie in the way these organisms utilize and transmit information, the manner in which variation is generated, and the nature of the conditions to which human societies must adapt. These differences do not make humans special creations; rather, they highlight humans' uniquely evolved capacity for communication, invention and adaptation. It is the degree to which this capacity can be taken into account in explaining change in the archaeological record that is the subject of this dissertation.

The following section provides a general overview of three approaches to the study of artifact change. On the one side are Darwinian explanations stressing the direct application of evolution to matters of artifact change in the archaeological record. These approaches have been successful in dealing with change in relatively simple human societies over evolutionary time. When evolutionary thinking is applied to complex societies and short-term changes in material inventories the results are less satisfactory.

Opposite of these methods, are those taking a more nuanced approach to understanding the causes of material culture change. These approaches, generally constructivist in nature, are diverse, draw on immediate historical and social contexts, and usually relate material culture changes to choices, conscious or not, made by human beings acting in self-interested though not necessarily rational ways. These approaches are generally employed when explaining changes that took place over relatively short periods of time and occurred in complex societies. While these approaches can provide explanations for archaeological phenomena that are historically sensitive and admit a wider variety of comparative data, they are often perceived as particularistic and lacking general heuristic value.

Three Approaches to Material Culture Change

Darwinian approaches to material culture or, better, to artifact change in the archaeological record can be grouped into three general approaches.[2] The first approach, Evolutionary Archaeology, focuses on artifact change in the archaeological record as a result as a result of *genetic* differences arising as a result of natural selection acting on adaptively random cultural variation. The second approach, Evolutionary Ecology, focuses on cultural and behavioral changes resulting from adaptive *phenotypic* variation resulting from short-term decision, strategic making in reaction to exogenous, environmental

[2] Kuhn (2004) has described a third manner in which evolutionary theory is put to use - he describes studies linking changes in artifact form or techniques of manufacture to evolutionary changes in human cognition or neuro-muscular systems.

conditions. Variation generated in this manner is not necessarily evolutionary. Rather, it is the result of an evolved capacity for adaptation. In contrast, Evolutionary Archaeologists minimize the role of adaptation via decision-making, ascribing change to the action of natural selection on culturally inherited variation.

In contrast to these two positions are those grouped under the rubric of Social Construction of Technology. Though Social Constructionist approaches are quite diverse, they offer an understanding of material culture and technological change that accounts for the variable effects of agency and intent on the direction of technological innovation and technological evolution. The aim is to divorce archaeological studies of technological change and technological evolution from the 'somnambulism" inherent in other approaches to technological change (Winner 1986). The following sections review Darwinian and Constructionist positions in more detail.

Evolutionary Archaeology

Practitioners of Evolutionary Archaeology, selectionists, take an explicitly evolutionary approach to artifact change, applying concepts such as selection, drift, and mutation in explaining artifact and behavior change. Selectionists insist that the subject matter of archaeology is not human behavior; rather it is the archaeological record – the material residues of past human existence. These residues - artifacts, tools, and technologies - are the "hard parts of the human behavioral phenotype" (Dunnell 1989:44) in the same way that birds' nests and spider webs are an extension of birds' and spiders' phenotypes. Taken this way:

> …artifacts do not 'represent' or 'reflect' something else that is amenable

> to evolutionary theory; they are part of the human phenotype. Consequently artifact frequencies are explicable by the same processes as those in biology" [Dunnell 1989:45]

Phenotypes are the combined results of genetic predispositions and environment. The differential reproductive success of some phenotypes results in the gradual increase through time of phenotypes better suited to local environments. The survivability of a technology depends on its ability to out-compete other technologies, that is, to perform its function in such a way that it maximizes its chances for reproductive success (Lyman and O'Brien 1998; Neff and Larson 1997; O'Brien and Holland 1990, 1992; Rindos 1989). The literature within evolutionary archaeology is unclear on the mechanisms driving selection. One possibility is that selection works via reproductive differences stemming from variability in artifact design and use and the resultant disparities in the ability to efficiently make use of local resources (O'Brien and Holland 1995:190-191; Ramenofsky 1995:135-139). For others it is the replicative success of the behavior or artifacts and is independent of an individual's or population's reproductive success (Jones et al. 1995; Leonard and Jones 1987; Teltser 1995a:5-6).[3]

Selectionist explanations for artifact change rest on the reconstruction of an artifacts lineage – the genealogy of the technology or artifact under study (Lyman and O'Brien 2000; O'Brien and Lyman 2002). Explanations for the observed changes are historical narratives whose ends are, in all cases, an accounting for the differential reproduction of

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[3] In neither case, however, is it clear exactly what the mechanism of transmission are. Some have borrowed concepts from socio-biology suggesting that memes, (Dawkins 1976) a unit of information analogous to genes and subject to the same evolutionary forces, are the basic means by which cultural information is transmitted. This concept, however, ties cultural evolution to biological evolution with differential survival dependent the ability of one group, however defined, to out compete another.

technologies. Proponents of this approach to the archaeological record dismiss all prior explanations of the past as unscientific and vitalistic, and seek to change the manner in which archaeologists study the past (O'Brien and Holland 1995:193–194). Selectionists propose that the strict application of Darwinian theory to the archaeological record can provide a scientific understanding of human technological and cultural evolution, one that operates without recourse to human agency, decision–making, or behavioral reconstruction (Dunnell 1989; Teltser 1995a). Human agency and intent are not considered useful explanatory devices by Selectionists because, "only in rare cases can we, with any degree of certainty, know anything about how prehistoric peoples organized themselves socially" (O'Brien and Holland 1992:2). Selectionist explanations only admit inferences concerning the gradual and unintentional evolution of technology.

As a result, transformational changes, that is, those changes occurring rapidly and with no archaeologically visible antecedents, are not amenable to analysis under this paradigm. Though not often explicit, the kinds of changes most amenable to evolutionary analysis are those that take place over several centuries and that result in the development of archaeologically visible artifact lineages (O'Brien and Lyman 2002, 2003). Changes occurring over the course of a few generations are simply too rapid for archaeologically visible artifact lineages to develop. For example, given the absence of clear antecedents for Clovis technology, there can be no Selectionist explanation for the appearance of this technology in the New World. However, the developmental trajectory of Clovis "related" projectile point types in the New World is amenable to evolutionary explanation.

There are several advantages to a Selectionist approach. First, Selectionist explanations for artifact change are historically contingent. That is, change is a historical process in which some features of analytical interest are dependent on antecedent forms. Stated differently, past developmental trajectories structure, limit and to some extent direct the course of future change. The range of actions possible in the present are structured by past events and, in turn, work to structure and constrain future possibilities. This same line of thinking informs the work of Evolutionary Ecologists (see below) and creates a possible bridge to other kinds of explanations for material culture change in the archaeological record. In addition, selection is a universal process. Even though particular cases can only be explained with reference to a specific event or a unique developmental path, the process of selection is operative everywhere and at all times and can be applied to a wide variety of cases with only minimal assumptions about the behavioral or cognitive capacities of the organisms under investigation.

Despite these conceptual advantages, the approach is fettered by its limiting definition of style and exclusive focus on functional attributes. Functional attributes are defined as those traits having a non-random distribution through time and that can be arranged into lineages having a definite genetic component. In contrast, non-functional or "stylistic" traits have a stochastic distribution through time and space. This distribution is best conceived as the kind of bell-shaped curve that makes the practice of archaeological seriation a useful tool for establishing chronologies. Such curves are thought to be the result of "neutral evolution," that is the evolution of traits not under selective pressure (Neiman 1995 ; O'Brien and Holland 1995; O'Brien and Lyman 2000). Stylistic attributes are often equated with decoration, defined as epiphenomenal, and placed beyond the bounds of empirical archaeological analysis (Carr and Neitzal 1995:151–170; Dunnell 1978; Hegmon 1992, 1998; O'Brien and Dunnell 1996). This is a difficult position to justify. It is clear from recent simulations that adaptively random behavior can lead to patterning in the archaeological record that appears to be the result of complex, planned actions (Brantingham 2003, Shennan and Wilkinson 2001). Similarly, behaviors under selective pressures can present stochastic distributions through time, a state Selectionist define as indicative of "stylistic" behaviors. A stochastic distribution may result, however, in "Red Queen" environments, where the evolutionary trajectory of specific traits is driven, at least in part, by complementary evolutionary changes in competing organisms (Maynard-Smith 1976; Van Valen 1973).

The utility of Evolutionary Archaeology is further limited by the insistence that technologies are tied directly to reproductive success, a criticism voiced even by proponents of the Evolutionary Archaeology (Neff 2000). While this may be appropriate when considering long-term transformations in human cultures, particularly those involving adaptations to changing ecological or environmental conditions, it is a less secure approach when considering processes that are of much shorter duration and are subject to cultural rather than natural selection. Though similar in that both the Ecological and Evolutionary approaches emphasize the differential reproduction of traits, the former emphasizes changes in behavior or culture that are independent of biological survival and reproduction, while the latter operates only at the level of biology and is tied exclusively to biological reproduction.

The result is that cases invoking cultural selection may have results that differ significantly from those expected when only natural selection is at work. This is not because there are fundamental differences in the manner in which selective processes operate – in both cases the most likely candidate for selection is that variant of a trait best suited to the contemporary selective milieu. Rather, the difference exists because cultural and social reproduction can and do operate independently of biological reproduction, and because the processes leading to the production of cultural and social variation and the mechanisms of transmission for non-biological traits are much more labile than the mechanisms of genetic transmission. Received genetic information is not subject to the same kinds of manipulation and modification as is received cultural information. As a result, behaviors and cultures can change much more quickly and in response to a wider variety of stimuli than can those traits that are determined genetically. It is this kind of variation that is addressed by Darwinian approaches of a different bent.

Evolutionary Ecology

The second major Darwinian approach to the archaeological record is Evolutionary Ecology. Of the two evolutionary programs reviewed in this chapter, Evolutionary Ecology has the greater potential for explaining the rapid, short-term changes in artifact assemblages characterizing much of the archaeological record, particularly of complex societies. Rather than emphasizing Darwinian processes of biological descent with modification, evolutionary ecologists emphasize the evolved capacity of organisms to make evolutionarily adaptive choices to cope with immediate environmental stresses. These stresses may include climatic change, change in the availability or behaviors of prey species, or change in predator behaviors or populations. These choices are most often framed in terms of optimality models, with biological fitness conferred on those organisms making most efficient use of local resources.

Optimality models are derived primarily from economic theory, where economic efficiency is used as a proxy measure for reproductive potential. It is assumed that an individual who is able to more efficiently obtain the resources needed for survival will have more energy to devote to other pursuits such as reproduction and childcare, prestige building and networking (Kuhn 2004; Smith 1992a, 1992b, Smith and Winterhalder 1992).[4] Many of the models utilized in behavioral ecology compare the relative advantages and drawbacks of different behavioral strategies or alternatives to arrive at an optimal solution. Importantly, these different behavioral strategies would apply whether the behaviors under study were biologically determined or the result of choice. This leads to a significant difference between the two evolutionary approaches.

Like Evolutionary Archaeology, Evolutionary Ecology explains cultural and behavior as forms of phenotypic adaptation to varying social and environmental conditions, using the assumption that evolution has designed organisms to respond to local conditions in fitness enhancing ways. Phenotypic responses are constructed on the basis of "decision rules" – genetically evolved cognitive mechanisms that guide development, learning, problem solving, and stimulus response. Taken this way, behavioral variation is not the result of selection. Rather, it is the *capacity* to adapt cognitively or physiologically that is the result of selection. "Selection enters the equation

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[4] Bamforth (2002) criticizes this approach, citing the lack of evidence connecting increased efficiency in resource utilization with enhanced reproductive success. He argues that this relationship is assumed rather than supported by a body of middle-range theory.

indirectly – as a process that moved the organism to respond facultatively and adaptively to particular environmental conditions” (Boone and Smith 1988:144).

As Kacelnik and Krebs point out:

> Although optimality models use an evolutionary logic, they are not constructed to test the hypothesis that evolution has occurred. Nor do individuals studies test the principle by making predictions about behavior using the notion of ‘design by natural selection’…We do not gain much further knowledge about human evolution, but we do learn a lot about what current humans do.” (1997:22)

In contrast to Evolutionary Archaeology, Evolutionary Ecology while making use of evolutionary principles does not necessarily depend on natural selection and biological processes for explaining *behavioral* changes. Modern humans, the subject of archaeology and anthropology, are a biologically evolving species. However, given the time-depth of most archaeological studies, what is of interest is not human biological evolution, but human behavioral and cultural evolution - a process that can and does happen much more quickly and in response to a wider variety of stimuli than biological evolution.

Behavioral changes occurring in response to environmental or other factors such as variation in prey abundance or climate change are the most important sources of phenotypic variation. This variation, however, does not constitute evolutionary (read genetic) change. Natural selection’s primary role is in accounting for the evolution of the cognitive mechanisms making rapid, fitness-enhancing phenotypic adaptations possible, and not necessarily culling behavioral variation or directing the development of specific behavioral forms. Accordingly, there is no expectation that the selected behaviors will be a perfectly optimal or efficient solution. Optimality or efficiency is constrained by behavioral demands in other realms and prior adaptive strategies. The aggregate consequences of individual phenotypic variation recursively affect ecological conditions and elicit new phenotypic variations to these altered conditions. Given this, phenotypic changes apparent in the archaeological record cannot be assumed to be the sole result of natural selection acting on culturally transmitted variation. Rather, phenotypic changes are structured by prior behavioral strategies that are themselves the result of even earlier processes. New behavioral variations exert a similar influence, constraining and structuring the form and content of future phenotypic variations.

Beyond the recognition of behavioral constraints, Evolutionary Ecology has no means for effectively dealing with these issues or their impact on technological innovation, particularly when the factors appearing to exert the most significant influence on the direction of phenotypic change appear to have little relationship to the natural environment. However, the links between practices, tradition, and identity do provide a means for modeling material culture change, linking strategies with technological practice in those cases where the observed shifts in material culture seem to have little adaptive value if only their mechanical function is considered.

The Social Construction of Technology

In contrast to Evolutionary Archaeology and Evolutionary Ecology are constructionist approaches emphasizing a more social and humanistic (as opposed to a biological or economic) approach to understanding the course of material culture change. The term “material culture” is used here purposefully to highlight an epistemological difference between evolutionary, particularly Selectionist, approaches to the archeological record and more humanistic approaches to the same. Evolutionary approaches focus almost exclusively on artifacts as the residues of human behavioral systems, describing past adaptations to environmental or ecological conditions, and serving to enhance reproductive success. In this sense, artifacts are tools or technologies with only a functional or utilitarian value. The ideological and social component of a technology or tool is not considered as integral to an artifact's design or function. While Evolutionary Ecology admits the possibility that factors other than mechanical efficiency influence the direction of technological or material culture change, there is no means for dealing with these factors or for understanding how they may affect the direction of change. It is these factors that are the subject of constructionist approaches.

Considerable theoretical diversity is encompassed by these three principles and includes proponents of technological style (Childs 1991; Lechtman 1977; 1984; Stark 1998), practice and agency theory as applied to the study of technological change (Dietler and Herbich 1998; Dobres 2000; Dobres and Robb 2000) and much ethnoarchaeology (David and Kramer 2001). Despite this theoretical diversity Social Constructionists approaches hold several ideas in common. First, Social Constructionists reject explanations invoking selection, market force, efficiency, adaptation or the inevitability of progress (Pfaffenberger 1992) as the principle or sole causes of material culture change. Though these factors do play a significant role in determining the course of technological evolution, particularly in capitalist economies, Social Constructionists believe that technological choices are at least as strongly influenced by the beliefs, social structure and prior choices of the society or group under study (Killick 2004). Finally, Social Constructionists invoke the idea of technological equivalence (Lemmonier 1992), that is, given a set of technological constraints, there is more than one way of accomplishing a given technical task. These principles have several implications for constructionist approaches to the study of material culture or technological change. What follows is an explication of a particular line of reasoning representing what I see as the most fruitful avenue for approaching material culture change in complex societies.

Given the possibility of technological equivalence, the final form of a technology is sufficiently undetermined to allow for multiple possible designs. The ultimate form a technology takes is the result of an open process that can produce different outcomes depending on the social circumstances of development. From this perspective, the choice of one technology over another when no choice offers an obvious material or technical advantage results in part from negotiations between competing or cooperating social groups (Klein and Kleinman 2002; Pinch and Bjiker 1987). Different groups embody specific interpretations of artifact or technologies, and different groups imagine and construct different objects based on the meanings attached to them. Furthermore, decisions to innovate or adopt may reflect only the narrow interest of a specific group and are not necessarily intended to improve overall social well-being (Gosselain 2000; Kim 2001). Given this, power relations among potential adopters or innovators, and the relationship between their interests and the social, political, and economic contexts in which innovation takes place must influence processes of innovation or adoption (Klein and Kleinman 2002:30).

The unequal distribution of power and knowledge, of social and cultural capital

(Bourdieu 1977), expressed as the strategies and decisions of high-status individuals impact the behavior of other potential adopters (Papousek 1989). Elites may, according to their interests choose to restrict or encourage others' access to information about new technologies (Kim 2001:447; Schiffer 1992). It is this restricted knowledge, in the form of cultural capital, which contributes to an individual or group's social, political and economic standing. The links between differential access to technologies or knowledge and status is well documented ethnographically as an important element in creating and maintaining elevated social standing (Helms 1993; see also contributors to Brumfiel and Fox 1994).

The culturally competent production and consumption of material culture is integral to the production and expression of individual and collective identity. As Killick (2004:573, see also David and Kramer 2001:303–359) notes, technology in the pre–industrial world creates persons as well as products. Objects simultaneously acquire and confer identity as they move through various stages of the manufacturing process, and as they pass from artisans to owners who are embedded in different social networks and engaged in a variety of social interactions. It follows from this the objects have life histories (Appadurai 1986; Gosden and Marshall 1999; Hoskins 1998) and the appropriation of material culture through acts of production and consumption is a social strategy.

As strategy, however, the appropriation of material cultural is not necessarily conscious. Some acts of appropriation may be so embedded in cultural values they remain unnoticed, while others are deliberate expressions of identity. This can be extended to include chaînes opératoires (Leroi–Gourhan 1945, 1993) and the concept of a "technical identity" incorporating different facets of an individual's identity and corresponding to the network of social interactions structuring the manufacture of craft goods (Gosselain 1998). This suggests that an appropriate definition for technology may be a "meaningful and socially negotiated set of material-based practices, as well as the technical means by which to make them" (Dobres and Hoffman 1999:213).

As "material based practices," technologies are underpinned by a cultural logic, a set of tradition-bound rationalizations for why things are done the way they are. In this sense, the material practices defining technology are indeed "hardened history...frozen fragment[s] of human and social endeavor (Nobel 1986:xi). As practices these traditions have "doxic" referents, that is, they take the form of practical or commonsensical forms of knowledge that are continuously altered as people enact, embody, or recreate those traditions in the everyday processes of waking and working (Bourdieu 1977; Giddens 1979, 1984). Practices are not behaviors, nor are they necessarily invariant or goal-oriented. They are dispositions defining fields of action and perception. These forms of knowledge are learned and internalized through day-to-day experiences ranging from daily routines to participation in political rituals.

As a result, explanation dependent practices are less dependent on the teleological, functional content of arguments that invoke behavior as explanation and interpret the archaeological record as a series of linear equations. Practices may be functional, but as dispositions, representations and actions, they are not closed systems; they are open to modification, though alteration is not necessarily intentional or purposive. Subtle (and not so subtle) situationally specific variations in action, the application of cultural logic to novel situations, may have unintended, long-term consequences (e.g. Sahlins 1985), altering the fields of action and affecting the formation and content of future dispositions.

The doxic elements of practice may become politicized "orthodoxies," which may manifest as expressions of individual and group identity (Bourdieu 1977). To the extent that power is the ability to constrain or affect the outcome of an event or series of events (Wolf 1990), practices can be understood as negotiations between and among individuals and larger social entities (Giddens 1979) as they strive to define, assert and express particular political and social ideals. These negotiations, in turn, affect social forms, e.g. patterns of accommodation, domination, hierarchization, that find expression through practice. This process of negotiation, and the attendant co-opting of ideas and values, is an eminently political process, one that takes place every day and in a variety of material forms, from the mundane to the extraordinary.

Hendon (1996) notes that that pottery use is part of an everyday discourse in which power, tradition, gender, ethnicity, cosmology, and political allegiance are negotiated in the day–to–day practices of pottery production, use, and discard. For example, Mills (Mills 2002, see also Mills 1999; Hardin and Mills 2000) notes that ceramic technologies changed substantially during the consolidation of Zuni populations between A.D. 1630 and A.D. 1680. These changes included shifts in vessel form and decorative motif and the re–introduction of glaze paint technology. Decorative modes shifted again following the Pueblo Revolt of A.D. 1680. She interprets the decision to abandon glaze paint decoration, the standardization of exterior design layouts, and the predominance of feather motifs as intentional efforts to break with Spanish-influenced practices and (re)establish Zuni identity through a common ceramic tradition.

This example points out not only the mutability of material culture, particularly ceramics, in expressing and reinforcing identity, it also points out that practices are eminently historical. The range and form of future dispositions are limited and structured by prior dispositions and strategies, which are the result of even earlier states. As historical processes, explanations for social forms, for the creation of individual and group identity and their material expressions, must be made with reference to a "genealogy of practices" (Pauketat 2001:73). As abstract historical entities, practices need to be understood with reference to the particular contexts in which they develop and are deployed. Likewise, the recursive effect of practice of future dispositions, and the consequent developmental trajectory of social, political, and cultural institutions must be understood in local context. This does not mean, however, that explanations of change are made without reference to larger processes.

The generation of novel strategies for coping with the day-to-day exigencies and longer-term processes of human social life, the structuring effect of previous states on future possibilities for action, and the unintended social and political changes that may occur, are the cumulative results of human decision-making and the evolved capacity for culture. Given this, the approach to material culture change outlined here is, perhaps, analogous to Evolutionary Ecology, to the degree that the practices deployed and selected for are not necessarily the most optimal, but instead represent a compromise between multiple competing intrinsic and extrinsic constraints. Taken further, the ramifying effects of human decision making to meet short-term goals, the need to maximize return across a variety of fields, and the long-term effects of these decisions on future states, is at its center, an evolutionary approach to culture.

RED QUEENS AND AN ECOLOGY OF PRACTICES

Kuhn (2004:563–564) has stated that the potential falisfiability of many evolutionary models makes them easy targets for studies aiming to reveal the social, symbolic, or historical causes for variation in human behavior. The reason for this lies in the fact that one can easily make *a priori* arguments that a technology does not follow ecological or climatic gradient. In contrast it is impossible, or nearly so, to demonstrate *a priori* that past actions were something other than the result of historically contingent cultural constructions. Many studies attempting to demonstrate the inadequacy of evolutionary models or the utility of social or symbolic causes for technological change begin with a dismissal of potential economic explanations and then proceed to explanations highlighting the uniqueness of the material changes involved. There are numerous reasons why this occurs, not the least of which are the personal and intellectual biases of individual analysts (what Kuhn et al. [2004:558] refers to as *"core beliefs")* regarding what constitutes the proper locus of archaeological inquiry.

The space devoted to Social Constructionism above would suggest that this is the case here. However, I do not dispute the value of other approaches to the archaeological record. Rather, I believe that decisions regarding the kind of analytical approach to take are determined tby the nature and scale of the phenomena under investigation. This, in turn, determines the kinds of questions we ask. Given a major change in human adaptation that takes place over hundreds or thousands of years, such as the evolution of agriculture, a gradualist, Darwinian explanation may be the most appropriate. Even less profound changes in human material systems may be satisfactorily explained by Darwinian processes if they occur over evolutionary time – the gradual change in projectile point morphology in the American Southeast over a 800-year period is an excellent example (O'Brien et al. 2001, see also O'Brien and Lyman 2002) as are the changes in Great Basin hunting technologies occurring over a 400-year period (Bettinger and Eerkens 1999). However, changes taking place over much shorter periods of time and that are unlikely to leave archaeologically detectable traces of differential reproduction in human populations require other kinds of explanations. These changes may be explicable in an evolutionary framework, but require a wider understanding of what it is that is evolving, and the processes involved.

I suggest that a metaphor drawn from Evolutionary Ecology, that of the Red Queen Race (Van Valen 1973), can be applied to material culture change and integrated with the Social Constructionism as described above to develop an *ecology of practices* relevant to the evolution of material systems and technological innovation. Coevolution, competition for limited resources, and the recursive effects of phenotypic variation on ecological conditions and in eliciting new phenotypic variations are key elements of ecological thought. The conjunction of these elements results in a Red Queen race.

The defining metaphor of the Red Queen race is that of the arms race – that an adaptation in one lineage may give rise to a counter–adaptation in another. In such contests, contestants are constantly escalating the means of competition in reaction to the activities and practices of their nearest competitors (Maynard Smith 1976; Van Valen 1973). These competitions drive mutual processes of evolution – coevolution – between competing species. Generally, a Red Queen dynamic can be described as a state of continuous evolutionary changes not tending to an equilibrium state (Marrow et al. 1992; Stenseth and Maynard Smith 1984). The distributions characterizing behavioral variation resulting from Red Queen dynamics often resemble the "battleship" curves that are a common result of archaeological seriations. Such curves are described by Selectionists as evidence of "stylistic" rather than functional variation (Lipo et al. 1997; O'Brien and Holland 1992; O'Brien and Lyman 2000) and thus represent behaviors that are not amenable to empirical analysis. If, however, changes in material culture having a stochastic distribution through time can be understood as occurring within a Red Queen environment, then the those changes maybe the result of evolutionary processes, albeit ones different from those emphasized by Selectionists.

Dawkins and Krebs (1979) describe several types of competitions resulting in the kind of "arms race" considered here. Specifically they describe both inter- and intra-species competitions that can be both symmetric and asymmetric. Asymmetric competitions are those most commonly associated with predator-prey relationships, or more generally, with what they term, "attack-defence arms race" (Dawkins and Krebs 1979:491). Symmetric competitions are between individuals, normally of the same species, who are in competition for the same resource, and who are becoming better and better at doing the same thing. Of the two, symmetric competitions are, perhaps, the most relevant to the case at hand. In the natural world, examples of symmetric competition include competition between members of the same species to avoid predators (e.g. the evolution of protective coloring) or male-male competition to attract mates.

In considering human societies, what differs is the subject of competition. While animal species may be competing for access to food or mates and evolving increasingly efficient means for extracting or obtaining these resources, elements within human societies at all scales are in competition for more subtle commodities impacting, or manifesting as identity, status, and class. Though the ultimate outcome of these competitions in both the natural and cultural worlds may be differential reproductive success, in human societies, the short-term outcome of these competitions may be manifested as the successful reproduction and continuity of social and political structures and their attendant material expressions. I suggest that the practices defining the culturally competent manufacture and use of material culture and the implied possession of certain social, cultural, and ideological capital are outward expression of identity, status, and class that may be considered analogous to phenotypes. As such, they are the most obvious expressions of individual and group adaptations to larger social and political currents. The deployment and modification of these phenotypes in social contests and their modification in response to changing circumstances is evolution, though not of the biological or genetic sort.

Ecology is more than an environment and the plant and animal species contained within. Ecology is better defined as the *interactions* of the species present with each other and the environment. Behavioral or other changes in one species necessarily effect changes in another, altering ecological conditions. In this sense, phenotypes are historical entities, with past ecological conditions and behavioral dispositions structuring the range and expression of future phenotypes, though in an often unpredictable way. This is analogous to the recursive effect of practices on future dispositions, and their consequent effect on the developmental trajectory of social, political, and cultural traditions.

I present this discussion here as a means for structuring and interpreting in a general way the material culture changes described in this dissertation. I do not wish to overextend the metaphor, nor do I intend to reify abstract practices and structures. However, I do believe that practices may find material expression and that they may be reflected in the archaeological record. The archaeological record is, above all, a record of change, and archaeological theory, however constructed, should address that fundamental characteristic. Though the long-term outcome of evolutionary processes may ultimately impact human reproductive success and the reproduction of artifact styles or technologies, explanations dependent on these processes are impractical given the relatively short period of time over which many of the observed changes in archaeological record occur, particularly when dealing with classes of material culture that may be subject to very rapid changes such as ceramics. As a result, our explanatory efforts must be directed toward understanding the short-term consequences of these processes, their material manifestations, and their effects on cultural forms.

THE ORGANIZATION OF THIS STUDY

This dissertation extends the metaphor presented above, taking the Late Classic ceramics of Piedras Negras as a case study. The first half of Chapter Two describes, in general terms, the study of style in archaeology and its intersection with studies of technology, linking crafting, the possession of cultural goods and processes of political legitimation to processes of material culture change. The second half of Chapter 2 further develops these ideas, using the Classic Maya as a case study and focusing on processes of inter-elite competition and craft production. Craft production may have been integral to elite identity, while the organization of elite craft production provided an ideal social space for experimentation and innovation.

The rich archaeological and epigraphic record from the Classic Maya site of Piedras Negras, Guatemala provides an excellent context in which to study processes of technological and stylistic change. The distribution of resist and resist–reserve ceramics, as well as changes occurring in a number of other material classes, are embedded in the social and historical processes affecting the site between the late sixth and early seventh century and represent unique, material expressions of elite identity.

Chapters Three through Five present the methodological, archaeological and historical background necessary for understanding the course of ceramic change at Piedras Negras. Chapter Three reviews prior ceramic research at Piedras Negras and presents the result of the recent analysis. Robert Rands (1973) and later George Holley (1983, 1986, 1987) published overviews of the ceramics recovered from Piedras Negras by the University of Pennsylvania during the 1930s. Holley's (1983) treatment of the ceramics was the first published type:variety classification of those materials and one of the only extant ceramic typologies available for the Usumacinta drainage.

The results of the current research, including a revised ceramic chronology, are presented in Chapter Four. This research is based on a sample recovered by the BYU-Del

Valle excavations between 1997 ands 2000 (Forsythe and Hruby 1997; Muñoz 1999, 2001a, 2001b, 2003; Muñoz and Fitzsimmons 1998). These excavations were more extensive and more carefully documented than prior work, and the resulting ceramic sample is much larger and much better provenienced than the sample recovered by the University Museum Project. Major changes to the chronology include the addition of Middle, Late, and Terminal Preclassic ceramic phases, and a revised Late Classic chronology incorporating recent data concerning the origin and spread of Chablekal Fine Gray ceramics. This research also resulted in a complete revision of the type-variety catalog for the site's ceramics.

The historical substrate of the changes occurring in the ceramics of Piedras Negras in the sixth and seventh centuries is the subject of Chapter Five. The ceramic changes occurring at Piedras Negras were only some of a series of changes occurring in a number of other material classes including monumental art and architecture. These changes evident in architecture and monumental art were embedded in the sociopolitical events affecting the whole of the Maya Lowlands. These changes included the withdrawal of Teotihuacán from the Maya Lowlands as well as the escalating hostilities between Tikal and Calakmul between about A.D. 550 and 650. These events, though distant from Piedras Negras, did have immediate and local effects. The changes are most visible in the monumental art and architecture of Piedras Negras, and reflected in changing ceramic styles.

These changes in the ceramics of Piedras Negras must be seen as part of a single, though not necessarily unitary, strategy for creating and maintaining social and political identities as the elite and commoners of Piedras Negras tried to cope with the new social and political circumstances affecting the Maya Lowlands. At the most visible scales, these attempts to create new identities were manifested through the creation of new monumental and architectural programs signaling a new political order. At a lesser scale the creation of a new ceramic style may have served initially as a marker of elite identity and status, but quickly became a tool for contesting those identities as the style was replicated at successively smaller social scales.

Chapter Six reviews the archaeological evidence regarding appearance of resist decorated ceramics at Piedras Negras. The timing and distribution of resist decorated ceramics suggest that they may have been the products of specialists potting exclusively, or nearly so, for the highest member of Piedras Negras society. The earliest iterations of resist decorated ceramics are found in termination deposits marking the intentional destruction of architecture prior to episodes of rebuilding. The termination took place in restricted settings and would have required the presence of numerous individuals. The artifacts found in these terminations suggest an elite audience, while the nature of the deposits suggests that terminations may have provided an opportunity for elites to engage in competitive acts of conspicuous consumption. The need for novel displays of wealth and status in these venues led to the development of novel decorative technologies.

After about A.D. 680, resist decorated ceramics are found at all levels of settlement and in all sectors of the site. The shift in the distribution of the ceramics, in combination with their increasing frequency (resist-decorated ceramics come to dominate the polychrome assemblage of Piedras Negras) suggests a process whereby a class of ceramics originally defined by their rarity, locus of production, and technology as high-status were transformed into everyday possessions, held by the majority, and widely produced for economic gain.

This suggests several hypotheses testable through measures of standardization. The results of these analyses are presented in the Chapter Seven. In short, the ceramics found in the most elite contexts are expected to have been the products of a few specialists working almost exclusively for the most elite members of Piedras Negras society. The later materials were likely produced by a larger number of artisans whose products were distributed much more widely. In general, this shift should result in a lower labor investment, more variability in paste composition, a reduction in decorative variability, and other change vessel morphology related to changing production organization.

The implications of this study for understanding processes of stylistic and technological change, both in the Maya Lowlands and more generally, are the subject of the final chapter. In the absence of major techno-functional innovation, the creation of new ceramic styles represent artistic expressions that, because of their loci of production, the status of the producers, and the status of the consumers, were imbued with symbolic and ideological qualities. The replication and imitation of these ceramics represents the recognition of the pottery's inalienable qualities and the creation of new aesthetic canons, indicating a subtle reorganization of definitions of art and expressions of status. A similar process can be seen the decision to adopt any number of technologies elsewhere, where the success or failure of an invention was less dependent on the ability of the object to fulfill some mundane task and more closely allied to its ability to fulfill a specific social needs.

Chapter 2

THE SOCIAL CONTEXT OF CERAMIC CHANGE

The ceramic diversification evident at Piedras Negras during the late sixth and seventh centuries was first a result of the particular historical and social circumstances affecting the site, and second and more broadly, a result of processes linking crafting and the possession of cultural goods to political legitimation. The changes in the monumental art and architecture of Piedras Negras that occurred during the period A.D. 550-680 were a result of the need for elites to distinguish themselves materially from their counterparts both within and without the site. These efforts were undertaken to stabilize political relationships disrupted by the sociopolitical events affecting Piedras Negras and the Maya Lowlands at the end of the sixth century A.D.

These changes represented unique, material expressions of elite identity. This same need for unique material expression was, in essence, the same problem for which the rapid, Late Classic ceramic diversification evident at Piedras Negras and across the Maya Lowlands was the solution. However, the changes evident in the art and architecture of Piedras Negras are fundamentally different from the ceramic changes taking place at the site in that these changes did not represent novel technologies. The same techniques of stone carving or construction applied to monuments and architecture from the Preclassic onward were utilized in the creation of Late Classic art and architecture, only the themes varied. At Piedras Negras the development of resist decorated ceramics was not simply an elaboration of existing techniques. Rather, it represented the invention of a novel decorative technology, one employed elsewhere in the Maya Lowlands, but nowhere as sophisticated or as elaborated as at Piedras Negras.

The development of this novel technology was situated in a particular historical context, but resulted from the social circumstances structuring ceramic, particularly elite ceramic, production at Piedras Negras. These social circumstances included the link between crafting and political legitimation and elite identity, the increasing pace of Late Classic competition both between and within polities, and the need for increasingly diverse material expressions of status. These topics are the bases of this chapter.

Elite production is the focus for several reasons. First, the elite focus is suggested by the context in which we see many of the earliest ceramic innovations. The earliest iterations of the ceramic styles that become diagnostic of a particular ceramic phase are found in elite contexts, indicating that the locus of innovation and the appropriate point of investigation for the ceramics studied in this dissertation are in the elite sector. Second, the organization of ceramic and other kinds of craft production are understood, if incompletely, from archaeological, epigraphic, and ethnohistoric data that illuminates production at the highest levels of society. In contrast, very little archaeological data and no epigraphic data exist describing the organization of non-elite craft production. The ethnohistoric record is somewhat more complete, but still lacks the detail necessary to adequately model most ancient Maya craft production.[5] While it seems likely that the

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[5] There are gaps in the data concerning elite craft production, but these are not as serious as those concerning non-elite craft production. For example, we do not know where pots were fired - whether this activity took place within royal or elite compounds, or if it took place at a remote location. Neither do we know the relationship between the potter responsible for forming and firing the pot, and the painter responsible for applying decoration.

processes discussed in this chapter and in this dissertation had analogs at all levels of society and in all manner of material culture, the nature of the available data force me to limit the scope of this study.

This chapter begins with a discussion of several related topics – the production organization leading to the creation of "cultural goods," which are goods with specific cultural meaning and ideological import, the relationship of cultural goods to "high culture" and the role of high culture in defining elite status. "High culture" is the specific domain of the "Inner Elite" (Baines and Yoffee 2000:17). Inner elites constitute a very small percentage of the total population, and constitute the cultural, administrative and executive core of a society. For the ancient Maya, the inner elites – the cultural, administrative and executive core – are best defined as the king and his court.[6]

The utility of cultural goods as status markers is not absolute. Rather, the creation of cultural goods is a dynamic process akin to an evolutionary Red Queen race. In such contests, contestants are constantly escalating the means of competition in reaction to the activities and practices of their nearest competitors, where competitors may be defined as members of differing classes or factions. In some cases, including possibly that of the Classic Maya, patron-client relationships may be created whose proximate goal is the production of artistic and other "high cultural" goods that may ultimately result in the invention of new technologies. In societies with no established scientific framework, these patron-client relationships may serve as a primary loci of technological

6 The use of "king" is intentional. There are a few queens who held the position of sovereign in Maya history, but they tended to hold power only in cases of dynastic disruption, or when there was no male heir. In these cases, particularly the latter, they were often supervised by a high-status but non-regal males until a suitable heir could be found.

development. This appears to have been the case in numerous Old World societies as well as Piedras Negras.

The ceramic changes visible at Piedras Negras during the sixth and seventh centuries first appear in ostensibly royal contexts, and did not arise from the elaboration of extant technologies. The close relationship that existed in the Maya region between artistic production and elite status – in some cases the artists responsible for some of the most iconographic Maya art were known to have been of royal descent – makes this production organization a suitable framework in which to examine the process of ceramic change at Piedras Negras.

Following this discussion is a review of the epigraphic, archaeological, and ethnohistoric data supporting a model for the organization of elite Maya craft production that emphasizes the production of cultural goods. Among the Maya the close association between artistic production and elite identity and the fluid relationships that likely existed between Classic Maya courtiers emphasized the production and consumption of cultural goods as means for establishing and maintaining status.

Artistic production was likely structured through systems of patron-client relationships. These relationships are visible, albeit imperfectly, in the hieroglyphic record of the Usumacinta Basin. Epigraphic data from the region demonstrates relationships not only between the head of the Piedras Negras polity and his subordinates, but also between artists and rulers. It is clear from the inscriptions that artists were occasionally “gifted” to subordinate lords to carve monuments or create other artistic works. This is analogous to practices seen in the courts of Renaissance Italy and Han

China. If these examples of patron-client relationships can serve as analogs for understanding similar relationships among the Classic Maya, we are then afforded some insight into the functioning of patron-client relationships within the ancient Maya court and the impact of these relationships on the course of ceramic change.

Cultural Goods, Status, and Technological Innovation

I begin with the assertion that social classes are in constant competition to delineate their differences, and that this competition is nowhere more visible than in the field of consumption. The consumption of cultural goods, commodities with specific cultural meaning or social value, is predisposed to legitimize social differences (Bourdieu 1984:6–7; Sahlins 1994). The social, economic, and aesthetic value assigned an object may vary not only according to the materials and labor invested in its production, but also based on the status of the consumers and producers (Appadurai 1986:40). For example, Rowlands (1987:61) points out that the labor of common potters, woodcarvers, and smiths was perceived to be of a higher quality when the goods they produce are manufactured for a specific consumer audience of high-status: the residents of the royal compound. In other words, craft goods take on greater social or symbolic meaning when intended for consumption by celebrated members of society. Furthermore, the social status of a craftsperson may also endow craft commodities with an inalienable quality suffusing the object with particular social and symbolic meaning partly deriving from the specialized knowledge necessary for the production of the object (Mills 2004; Weiner 1985). These objects, whether recently manufactured or heirlooms, serve as markers of status and identity, communicating individuals and groups differences (Myers 2004).

This is particularly evident in those societies, such as the Classic Maya, where talented artisans are believed to be associated with, or blessed by, deities. The goods produced by these artisans are typically considered to have some connection with the supernatural, potentially making them effective political symbols. By engaging in or sponsoring craft production, high-status individuals are controlling the production of these symbols of sacred power, thereby providing proof of their exalted status (Stein 1996; Wattenamaker 1996). Thus, the production of craft goods by highly placed individuals may often be less of an economic activity than a political and ideological pursuit (Helms 1993; Mauss 1925; Terrio 1996; Weiner 1992).

Embedded specialists (Ames 1995; Janusek 1999), as a class of craft specialist, have particular relevance in this regard. Embedded specialists both contribute to, and control production of, items destined for elite consumption and, may themselves, be members of the elite. Abundant cross-cultural ethnographic and ethnoarchaeological data exists for embedded production, as well as for the production of specialized goods implied by this model (Brumfiel and Fox 1994; Clark and Blake 1990; Clark and Parry 1994; Hayden 1998; Pool 1992). While the production of these goods may have carried with it some economic benefit, these benefits were downplayed in favor of prestige or artistic celebrity (Helms 1993; Stein 1996). More importantly, the work of embedded specialists was necessary to the social reproduction of the elite household, not as dependents of elite individuals, but as part of their roles as artisans and elite individuals.

Embedded specialists may be either attached or independent specialists. Inomata (2001) has argued that “universalist” terms such as “independent” and “attached” specialization are best understood with regard to the disposition of the goods produced by these specialists, rather than by their relationship, economic or otherwise, to members of the larger society. Inomata (following Clark and Parry 1994, and Clark 1995) defines independent specialists in this way, specifying their rights of alienation over the products of their labor. Attached specialists, in contrast, do not have any such rights. In the case of the embedded specialists, particularly as they are discussed here, rights of alienation are situational. Embedded specialists may be commissioned to create a particular work, in which case they have rights over the product of their labor. In other cases, embedded specialists may engage in craft production to produce goods or gifts for use in social competitions to enhance personal status. In the same way independent specialization may grade imperceptibly into attached specialization, a similar diversity of positions exists for the relations between embedded specialists and the goods they produce.

Goods produced under systems of embedded specialization may be imbued with the status and identities of their producers and owners, endowing the object with particular, inalienable properties (Mauss 1925; Terrio 1996). This is the case particularly in those societies where talented artisans are believed to be associated with or blessed by deities. The goods produced by these artisans may also be considered to have some connection with the supernatural, making them particularly effective political symbols. By supporting craft production, patrons of embedded specialists are effectively controlling symbols of supernatural and sacred power and demonstrating their own access to such power, thereby providing proof of their own status (Wattenamaker 1996).

The presence of embedded specialists within an elite household suggests conditions of "restricted production" (Bourdieu 1984:230–231, 1993:39), a situation fostering the creation of "high art" with its particular cultural and ideological meanings. The very logic of restricted production, particularly the disavowal of economic profit in favor of prestige or artistic celebrity, makes it conducive to formal experimentation and innovation (Bourdieu 1984:39-40). If the organization of some craft production in the Maya Lowlands can be characterized as restricted production, this suggests a possible avenue for modeling the process of material culture change.

It is important to note that the disavowal of economic benefit among embedded producers, like the distinction between attached and independent specialization, may be situational. Embedded specialists may sometimes choose to engage in production that carries some economic benefit, while at other times, as clients to other elites, they may engage in production benefiting the status of their patron as well as themselves. In the second case, economic benefit may result, but it is the result of long-term strategy and the calculus of social power, rather than the immediate result of sale.

Elite Status and the Consumption of Cultural Goods

The term “elite” can serve first as a description for that segment of society exercising managerial control over society’s political, economic, and social institutions (Chase and Chase 1992; Marcus 1983). In this case, “managerial” refers to control over the means of production. This definition parallels more standard notions of class as a socially constructed category whose foundations, from a Marxist perspective, are based on the control of and access to the means of production – economic, ideological, and social. Additionally, the term elite is often used as an objective means for identifying a materially visible segment of society defined by its privileged access to wealth, including rare or exotic goods; for the Ancient Maya these included jade, quetzal feathers, cacao, stingray spines, and *Spondylus* shells. Thus, elites are defined primarily by their wealth and their ability to procure objectively defined material indicators of wealth. This definition implies no notion of control over production; rather it suggests only the economic and, less obviously, the social power to acquire.

Because status is most often manifested archaeologically by the differential distribution of materials conveying wealth or status, it is not possible to identify elites apart from their economic position, that is apart from their ability to extract surplus from the population. Though this is most often the tack taken in identifying elites, wealth does not necessarily correlate one-to-one with status or class (Costin and Earl 1989). Given this, the relationship between wealth and status is perhaps better cast as unequal access to labor and key resources resulting in the unequal distribution of specifically social power (Brumfiel 2000). The use of the term "unequal" leaves open the scale and degree of control over labor, only specifying that some degree of control, however sporadic and indirect, could be exercised over a segment of the population. Furthermore, if we include in this definition some notion of social power, then elite can be defined as denoting a culturally and historically constructed identity occupying a particular social space defined by economic, social, and cultural capital (Bourdieu 1984; Ortner 1998).

Cultural capital would seem an indivisible component of what Baines and Yoffee have termed "High Culture" (Baines and Yoffee 1998:233). High Culture is foremost an expression of cultural ideals, a "value laden stylistic complex that transmits the stylistic tradition and fundamental values crucial to the transmission of a culture's essence through time" through the production and consumption of aesthetic items (Baines and Yoffee 1998:235). Cultural capital is shorthand for that body of knowledge, esoteric and practical, necessary for the definition, production and consumption of cultural goods, that is commodities with specific cultural meaning and social value that serve to express and transmit those ideals defining high culture. The consumption of cultural goods is predisposed to legitimize social differences (Bourdieu 1984:6–7; Sahlins 1994) and it is within the field of consumption that we are able to observe the competition by which individuals or corporate groups among those typically defined as elites sought to differentiate themselves from one another and to increase their status vis-à-vis other members of the same class.

Through the display of significant political or religious symbols (DeMarrais et al. 1996; Pauketat and Emerson 1991; Pauketat 1997; Sterner 1989) or through more subtle characteristics such as shape, color, and design, material culture communicates socially significant messages expressing a particular organization of production and its attendant social relations (Costin and Earle 1989; David et al. 1988; Dobres and Hoffman 1999; Douglas and Isherwood 1979; Sterner 1989). These messages serve to legitimatize or contest status distinctions, enhance group solidarity and define and reinforce other social boundaries.

The question of whom the communications of order and legitimacy are addressed is crucial. Because comprehension of the content and context of many high cultural products requires a deep immersion in their genres (Baines and Yoffee 2000:16), High Culture is, by definition, exclusionary and self–referential. The ability to interpret and participate in High Culture is the result of immersion in a particular social milieu. High Culture as the "production and consumption of aesthetic items" requires the possession of a particular body of knowledge or cultural competency for culturally appropriate consumption as well as manufacture. Though cultural competency - the ability to appreciate and use high cultural goods in an appropriate manner - may be necessary to fully comprehend the context and content of high cultural products, a fairly low-level of competence is required to understand these products as powerful symbols of class and status.

Though high cultural products may be publicly visible, this does not mean that the symbolic message carried is intelligible to the wider population. In this sense, the high cultural objects is still exclusionary and carries a message decipherable only by members of the inner elite. However, others understand these objects as a general symbol of High Culture and its attendant political, social, and economic relations. As material manifestations of elite status high cultural products are subject to replication and emulation. This practice at once celebrates and legitimizes elite culture and the social divisions while at the same time blurring and subverting status distinctions. The result is an escalating race wherein the physical symbols of high culture are constantly being modified and transformed in an effort to maintain their exclusionary and legitimating functions. The production of high culture becomes a continual search for novel expressions of status as the meanings of status markers are co-opted and transformed.[7] It is important to point out that this is not a one-way process. In the same way that high culture may be transformed into everyday practices, pedestrian goods and practices may

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[7] This is by no means a one-way process. In the same way that high culture may be transformed into everyday practices, pedestrian goods may be co-opted by the elite and gain an exclusionary meaning.

be co-opted by the elite and gain and exclusionary meaning. For example, throughout the 19th and early 20th centuries opera, was a popular entertainment comparable to modern cinema. Within the last 75 years, opera has been transformed from an art form with both popular and elite audiences to the archetypal high-cultural event (Zelechow 1991).

Patrons, Clients, and High Culture

The condition of restricted production characterizing the creation of many cultural goods and the ideological and cultural meaning inherent in this mode of production provides an opportunity for embedded artisans to engage in practices enhancing their own standing as well as the standing of their patrons. Of particular interest here are competitions within courts and between courtiers involving the conspicuous consumption of cultural goods as they strove for prominence in local social hierarchies. A court is defined in this context as the, "sovereign and individuals who surround this high personage" (Inomata and Houston 2001:3). The critical element of this definition is physical proximity, not shared residence. Thus, members of the court were those individuals who may or may not have resided in the palace but who, nevertheless, could claim some level of interaction with the sovereign. However, not all those who could claim some interaction with the sovereign could claim elite status, and not all courtiers were of equal standing. Courts included not only members of the royal family, but also high-status functionaries, artisans, and members who were of more humble origins.

In many cases it is unlikely that the status of courtiers, whether ascribed or achieved, was clearly defined by sumptuary laws or formal regulations. Rather, while there were likely general limits to individual social mobility and some regulation regarding individual comportment in meetings with those of higher or lower social status, relations between individuals tended to be fluid and subject to manipulation and modification through either favor or challenges to the status of other individuals (Inomata and Houston 2001:11; see also Elias 1983).

Artisans, scientists, philosophers and other courtiers not involved in the bureaucracy of government and charged with producing items for elite consumption may be considered embedded producers. These individuals exercised occasional rights of alienation over the products of the labor, but their livelihood was ultimately in the hands of their patrons. The social space of the court, however, was not structured only by social relations. The ability to engage in court life through knowledge of court etiquette and polite discourse, as well as the ability to produce esoteric knowledge, was integral to elite identity and the status and power of courtiers. As members of the court, artisans responsible for the production of commissioned works were accorded a status that varied with the facility with which they could produce items suited to the pursuits of sovereigns and other courtiers, including themselves, and their capacity for the proper presentation of these works to their patrons (Biagioli 1993:19–23, 1990; Westfall 1985). The status of client artisans and intellectuals did not exist outside the social relations of the court; rather it was structured by the relations and practices of the court, and influenced the content of works produced. Framed this way, embedded producers are engaged in the creation of cultural goods. These goods are tied to the status of the patron and influence the status and social position of the client artisan.

In seventeenth century China, a clear distinction was drawn between *t'u* and *hua*.

The former, roughly translated as “picture,” referred to the depictions of actual peoples, places, and events and were considered to be, at best, as vulgar forms of art. “To insist on a specific subject or the representation or some event is very low class” (Kung Hsien, in Chu-tsing and Cahill 1989:8). Painting in this style typically resulted from commercial transactions in which the artist was commissioned to paint a subject specified by the customer. Such works were the products of professional painters who rarely received the distinction accorded to artists whose works could best be classed as *hua*.

Hua were works referencing actual places and times, but were more imaginary than iconic. Style and personal expression were paramount, and it was believed that *hua* was the work of artists who used “a good brush and antique ink and executes it on a piece of old paper” (Kung Hsien, in Chu-tsing and Cahill 1989:8). Artists painting for court officials or high-ranking bureaucrats were expected to produce works which were within this genre and suited to the elevated tastes of their audience (Figure 2.1). Furthermore, artists working in this genre rarely received compensation for their work; rather, paintings were given as gifts either to repay some prior obligation or to incur a reciprocal obligation. In this manner, artists retained their “amateur” standing, avoiding the taint of commercialism and emphasizing the aesthetic and intellectual qualities of their work (Chu-tsing and Cahill 1989:16–17; Murray 1989:28–30). The emphasis on these qualities of painting was well-suited to the Chinese court where cultural continuity and control over traditional culture was key to the legitimation of authority (Chung–tsing 1989:5; Murray 1989:28–30).

Figure 2.1 An example of *hua.* This landscape was painted by the seventh century master Wang Hui (1632-1717). This painting, executed in 1674, exemplifies Wang Hui's "systematic synthesis of earlier styles through the careful study and reinterpretation of ancient paintings" (2002 Catalog, Metropolitan Museum Exhibit "When the Manchus Ruled China: Painting under the Qing Dynasty [1644–1911]).

The needs of the Chinese court dictated aesthetics and defined "artists" as disinterested intellectuals whose reputation was based on the status of their patrons as well as on their control of canonical forms. The needs of the court structured the identity of artists, and artists in turn produced art that reflected the needs and ideals of the court. An artist's control of technique, style and subject matter insured access to higher-ranking patrons, and elevated status and privilege for the artist. In a reciprocal process, patrons capable entering into client relations with high-status artists were able to improve their own standing in society – both through the appropriate consumption of these cultural goods, and by incurring social debt by gifting these works to others.[8]

A similar situation prevailed in seventeenth and eighteenth century Europe. At this point in European history, systems of patronage were the primary sources of institutional support for artists, poets, natural philosophers, mathematicians, and others engaged in similarly esoteric or aesthetic pursuits. Though the livelihood of these individuals depended heavily on the favor of their patron, their economic success was dependent on the status they were able to accrue for themselves and their patrons through the production of unique artistic and intellectual goods. Galileo's gift of stars to the Medici court is illustrative.

Near the end of November 1609, Galileo turned a telescope that he had built toward Jupiter. The telescope contained optics that were far better than the optics found in other telescopes and with these he was able to observe, for the first time, four moons orbiting the planet. Galileo, realizing the importance of his discovery, immediately wrote the Medici court announcing his discovery and his desire to name these "stars" after the Medici family. Galileo published his findings in the *Siderus Nuncius*, which he dedicated to Cosimo Medici and his brothers, naming the four moons of Jupiter the Medician Stars (Figure 2.2).

Galileo's gifts to the Medici court in Renaissance Italy were conditioned by his own talents and by the prevailing social and cultural milieu. The discovery of the Medician

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[8] Like societies elsewhere in the world where patronage relationships determined social interaction, there were strict rules governing when and how potential patrons and clients could be approached, especially when differentials in status existed. Chu-tsing and Cahill (1989:17) provides several examples, perhaps apocryphal, in which artists refused to accept commissions for painting because they were inappropriate to the artists' status or had been ineptly offered.

Stars was not in any sense a natural or inevitable discovery. Letters written by Galileo indicate that he had not decided on a serious program of investigation following his improvements to the telescope; rather he appears to have focused almost exclusively on the telescopes' ability to insure his own future (Biagioli 1990,1993; Westfall 1985). Galileo's discovery of the four moons of Jupiter, the refinements of telescope optics that made this discovery possible, and his decision to name them after the Medici family were framed in terms of his aspiring role as a client to the Medici court. Through this transaction he secured a larger annual stipend, accrued a measure of prestige for both himself and Cosimo Medici, and insured his clientage to the Medici Court.

In the same way that artistic refinement and control of canonical styles created a legitimating continuity with the past for both the Chinese artists and patrons, Galileo was able to weave his "scientific" discoveries into a legitimating narrative useful for guaranteeing Medici rule by elaborating an extant mythology linking that family to Jupiter.[9] The four moons discovered by Galileo were equated with the four brothers heading the Medici family – a fact that was recorded in murals decorating the interior of the Medici palace in Florence, commemorated on special coins struck to mark the occasion of the discovery, and became the subject of public spectacle celebrating the discovery of the stars and the role of the Medici family in bringing cosmic order to Tuscany.

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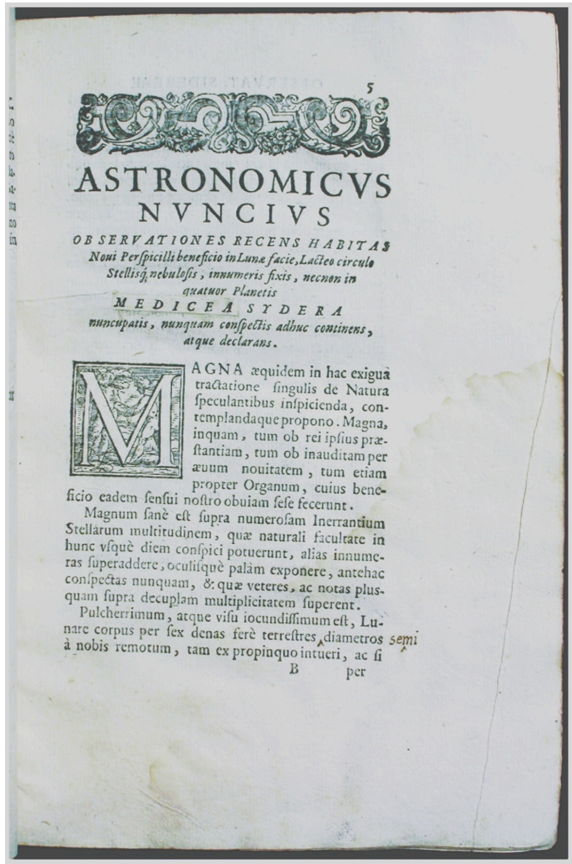
[9] Scientific is used here in quotation marks because the ideas of science and the scientific method were the result of a long developmental process that began with the Italian Renaissance. At the time that Galileo was working, there was no framework, institutional or otherwise, for doing science, and science was not necessarily from other fields of inquiry - it was simply an aspect of natural philosophy that involved mechanical and technical work rather than reason logical argument.


5

ASTRONOMICVS
NVNCIVS
OBSERVATIONES RECENS HABITAS Noui Perſpicilli beneficio in Lunæ facie, Lacteo circulo Stelliſq; nebuloſis, innumeris fixis, necnon in quatuor Planetis MEDICEA SYDERA nuncupatis, nunquam conſpectis adhuc continens, atque declarans.

MAGNA æquidem in hac exigua tractatione ſingulis de Natura ſpeculantibus inſpicienda, contemplandaque propono. Magna, inquam, tum ob rei ipſius præſtantiam, tum ob inauditam per æuum nouitatem, tum etiam propter Organum, cuius beneficio eadem ſenſui noſtro obuiam ſeſe fecerunt.

Magnum ſanè eſt ſupra numeroſam Inerrantium Stellarum multitudinem, quæ naturali facultate in hunc vſquè diem conſpici potuerunt, alias innumeras ſuperaddere, oculiſquè palàm exponere, antehac conſpectas nunquam, & quæ veteres, ac notas plusquam ſupra decuplam multiplicitatem ſuperent.

Pulcherrimum, atque viſu iocundiſſimum eſt, Lunare corpus per ſex denas ferè terreſtres diametros semi à nobis remotum, tam ex propinquo intueri, ac ſi

B per

Figure 2.2 Frontispiece, Galileo's Siderus Nuncius. The dedication reads, "Serenissimo Grand Duke, scarcely have the immortal graces of your soul begun to shine forth on earth than bright stars offer themselves in the heavens, which tongues [longer lived than poets] will speak of and celebrate your most excellent virtues for all time" (Westfall 1985:18).

Though the artisans embedded within the Maya court may not have had the economic freedom of a Renaissance inventor, they were charged with similar responsibilities – the production of material and intellectual goods that could function within and between courts as capital deployable in social contests where the medium of competition was the production and consumption of cultural goods, and the stakes were political and social power. At many places in the Maya area, royal patrons may have followed a pattern similar to that described for China – the increasing technical and artistic refinement to reach a level of aesthetic perfection. A Piedras Negras, however, the historical and social factors affecting the site and the region in the late fifth and early sixth centuries A.D. resulted in a pattern that differed significantly from sites elsewhere in the Lowlands.

PRODUCTION, COMPETITION AND CULTURAL GOODS AMONG THE ANCIENT MAYA

Though they were far removed from early Historic China and Renaissance Italy, archaeological, epigraphic and ethnohistoric data suggests comparable systems of elite patronage and craft production existed among the ancient Maya. There is ample archaeological evidence for craft production at a number of different scales and levels of intensity in the Maya area. Production is most commonly organized around the household, with intensity ranging from part-time and seasonal, to year-round, full-time specialization (e.g. lithic production at Colha, Shafer and Hester 1983). Substantial evidence exists for the production or manufacture of jewelry (shell and jade), salt, lithics (obsidian and chert tools and eccentrics), lime, and metates (Adams 1970; Aldenderfer 1991a, 1991b; Andrews and Mock 2002; Becker 1973, 2003; Cook 1997; Freter 1996a; Haviland 1974; Healy et al. 1995; Lewis 1995; MacKinnon and May 1990; Mazzulo et al. 1994; McKillop 1995:89; Mock 1994; Moholy-Nagy 1997; Valdez and Mock 1991). The identification of these production specializations is based chiefly on the direct identification of production facilities or production debris. The lack of these kinds of data has hampered studies of Maya ceramic production, though ample evidence drawn from paste recipe, paste composition, and other modal analyses exists for inferring the organization of ceramic production (see Bill 1997; Foias 1996; Fry 1969, 1979, 1980; Rands and Bishop 1980).

Though patterns of ceramic manufacture varied over time and space, it seems clear that major centers were net consumers of ceramics, particularly utilitarian (unslipped) wares and less elaborate polychrome serving vessels. Fry (1979, 1980), for example, found that these classes of vessels were manufactured at a number of small centers located up to 8 km from central Tikal and exchanged via a complex, non-centralized, market system. Little evidence exists for inferring the production organization of the elaborate polychrome favored by the Maya nobility, but because this subject is of principal importance, the remainder of this section is devoted to modeling the production of these wares. Specifically, it is likely that these ceramics were manufactured under conditions of "restricted production" by embedded specialists and can be understood as artistic expressions endowed with particular symbolic and ideological qualities.

In addition to the production specializations named above, iconographic, epigraphic, and ethnohistoric data exist for a number of other occupational specializations including monument carvers, wood workers, musicians, bee-keepers and painters/scribes (Adams 1970; Becker 1973; Coe 1973, 1978; Coe and Kerr1998; Houston and Taube 2000; Inomata and Stiver 1998; Inomata and Triadan 200; McLeod and Reents-Budet 1994; Reents-Budet 1987, 1998; Wallace and Carmack 1977). It is likely that only some of these professions were open to all members of Maya society while others were restricted to specific segments of the population. This is particularly true for occupations like monument carver or scribe where the production of stelae or glyphic texts may have required a body of historical, mythological, ritual, or otherwise esoteric knowledge unavailable to the greater part of Maya society. In the case of scribes, or the painters responsible for creating the elaborate figural scenes or glyphic texts decorating polychrome vessels, this was almost certainly the case. Abundant archaeological, epigraphic, and iconographic evidence exists indicating that these individuals were members of the highest tiers of Maya society. If they were not nobles themselves, then they were certainly members of the royal court.

A parentage statement found on a looted vessel provides a clear indication of the royal nature of scribes. Reents (1987) describes three vessels executed in markedly different styles but all clearly the work of a single artist. One of the three vessels contains a hieroglyphic text containing the artists name as well as his parentage. The artist, now identified as Ah-Maxam, was a son of Lady (of) Yaxha and Lord Flint Face of Naranjo. No record exists of Ah-Maxam ever ruling at Naranjo or elsewhere and it seems likely that he was a second son, and not in line for the throne.

Comparable data is known from a number of other sources. For example, several of the "Fat Cacique" vessels looted from near the site of Motul de San Jose were painted by a single artist who bears an Ahaw title but is not known from other contexts (Macleod and Reents–Budet 1994:132–133). Other evidence includes a ceramic vessel in the shape of a halved conch shell excavated from the tomb of Hasaw K'an Kawil at Tikal and inscribed with a text indicating that it was a container for liquid. This vessel was presumably used for holding ink or paint and is very similar in shape to the inkpots held by scribes in Classic period depictions (Figure 2.3). Artists or scribes are also frequently depicted on the vessels themselves, typically in court scenes, and in close proximity to the ruler, suggesting high-status (Houston and Taube 2000).

Figure 2.3 Evidence for the elevated status of Classic Maya scribes. (top) A scribe, identifiable by his headdress, is seated in front of a ruler; (lower left) A scribe holding a conch shell inkpot paints a codex; (lower right) A ceramic bowl in the form of conch shell inkpot from the tomb of Hasaw Kan K'awil of Tikal. (Top and lower left photograph from Kerr archive, available at www.famsi.org/research/kerr/index.html, Lower right photo from Reents [1994:43])

Finally, Fash (1992, see also Reents–Budet 1994:57) interprets a high-status burial found within Str. 10L–26 at Copan as that of a highly placed scribe or artist. The burial contained abundant offerings of jade ornaments, polychrome pottery, carved bone, and other goods typically associated with the highest tiers of Maya society. In addition to these goods, the burial also contained the desiccated remains of a codex and small ceramic vessels containing various kinds of pigment – evidence that the interred individual was possibly a scribe. The location of this building within the elite core of the city suggests a familial connection with the ruler who commissioned this building, either Buts' Chan K'awil (the twelfth Ruler of Copan) or his successor, Waxlakahun U'bah K'awil.

Abundant epigraphic and iconographic evidence exists linking Classic Maya artists to the supernatural or to specific patron deities. The best-known are the monkey patrons frequently associated with scribes. In some cases, scribes are even depicted as part human, part supernatural, a condition that Reents–Budet (1994:56) describes as denoting "supra–human" status. Very little is known about the association between supernaturals and artists among the late Preconquest Maya, though the extant data suggests that the beliefs of these Maya may not have been so different from their Classic era counterparts. The Madrid Codex, for example, contains depictions of supernaturals engaged in the production of masks, as well as writing and painting (Figure 2.4). A passage from the Relación de Valladolid states that Itzamna was the inventor of writing and of books, indicating a further link between crafting and the supernatural.

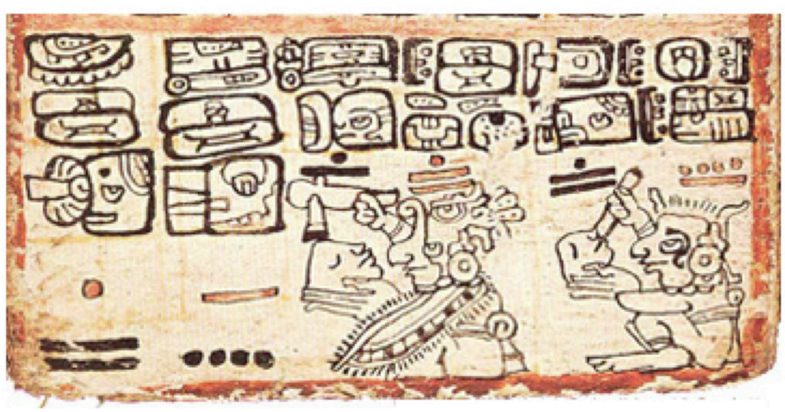


Figure 2.4 An Illustration of two supernaturals carving masks. Taken from the Madrid Codex. The Madrid contains descriptions of the rituals and divinities associated with each day of the 260-day Mesoamerican sacred calendar.

Ethnohistoric evidence from the Maya Highlands provides an analogy for the organization of Classic Maya courtly production. Wallace and Carmack (1977), note the existence of craftsmen attached directly to the royal court of Sixteenth century Utatlan. Ethnohistoric documents make it clear that there were specialized craftsmen within lordly lineages and that these craftsmen were the younger sons and kinsmen of highly-placed lords. These sons and kinsmen of nobles engaged in a wide variety of craft specialties including woodcarving, painting, feather work, and silversmithing. Wallace and Carmack indicate that some women courtiers also engaged in craft production, specializing in the manufacture of textiles. The goods produced by these craftsmen circulated only among the elite or noble classes and were not available to commoners. Finally, like the Classic Maya, Postclassic Maya artisans had supernatural patrons, the best known of which were the monkey deities, Hun Chuen and Hun Ahau (Coe 1977) (Figure 2.5). This model is similar to that suggested for the Classic Maya.

Figure 2.5 Classic period examples of the twin monkey deities, Hun Chuen and Hun Ahau, as scribes. Hun Chuen and Hun Ahau are typically described as the older brothers of the Hero Twins, Hunahpú and Xbalanqué. (Left, detail from Kerr 3413, available at www.famsi.org/research/kerr/index.html, Right, from Schele and Miller [1986:52]).

Archaeological data indicate that the production of craft goods intended for elite consumption took place within or very near elite residence. At Aguateca, Inomata (Inomata and Stiver 1998; Inomata and Triadan 2000) found within the "Scribes Quarters," Str. M8–10, evidence not only for scribal production (stone mortars for pigment preparation, conch shell inkpots, and a possible paint brush), but also evidence for the production of numerous other works of art including jade and shell beads and bone artifacts. This evidence included not only the tools possibly used in the manufacture of these items, but also completed specimens and production debris.

In addition to the evidence indicating scribal or artistic production, slipped serving vessels, unslipped utilitarian jars presumably used for food storage, manos and metates for grinding corn or other food stuffs, obsidian blades, spindle whorls, and bone needles were also found here. Inomata believes that this structure represents the combined residence and workshop of an artist attached to the court of Ruler 5 of Aguateca, and that the artist himself was of elite status. These results, made dramatic because of their excellent context, agree well with data from sites elsewhere in the Maya Lowlands where evidence for domestic craft production is less obvious.

Fash (1989, 1991) found similar, though less dramatic evidence suggestive of scribal production within an elite residence at Copan. Str. 9n–82 contained a stone bench supported by carved depictions of *Pawahtuns*. Pawahtun, the Classic period name for God N, is frequently associated with scribal or artistic production in Post Classic codices, and is often included in the titles carried by Classic Period scribes. The exterior façade of Str. 9n–82 is decorated with carved depictions of painters – the individuals depicted are shown holding paintbrushes and conch-shaped ink pots.

Aldenderfer (1991b), in a study of stone tools recovered from Yaxha, found that all of the tools thought to have been utilized for specialized craft production (lapidary or wood carving) were found only in elite contexts. In contrast, tools with a general function were found across all contexts. Again, this suggests that some specialized craft production may have been an elite activity taking place within elite residential compounds.

In summary, the archaeological, epigraphic, and iconographic data available for the ancient Maya as well as ethnohistoric data available for the late Preconquest and colonial Maya suggest conditions of embedded production as described by Ames (1995). Specifically, goods intended primarily for elite use either as personal adornment, display, or in other acts of conspicuous consumption, were manufactured by the elites themselves. This production was ideologically and symbolically charged through the association of artisans with patron deities and through the association of these the goods with the highest levels of Maya society. The production of craft commodities by specialists attached to the royal court was primarily an artistic or aesthetic endeavor likely done with little or no regard to economic profit and perhaps more for prestige or artistic celebrity.

The increasing pace of inter-elite competition during the mid-sixth and late seventh centuries and the need for increasingly diverse material expressions of status presented a primarily social problem which the artisans of Classic Maya society were well suited to address. The conditions of “restricted production” characterizing the manufacture of elite Maya art provided an ideal situation in which to seek resolution to the problems facing

Maya elites at this critical historical juncture – the increased need for tangible manifestations of individual wealth, power, and authority. The production organization for a wide range of goods, not least of which was pottery, encouraged experimentation and innovation. At Piedras Negras, this process was most visible in the production of elaborate ceramics for use by the highest members of Piedras Negras society.

Elite Competition Among the Classic Maya[10]

The previous section provided an outline of elite craft production and its relevance to the creation and maintenance of elite identity. In this section the functioning of the Maya court is discussed with an emphasis on inter-elite competition. While craft production may have been integral to elite identity, and the organization of elite craft production may have created a setting in which experimentation and innovation could take place, its existence alone was not sufficient to drive the kinds of changes apparent in the ceramics of Piedras Negras. Rather, the ceramic change was as much the result of the organization of production as it was the particular historical and social factors affecting Piedras Negras and sites elsewhere in the Maya Lowlands. Competitions among elites and between elites and other segments of society resulted in the need for increasingly diverse material expressions of status, among which the ceramic changes visible at Piedras Negras were one result.

In the Maya Lowlands, it is clear that competition between elites occurred at a variety of scales, from inter-polity conflicts that involved numerous sites, such as the

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[10] Portions of this section and the next were taken from an unpublished manuscript authored by Muñoz and Golden (2006). Thus research is presented in greater detail in Golden (2002).

long-running conflict between Calakmul and Tikal, to less visible but no less fierce conflicts between factions within a royal household. With regard to the first kind of conflict (inter-polity) there is a great deal of epigraphic evidence documenting warfare, prisoner sacrifice, and other kinds activities related to the violent expression of inter-polity competition. Archaeologically, the evidence for warfare is difficult to detect, though the occasional discovery of defensive earthworks or intentionally defaced monuments and buildings suggest that warfare occurred on a scale equal to the technologies and capabilities of the ancient Maya (Webster 2000).[11] Fortunately, conflicts of this sort are a central focus of many hieroglyphic texts, and we are thus left with a rich record of ancient political interaction.

Direct statements of warfare and capture, however, are only the most obvious signs of political competition. Competition must also have existed between sites subordinate to a single primate and, more importantly, between the elites of single sites as they struggled for preeminence in local hierarchies. Of particular interest here are the competitions that took place between members of a single court. In the Maya Lowlands textual references for these kinds of competitions exist, but they are rarely direct and provide only an incomplete picture of what must have been a very complicated political landscape. The Dos Pilas - Tikal conflict is perhaps the best-understood example of conflict within a

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[11] Much of Chapter Five is taken up with the discussion of this kind of conflict and its effects on the Maya Lowlands. In the Usumacinta Basin, the two regional powers, Yaxchilan and Piedras Negras, maintained an antagonistic relationship that spanned centuries, with each site ascendant over the other at various points in their history. At both Yaxchilan and Piedras Negras inscriptions record the capture and sacrifice of lords from sites subordinate to one or the other site. The final monument at Yaxchilan records the capture of Piedras Negras Ruler 7 in A.D. 808 (Stuart 1998). This was the last monument erected at either Yaxchilan or Piedras Negras and marked the end of both dynasties.

Maya court. Though the Dos Pilas dynasty headed an independent polity that maintained an antagonistic relationship with Tikal for most of its history, the origins of that dynasty most likely lay in the political intrigues of the Tikal Court. The details of this episode are not clear but it seems that the accession of Tikal ruler Nuun Ujol Chaak in A.D. 657 caused a political rift that forced B'alaj Chan K'awil, a noble from Tikal, to flee that city in A.D. 648 and found the site of Dos Pilas (Houston 1993).[12]

The political intrigues affecting the courts of Tikal and Dos Pilas are not unique and have parallels elsewhere in the Maya area (see Martin and Grube 2000 for an exhaustive review). The degree to which this conflict was recorded is rare, however, and results from the fact that it ultimately led to the creation of a new polity headed by a sovereign able to commission his own monuments. Political competitions, however, need not result in or take the form of violent conflicts, but instead may be played out in a variety of forms and media. The famous "Potlatch" of the U.S. Northwest Coast is perhaps one of the most

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[12] It is possible that Nuun Ujol Chaak was a descendent of the dynasty that had headed Tikal prior to that sites' catastrophic defeat by Caracol in A.D. 562. During the 95-year period following this episode (A.D. 562-A.D. 657), Tikal may have been ruled by a dynasty originating outside the site, perhaps Calakmul or Caracol. This is suggested by the fact that Animal Skull, the first known ruler to accede after the A.D. 562 defeat by Caracol, emphasized the pedigree of his mother, who is described as an "ix ajaw" (literally "Lady Lord") but gave minimal attention to his father, whom he only mentions once and without providing his title. This suggests that his mother was most likely a royal woman of Tikal and his father an usurper who took a local noble as his wife.

If Nuun Ujol Chaak were a descendent of the lineage that had exercised prior control of Tikal, this would have created a crisis for the foreign dynasty. It was perhaps just such a crises that motivated B'alaj Chan K'awil to flee Tikal. B'alaj Chan K'awil claimed a Tikal ruler as his father, and the polity of Dos Pilas incorporated elements of the Tikal emblem glyph into its own. However, throughout most of its history, the rulers of Dos Pilas described themselves as vassals of Calakmul. During B'alaj Chan K'awil life Calakmul attacked Tikal several times and Tikal retaliated by attacking Dos Pilas. At one point in this "civil war" (Houston 1993) B'alaj Chan K'awil and his family was forced to flee Dos Pilas, seeking refuge for a time at Calakmul (Martin and Grube 2000:58). It is likely that Dos Pilas second ruler, Itzamnaaj K'awil, was born at that site.

famous examples of this kind of competition, in which contest were waged via aggressive gifting and redistribution in the course of multi – day celebrations, rather than in ferocious meetings on the battlefield. Another, similar example of this kind of competition are the feasts described by Rappaport (1968). Though Rappaport describes these feasts in ecological terms, they had social import and played a major role in establishing position within New Guinea society. Brumfiel and Fox (1993) provide an illuminating study of factional competition, much of it non-violent, in the New World and its effects on the development of social inequality and chiefly authority.

The organization of elite Maya craft production provided an ideal setting in which non-violent and culturally sanctioned competitions could take place between individuals and groups, particularly between courtiers. Unfortunately, the hieroglyphic record of the Maya area provides little direct insight into the dynamics of these competitions, though there are subtle clues to the individual political strategies and more general processes as individuals and groups sought political power. Within the Usumacinta Basin, the distribution of titles, the gifting of the services of talented artisans, and the depictions of subordinates engaging in rituals with their sovereigns all provide clues into the dynamics of political competition and patron-client relations within Maya courts.

Patrons and Clients among the Classic Maya

By the seventh century the political processes begun in the sixth century had resulted in a patron-client relationship of the paramount ruler, the *k'uhul ajaw*, to the subordinate nobility. This relationship is evidenced in both epigraphic inscriptions and sculptural depiction. Late Classic texts reference persons with titles such as: *ajaw* ("lord"), *ch'ok ajaw* ("young lord"), *sajal* (perhaps "he who fears"), *a-k'uh-hu:n* (a scribal title), *y-ajaw-k'ak* ("the fire's lord"), as well as others. Ajaw and sajal title bearers might be further subdivided by the addition of the *ba-* ("head") prefix. Thus, individuals within a polity who were the head-sajal were ranked above all others holding the sajal title by itself (Houston and Stuart 2001).

In return for their services, sajal and other subsidiary nobility often received the benefits of status ascribed through textual and iconographic representation on monuments, carved by scribes whose work was controlled by, and the prerogative of, the ruler. These negotiated symbols of status were realized differently at different sites. At Palenque, for instance, the sajal Chak-Zutz′ is accorded his own epigraphic program within the site center emphasizing his inherited status, without reference to the paramount (Schele 1991; Villela 1993). At Copan, on the other hand, inscriptions associated with the residences of secondary elites are concerned with the interconnections of these subordinates to the *k'uhul ajaw* (Fash and Stuart 1991; Martin and Grube 2000; Villela 1993). In the Yaxchilán polity, subordinates such as sajal are depicted both at Yaxchilán proper and at subsidiary centers such as La Pasadita and Laxtunich, often in scenes depicting war captives (Golden 2003; Mathews 1988; Schele and Freidel 1990:295). They are most often depicted in subordinate positions to the k'uhul ajaw, and are never depicted individually within Yaxchilán itself.

Subordinate nobility within the Piedras Negras polity occupy a highly visible position in the monumental programs of Piedras Negras proper and its subsidiary centers. At the site of El Cayo, several monuments were commissioned by sajal subject to the rulers of Piedras Negras, and make textual references to participation in ceremonies with the paramount ruler of Piedras Negras. Furthermore, the monuments at El Cayo were carved by sculptors who were under the direct control of the rulers of Piedras Negras and responsible for monuments at the paramount center as well (Martin and Grube 2000:153; Schele 1991). Parrot Chaak, the ruler of the site of La Mar in the late eighth century A.D., is depicted on his own monuments as well as on Stela 12 from Piedras Negras, delivering captives as tribute to his overlord (Houston et al. 1998). He is also mentioned on Throne 1 from Piedras Negras, and is depicted as a child on Panel 3 (Martin and Grube 2000: 153). Panel 3 from Piedras Negras is, without a doubt, the most complex sculptural depiction of the idealized relationship of subordinate nobles with the k'uhul ajaw in a courtly setting. Sajal are arranged before the throne of Ruler 4 in rank order, with visiting ajaw and young lords of Piedras Negras arrayed in intermediary positions before the sovereign.

The incorporation of honored nobles into a historical record was not a passive act on the part of either ruler or subject. Participation with the ruler in activities of sociopolitical import, for example warfare, provided a fundamental source of prestige and political power for these subordinate nobility. Nobles acted as military allies and acquired captives for the k'uhul ajaw, who are depicted receiving such captives from their subordinates (Golden 2003; Houston and Stuart 2000; Schele and Matthews 1991). As such, these captives are essentially tribute, or gifts, made by a client to a patron in anticipation of reciprocity. In addition, sajal acted to guard the frontiers of the polity and help to regulate trade access. While inherited status was certainly a major factor in social ranking, it provided only the potential for participation in social behaviors that could result in ones inclusion in sculptural programs. It was performance that shaped the roles and privileges of titleholders (Houston and Stuart 2001; Inomata 2001).

Monuments, however, are only the most obvious products of such patron-client relationships among the Classic Maya. While the monuments present direct textual and iconographic references to noble clients and inter-elite competition, many aspects of the material record available to archaeologists may provide evidence for other kinds of patron-client relationships. Patron-client relationships take many forms, and these relationships are expressed in a wide variety of material culture. At Piedras Negras the rapid diversification of ceramics, particularly the appearance of resist-reserve decorated wares, between the sixth and seventh century A.D. may be an indication of these same processes, but at a more local level. More specifically, it seems likely that the appearance of resist-reserve pottery at Piedras Negras was a result of efforts on the part of some members of the Piedras Negras nobility to distinguish themselves materially from their elite counterparts both within and without the site. These efforts were expressed through the sponsorship of attached specialists potting exclusively for members of the royal court, and through the conspicuous consumption of these elite wares in competitive displays intended to advance personal standing.

The intent is not to suggest that the attached or embedded production of craft goods among the Maya had its origins at this time. Rather, it is more likely that attached production may have served as increasingly important demonstrations of the elite's power and authority. It is important to point out that many of the most famous ancient

Maya artisans known by name are titled and were undoubtedly members of the nobility. The presence of artists' names on monuments and polychrome vessels implies a certain celebrity, and it appears that the services of particular artists may have been in great demand and that a gift of a highly regarded artist's talent may have constituted a high honor. Such gifts may have functioned to bind subordinate sites to their sovereign. Several monuments at El Cayo, for example, were carved by sculptors from Piedras Negras (Martin and Grube 2000). The celebrity accruing to talented artists and the prestige afforded through their association with the highest levels of Maya society may also have served as a mechanism binding kinsman to the paramount, lessening opportunities for strife, and providing otherwise disenfranchised nobles with a degree of renown among their peers.

CONCLUSION

Though competition between courtiers was unlikely to result in a written record and only occasional archaeological traces, cross-cultural comparisons indicate that competitions for status between members of the court must have existed and, at times, must have been fierce. These competitions were played out in variety of forms and venues, but all had the same intention - the production and consumption of material and intellectual products serving to elevate the status of both producers and consumers. Either through conspicuous consumption or through more subtle practices, cultural goods legitimated status differences, transmitted high cultural ideals and legitimized social differences.

The analogy drawn from the Medici court in Renaissance Italy allows us some insight into the roles of royal patrons, the effects of patronage on the status of individuals and, most importantly, on the material outcomes of those contest. Status competitions for Europe's noble patrons motivated the recruitment of Europe's most prestigious natural philosophers and mathematicians. Because of the benefits accrued by clientage to a prestigious patron, competition among aspiring clients was equally intense and led to technological and scientific developments that may not have occurred otherwise.

The Medici court is illustrative in this regard. The technological and scientific advances made public in Galileo’s *Siderus Nuncius* were the result of an intentional effort by Galileo to curry favor with the court and improve his social and material conditions. This tells us as much about the practice science in conditions where no established scientific framework exists, as it does about the connection between scientific or, better, esoteric knowledge, and the creation and legitimation of high culture.

The credibility of material culture as high culture does not stem from the utility of that artifact in performing its mundane function. Rather, its legitimacy as high culture is closely connected to agents and their position with social networks whose ultimate currency is knowledge and power. In this sense, the two - power and knowledge - are indivisible elements of a single social phenomena made manifest in material culture and in the appropriate consumption of those materials. Galileo’s discovery of the Medicean stars would have been nearly meaningless, a scientific oddity, without the legitimacy conferred by the public consumption and celebration of that knowledge by the Medicis’. This act elevated Galileo socially and financially - at one point he was among the highest paid courtiers in all of Europe - and legitimated the rule of the Medicis, placing their rule solidly within the natural and universal.

In early historic China the same processes that led to technological innovation in Europe led to what Inomata (2001a, from Geertz 1963) has described as "involution". Court patronage, particularly that focused on the production and consumption of paintings, was not focused on the invention and elaboration of new techniques. Rather artistic development focused on aesthetic and technical refinement in an attempt to produce art that was "traditional" and closely linked to the notions of cultural continuity, historical legitimacy, and heavenly sanction necessary for the maintenance of power. The Chinese ruler Sung Kao-tsung, who came to power in A.D. 1127 after a period of severe political unrest, used his mastery of calligraphy and Confucian literature to demonstrate his control over traditional culture and Confucian morality. Copies of Confucius' works transcribed by Sung Kao-tsung were sent to prefectural schools where they served as powerful reminders of the ruler's control over traditional culture.

The same court culture that celebrated tradition and cultural continuity over innovation and invention actively worked to prevent the infiltration of new technologies from outside China, denying legitimacy to foreign technologies. Gifts from European governments intended to demonstrate technological superiority were sequestered in a royal museum located outside the capital city, where they were presented as oddities from beyond the edges of the civilization (Sahlins 1994). This practice denied the legitimacy of technologies and artifacts from outside China, emphasized the emperor's connection to Chinese culture and tradition, and enhanced the status of the Chinese Emperor - he became a patron of European noble clients vying for China's markets.

The legitimacy conferred on material culture by celebrated public consumption provides us with a means for understanding the processes of technological innovation in societies where no framework for scientific research exists and where social, economic, and historic factors conspired to make experimentation, invention, and innovation necessary elements of artistic production. The following chapter examines the outcome of patron-client relationships and court competitions as reflected in changing ceramic technology at Piedras Negras during the early sixth and seventh centuries A.D.. As described in previous chapters, this was a period of profound sociopolitical change in at Piedras Negras and across the Maya Lowlands. The changes occurring at the site during this time were played out in a variety of media, and were all intended, consciously or not, to stabilize political relationships and legitimate elite identities and status differences within the Piedras Negras polity.

Chapter 3

CERAMIC RESEARCH AT PIEDRAS NEGRAS, GUATEMALA, 1933-2003

This chapter is broken into three major sections. The first presents a description of the site and setting of Piedras Negras. The second presents an overview of the ceramic research at Piedras Negras prior to the initiation of the Piedras Negras Archaeological Project in 1997. This research, most of which was undertaken between 1934 and 1983, was based on a relatively small ceramic sample recovered by the University of Pennsylvania excavations at Piedras Negras in the 1930s. Though valuable, the sample used by these researchers was too small to provide a representative picture of the ceramics. The final section focuses on research since 1997, describing the ceramic sample recovered from Piedras Negras between 1997 and 2000, and the methods employed in establishing the current Piedras Negras ceramic typology and chronology.

The research presented in this dissertation and elsewhere (Muñoz 1999, 2001a, 2001b, 2003; Muñoz and Fitzsimmons 1998; Munõz and Golden 2002; Muñoz et al. 2006) is based on a sample much larger and better provenienced than the previous sample. As a result, it was a necessary part of the work presented here to improve upon, wherever possible, the efforts of previous researchers. In addition to establishing a new chronological and typological seriation for the Piedras Negras ceramics, this research dictated the strategies employed in the stylistic and instrumental neutron activation analyses (INAA) that are the focus of this dissertation.

PIEDRAS NEGRAS: THE SITE AND THE SETTING

The Classic Maya site of Piedras Negras, Guatemala is located in an area of dense tropical forest in the Sierra de Lacandon at the western edge of El Peten, Guatemala. The site sits on a terrace overlooking the Usumacinta River, which forms the border between Guatemala and the Mexican state of Chiapas (Figure 3.1). The site itself is oriented roughly north-south and is arranged along the edges of a narrow valley which bisects a series of hill ranges that run approximately parallel to the river. These ranges are the result of the folding and faulting of the limestone bedrock during the Cretaceous Period. This limestone is part of Chapayal Trough geologic formation, which together with the Yucatan Platform and the La Libertad Trough, forms the Yucatan Peninsula (Vinson 1962).

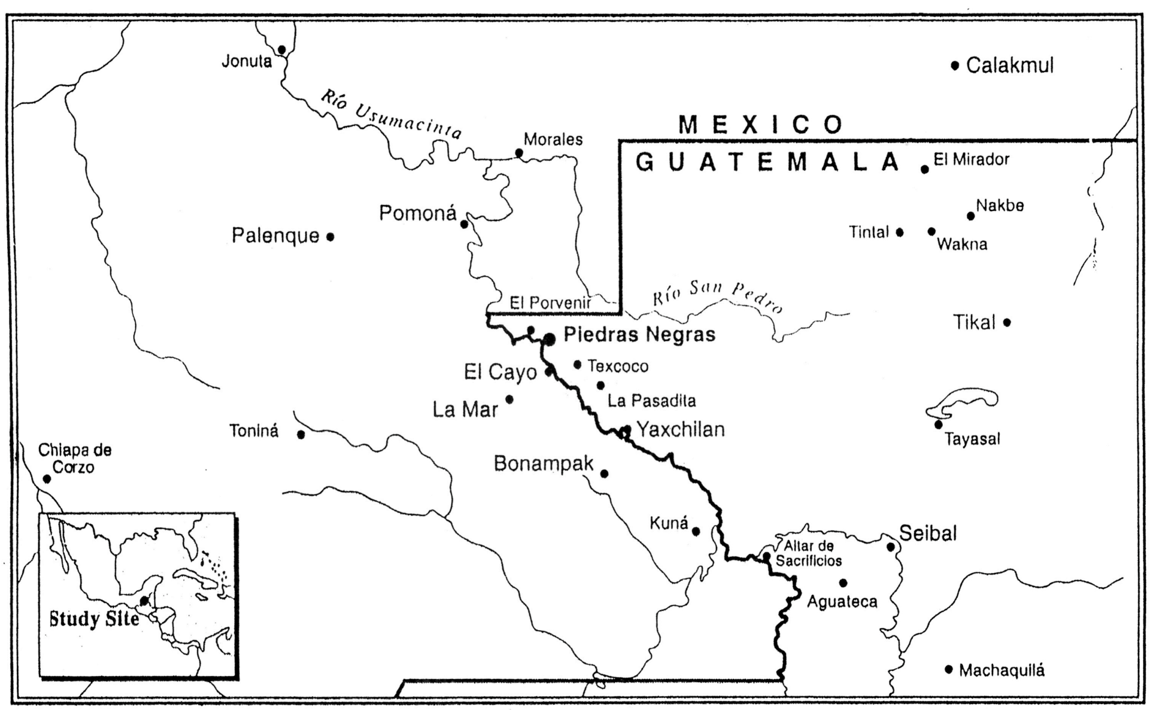

Figure 3.1 Piedras Negras Regional Map

The limestone surrounding Piedras Negras is exceptionally friable and has prevented the formation of deep caves. It has, however, resulted in the creation of numerous large sinkholes. One of these sinkholes, slightly more than half a kilometer from the site core, is over 100 m across and nearly 120 m deep (Houston et al. 1999). The ancient name for Piedras Negras, *Y'okib*, translates roughly as "large opening or entrance" and may have referred to this sinkhole (see also Zender [2002] and Stuart [2004]).[1] Sinkholes of similar magnitude, though more distant from Piedras Negras, are visible in aerial photographs and topographic maps.

From its confluence with Chixoy and Pasion rivers to the Boca del Cerro, the point at which it empties on the Tabasco plain, the Usumacinta River flows through a series of faults separating the Sierra de Lacandon from the adjacent Sierra de Coholita in Chiapas. Though large parts of this section of the river are navigable, rapids above and below Piedras Negras make modern river travel perilous, and would have created an obstacle for river-borne trade in the past. While the Usumacinta may have served as an artery for the downriver exchange of highland products, it is likely that traders journeying upriver would have used tributaries, like the Lacantun and Lacanja rivers, to bypass the rapids found on the Usumacinta.

Aliphat (1994) has observed that the valleys paralleling the river on the Guatemalan side of the Usumacinta would have made easy routes inland from the Tabasco Plain to the Peten. At their northwestern end, these valleys converge south of the town of Tenosique, while at their southern end, the valleys exit into the Peten near

[1] Both Zender (2002) and Stuart (2004) have suggested alternate toponyms of Piedras Negras.

Frontera Corozal. Noting the location of Piedras Negras, as well as other sites along the Usumacinta, Aliphat (1994:178-185) suggested that ease of ingress to inland portages may have been a factor conditioning past settlement.[2]

With the possible exception of Yaxchilán, Piedras Negras is the largest site in the upper Usumacinta drainage (Figure 3.2).[3] Piedras Negras is renowned for its architecture, art, and inscriptions. Piedras Negras has one of the most extensive epigraphic records of any Maya site, a fact contributing to Proskouriakoff's (1960) discovery of the historical content of Maya inscriptions. By studying the location and timing of specific hieroglyphs, Proskouriakoff determined that the stelae, rather than containing astronomical or calendrical data, described events in the lives of rulers. This discovery revolutionized Maya archaeology and made the modern study of the ancient Maya possible.

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[2] Historically these valleys have been used as overland routes between the Tabasco Plain and the Peten. In the 1920s loggers constructed a road through the more northern valley connecting Tenosique and Bethel. In the 1930s the University Museum Project constructed a road from Piedras Negras to Tenosique. Portions of this road were used by members of the BYU/Del Valle project traveling between the site and Corregidora Ortiz, Tabasco.

[3] Rands (1973) divided the Usumacinta river into three sections. The Upper Usumacinta is that section between the confluence of the Lacantun, Chixoy, and Usumacinta rivers and extending to the Boca del Cerro. The Middle Usumacinta flows between Boca del Cerro and Jonuta. The lower Usumacinta extends from the Jonuta until it reaches the Gulf of Mexico at the Laguna de Terminos. This division of the Usumacinta agrees well with the geology of the river as well as with the political position of Palenque. It does not, however, adequately reflect the political division of the Upper Usumacinta. The large sites of the Petexbatun region dominate the southernmost portion of the river. Piedras Negras and Yaxchilan, approximately 45 airline km downriver from the Petexbatun centers, were only minimally involved in the politics of areas farther upstream.

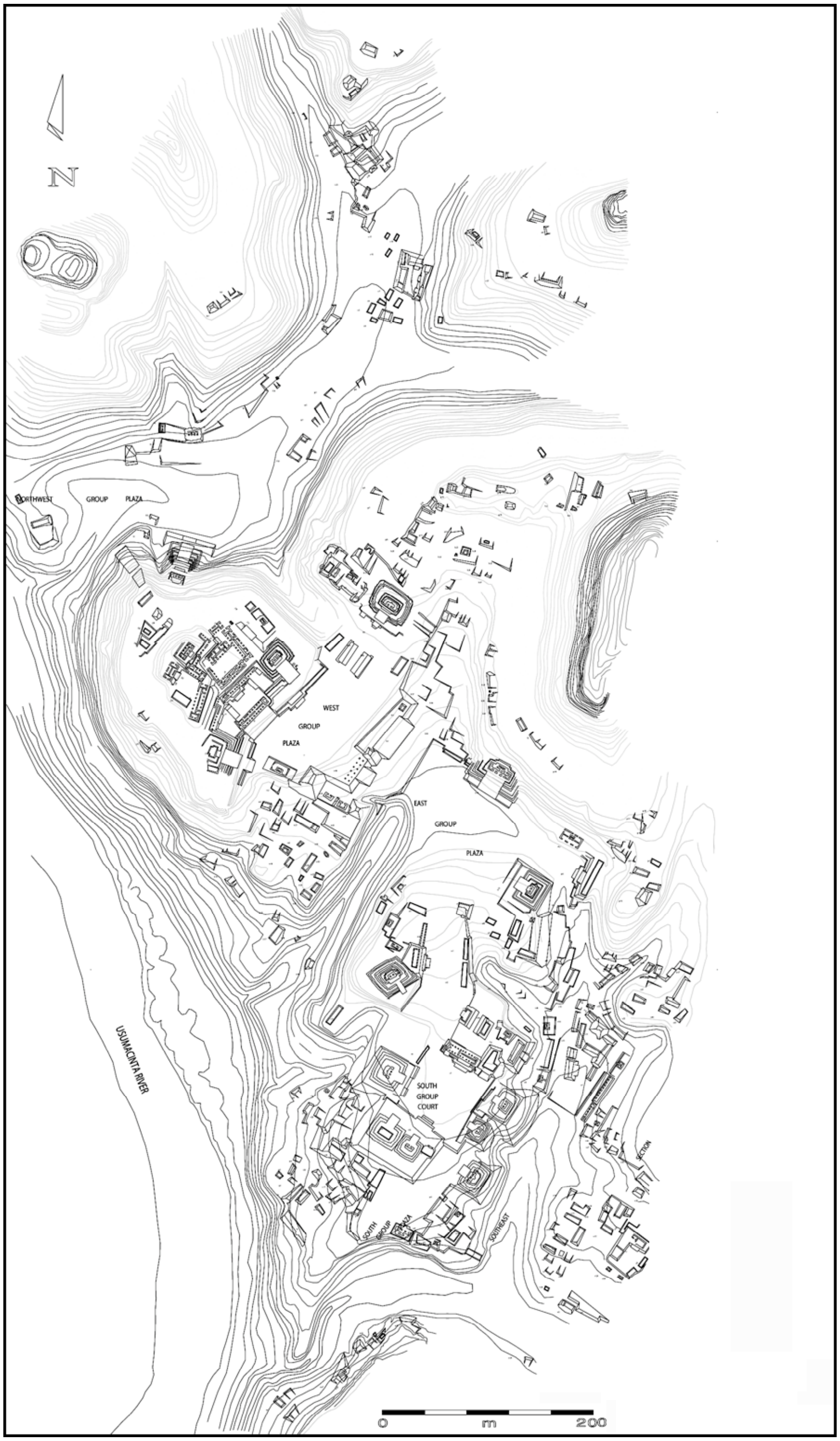

Figure 3.2 Piedras Negras, Guatemala

The southern portion of Piedras Negras consists of the South Group Court, South Group Plaza, and East Group Plaza. The Northern section consists of the Acropolis and the West and Northwest Group Plazas. The South Group Court and South Group Plaza overlook the river and are, for modern visitors, the principal ingress into the site. These plazas are bounded by a series of pyramids and sub-elite residential complexes. Excavations indicate that this area contains the earliest architecture at Piedras Negras. Both plazas appear to have been initially leveled during the Late Preclassic, though a Middle Preclassic residence may have been located here, probably beneath Strs. R-3 and R-4 (Escobedo and Zamorra 1999a, 2000a, 2000b; Muñoz and others 2001, Muñoz et al. 2006).

The central portion of the site consists of the East Group Plaza and the surrounding monumental structures including pyramidal Strs. O-12 and O-13 and monumental sweat bath Str. P-7. All of the visible architecture in this part of the site dates to the Late Classic. Naba and Balche phase ceramics have been recovered from fill within Str. O-13 and Str. P-7 indicating that construction began in this part of the site relatively early in the sites history. Unfortunately, excavations into these early deposits were limited, and it is impossible to determine the extent of early construction in this part of the site.

The northern section of the site is dominated by the Acropolis, a collection of royal residential and administrative structures built on a hill overlooking the West Group Court. The Court itself is built over the remains of a ruined Early Classic palace and was accessible from the East Group Plaza via a single large staircase (Str. F-2). During the Late Classic, the West Group Court may have served as a theater for ritual performances or processions. The Court is bordered at its northern end by pyramidal Str. K-5, and at its southern end by monumental sweat bath Str. N-1. Ball court Str. K-6 lies between the two structures on a line that would have brought participants directly past monumental staircase J-1, the principle access to the platform supporting pyramidal Str. J-4, and the staircase leading up to Str. J-2 and Court Two of the Acropolis. The Northwest Group Court lies north of the Acropolis and is an amorphous collection of pyramids and residential groups leading north from the site and occupying the edges of the narrow pass leading to an east-west oriented valley paralleling the river.

ARCHAEOLOGICAL RESEARCH AT PIEDRAS NEGRAS

Piedras Negras has been subject to two major archaeological expeditions. The first project, sponsored by the University Museum of the University of Pennsylvania, conducted eight seasons of excavations at Piedras Negras between 1931 and 1939. The University Museum excavations were first directed first by J. Alden Mason (1931-1932) and later by Linton Sattherwaite (1933-1939). Following a hiatus of nearly 60 years, during which logistical and political problems prevented work in this region of the Peten, a second project, the Proyecto Arqueológico Piedras Negras, was initiated by Stephen Houston of Brigham Young University (BYU) and Hector Escobedo of the Universidad del Valle (del Valle). The BYU/ del Valle project conducted four seasons of excavation at Piedras Negras between 1997 and 2000. The ceramics considered in this dissertation were drawn exclusively from this project.

The history of exploration and excavation of Piedras Negras is summarized elsewhere (Golden 2002:4-7; Houston et al. 1998, 1999, 2000; Maler 1901; Morley 1938;

1-303, see especially pp. 1-25; Sattherwaite 1933, 1935). This review focuses exclusively on previous ceramic research and is presented in two parts. The first is a description of ceramic sample deriving from the University Museum Project at Piedras Negras. The second is a description of the research based on that sample. The discussion of the Pennsylvania sample is necessary first to appreciate the difficulties encountered by previous researchers in working with this material and second to understand why the current sample is an appropriate one on which to build a revised ceramic chronology and typology and why it is appropriate for the research presented in this dissertation.

The Pennsylvania and BYU-Del Valle Ceramic Samples

The ceramic samples resulting from the two projects at Piedras Negras differ considerably in size, provenience, and the degree to which they can be taken as a representative of the ceramics of the site as a whole. The Pennsylvania excavations concentrated heavily on the monumental architecture at Piedras Negras, including pyramids, sweat baths, ball courts, and palaces, with relatively little attention paid to the smaller residential complexes scattered across the site or beyond the bounds of the site core (Appendix A). The objective of this research was to “attain a complete picture of the latest structures making up the main ceremonial groups” while, “peripheral ‘house mounds’ were neglected…in an effort to gain completeness in the main areas” (Sattherwaite 1943:7). Between 1931 and 1939, every major pyramid was excavated or trenched and the temples crowning each of these structures completely excavated (Holley 1983, Table 2; Sattherwaite 1936, 1943). In some cases, like that of Strs. O-13 and K-5, the amount of excavation was extreme - almost half of Str. K-5 was completely dismantled to reveal the underlying sequence of construction (Sattherwaite 1940a, 1940b), while in the case of Str. O-13, nearly the entire superstructure was demolished in an attempt to locate sculptures and caches.[4] Because the Pennsylvania excavations were focused on monumental architecture it does not seem likely that the ceramic sample recovered from these excavations is representative of the site-wide ceramic assemblage.[5] This problem is exacerbated when one considers the size of the sample available to previous researchers.

The Pennsylvania Ceramic Sample

Despite the great deal of work done at Piedras Negras by the University Museum Project during the 1930s, the sample from those excavations available is small, totaling no more than about 12,000 sherds (Holley 1986:49), split between the University Musuem in Philadelphia, and the Museo Nacional de Arqueología y Etnología (Museo Nacional) in Guatemala City.[6] Though by some standards this may seem a large sample, given the results of the BYU/del Valle excavations at Piedras Negras, this must represent only a fraction of the total material recovered. As an example of just how small a segment of the total recovered ceramic sample this must represent, during the 1998 season, the the BYU/del Valle project discarded, for logistical reasons, 1.7 tons of ceramics at the site as

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4 The excavations at O-13 were never fully published. The only available information on the work at this structure can be found in the photos and notes archived at the University Museum, and the exceedingly bare published descriptions by Mason, the principal excavator of O-13 (Mason 1933, 1934; see also Sattherwaite 1940; Coe 1959:79-89).

5 Some test-pitting was done, but the location of these test-pits was never adequately recorded.

6 Though no published description of the volume of material excavated by the University Museum Project exists, one needs only to examine the photographs of the excavations to appreciate how much material was recovered (Mason et al. 1934:31-32;Satterthwaite 1933, 1935,1936, 1940a, 1940b). These excavations were as intensive as any undertaken by the Proyecto Arqueológico Piedras Negras between 1997 and 2000.

non-diagnostic. That same season over 25,000 diagnostic sherds, with a total weight of over two tons, were shipped to the project's laboratory facility in Guatemala City. This is more than double the total retained by the University Museum Project, and was the result of only a single season of excavation by the BYU/del Valle project.

The uncertain division of materials between the Museo Nacional and the University Museum further compromised the quality of the sample available to previous researchers. Through an agreement with the Guatemalan government, half of all the excavated ceramics, including complete vessels, were to be sent to the University Museum with the other half remaining in Guatemala. Butler (1935:1) reports that this was the case with regard to the ceramics excavated during the 1931 and 1932 seasons, and data recorded on the sherds themselves indicate that ceramics from all eight seasons were sent to both the Museo Nacional and the University Museum. While there are10,000 sherds in the University Museum, however, there are only 1,390 sherds in the Museo Nacional in Guatemala City (Bachand 1997:13), suggesting that either a large portion of the sample was lost from the Museo or that the system for apportioning sherds between the museums was something other than reported.[7] Compounding this problem are the uncertain methods employed in selecting sherds for either the University Museum or Museo Nacional collections. Cresson (1941, in Bachand 1997:7) indicated that surface finish was the primary criterion, though the precise method by which ceramics were divided between the collections is unclear.

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[7] In addition to holding the largest part of the sherd collection, the University Museum holds almost all of the whole vessels recovered between 1931 and 1939 by the University Musuem Project.

Finally, the provenience of much of this material is difficult to reconstruct - the system used by the University Museum excavators is cumbersome, difficult to decipher (see Bachand 1997:6-8 and Holley 1983:5-6 for a description of the difficulties in establishing provenience for this material), and in some cases is non-existent. A fire in the Pennsylvania camp in 1932 destroyed half the camp and with it large amounts of material, including field notes, excavation records, photographs, and artifacts (Mason 1935a), and so for at least a portion of the available sample, no provenience data is available. That this fire occurred in 1932 is particularly unfortunate because this was the only season that Mary Butler participated in fieldwork (Sattherwaite 1943:5). Butler's research that year was focused on recovering ceramics from stratified deposits for use in her doctoral thesis, an analysis of the Piedras Negras pottery (Butler 1935).

Problems of sample size, representativeness, and the absence of clear provenience data or publications detailing the University Museum excavations of the 1930s made assembling even a rudimentary chronology and typology a difficult task. These problems have been compounded by the absence of comparative materials from elsewhere in this region - there have been no other major archaeological projects in this zone.[8] Elsewhere along the Usumacinta, work at Palenque (Rands 1966, 1968, 1973, 1974), Tonina (Bequelin and Baudez 1979) and Yaxchilán (Lopez-Varela 1988, 1992) has provided some bases for comparison. For most of the Classic Period, however, these centers maintained a ceramic identity separate from that of Piedras Negras.

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[8] Expeditions by the New Worlds Archaeological Foundation to El Cayo in 1964 and 1965 were highly preliminary (Lee and Hayden 1988). Peter Mathews conducted more extensive work at El Cayo in the 1990s, but this project was quickly terminated because of political problems in this region of Mexico. Extensive excavations conducted at Yaxchilan during the 1970's and 1980's have yet to be published.

The Current Ceramic Sample

In contrast to the ceramic sample available deriving from the University Museum Project, the ceramic sample recovered by the BYU/del Valle project is enormous, more representative of the site-wide assemblage than the University Museum sample, and very well provenienced. The current ceramic sample is comprised of over 100,000 sherds drawn from over 900 excavation units comprised of approximately 2,500 stratigraphic lots (see Appendix B). The excavations from which this sample was drawn were placed in every major architectural group at Piedras Negras and at every level of settlement, and included test-pitting, horizontal stripping, and tunneling operations. Stratigraphic control was maintained through the use of a standardized recording system - the "Altar" or "lot" system. This system is common to Maya archaeology and detailed descriptions can be found in Adams (1971:12) and Shook and Coe (1961).

Ceramic Research 1930-1997

Mary Butler (1935;see also Mason et al. 1934:35-36) and Frank Cresson (1937, 1941) attempted the first analyses of the Piedras Negras ceramics. Butler's work was primarily descriptive, though she did attempt to place the Piedras Negras ceramics in chronological order following variations in decorative technique and stratigraphic association (Butler 1935:1). Cresson's research focused on variation in foot forms and the implications of this seriation for the dating of Acropolis construction periods. Despite the fact that their analyses were performed before excavations were complete and before much comparative data was available, both of these researchers recognized the unique quality of the Piedras Negras pottery, describing it as a "distinct ceramic unit…marked by an extensive use, in polychrome ware, of negative painting" (Mason et al. 1934:35, see also Butler 1935:17).

World War II as well as a lack of funding prevented the complete analysis and publication of the Piedras Negras data. Throughout the 1940s and 1950s, however, Sattherwaite continued to examine the Piedras Negras material and encouraged other researchers to do so as well (e.g. Sattherwaite 1940a, 1940b, 1943, 1944a, 1944b, 1952, 1954; Coe 1959). In 1959, at the request of W. Coe, R. E. Smith attempted to align ceramic lots from Piedras Negras with materials from Uaxactun (Coe 1959:152-153, see also Smith 1955:Figure 85, a7-a10). This was the first attempt to place the ceramics of Piedras Negras in comparative perspective. Additionally, Smith also examined the ceramics held by the Museo Nacional.

Sattherwaite also submitted ceramics from Piedras Negras to Edward Sayre of Brookhaven National laboratory for one of the first applications of neutron activation analysis (Sabloff 1982; Sayre et al. 1958). Sattherwaite submitted sherds of the temperless fine orange ceramic characteristic of the Terminal Classic contexts at Piedras Negras (and also common at other Upper Usumacinta sites) as well as several sherds of Late Classic "Orange 2" (Butler 1935) cache bowls. Fine orange ceramics were presumably imports while the Orange 2 bowls were likely manufactured in or near Piedras Negras. These bowls were tested to establish a compositional base-line against which the fine paste materials could be compared (Sayre et al.1958:8-9). Neutron activation indicated that the Piedras Negras fine orange ceramics were compositionally more similar to fine orange pottery from the Maya site of Kixpek, Quiche, Guatemala, than to the locally made Orange 2 pottery. The success of this research in distinguishing between locally made and imported wares, as well as the ubiquity of fine orange pottery in Terminal Late Classic contexts elsewhere, led to the initiation of the Maya Fine Pastes project (Sabloff 1982:269).

Robert Rands derived the first ceramic sequence for Piedras Negras in 1960. This research, undertaken in a search for materials comparable to those of Palenque (Robert Rands, personal communication 2001) was reported briefly, in only a few publications (Rands 1967b, 1973), and with minimal description. In addition to these published papers, additional information on Rands' work with the Piedras Negras ceramics is recorded in a number of short, unpublished manuscripts on file with the University Museum, University of Pennsylvania (Rands 1960, 1961).

Rands left his position at the University of Mississippi to study the Piedras Negras ceramics. After spending several weeks in Philadelphia examining the Piedras Negras collection and assembling a preliminary chronology, he requested that the ceramics be sent to the McCafferty Laboratory at the University of Southern Illinois where he had taken a new post. Here George Holley, a student of Rands, refined the chronology, producing a seriation complete with type descriptions (Holley 1983, see also Holley 1986, 1987). As Holley (1983:15) notes, however, the erratic field collection procedures employed by the University Museum project resulted in a skewed ceramic sample significantly under-representing the variety and variability of the Piedras Negras ceramic sequence.

Bachand (1997) undertook a type-variety analysis of the Piedras Negras ceramics at the Museo Nacional, which were excavated in the 1930s by the University Museum project and left with the Instituto de Antropología e Historia as a type-collection. In his thesis, Bachand notes the difficulties involved in reconstructing the provenience for the ceramics.

Additionally, Bachand noted that Robert Sonin, a consultant to art collectors, examined the Piedras Negras ceramics in the 1960s (Bachand 1997:11).

Sonin, interested in the techniques by which the Maya achieved resist decoration,examined a large amount of pottery and experimented with various techniques with the intention of replicating ancient Maya resist. Unfortunately, this research was never published. Sonin did record, however, information regarding the resists decorated ceramics as notes left with sherds in the Altar de Sacrificios and Piedras Negras type collections housed in the Museo Nacional. Though the notes are not extensive, they indicate that the resist technique employed on the Piedras Negras and Altar ceramics was a multi-step process involving two or more applications of resisting material and slip, as well as possibly more than one firing (see Coggins 1975:46-47) (Figures 3.3 and 3.4).

Figure 3.3 A Sherd of Santa Rosa Polychrome excavated from Piedras Negras in the 1930s and studied by Robert Sonin. The note on the the sherd reads, “(W-5-9) Rare example of double resist w[ith] added postfire [black pigment] [illegible]. Also see St. Augustine Aguascatlan Bowl in Guat. Nac Museo - same technique. R. Sonin, June 1966”.

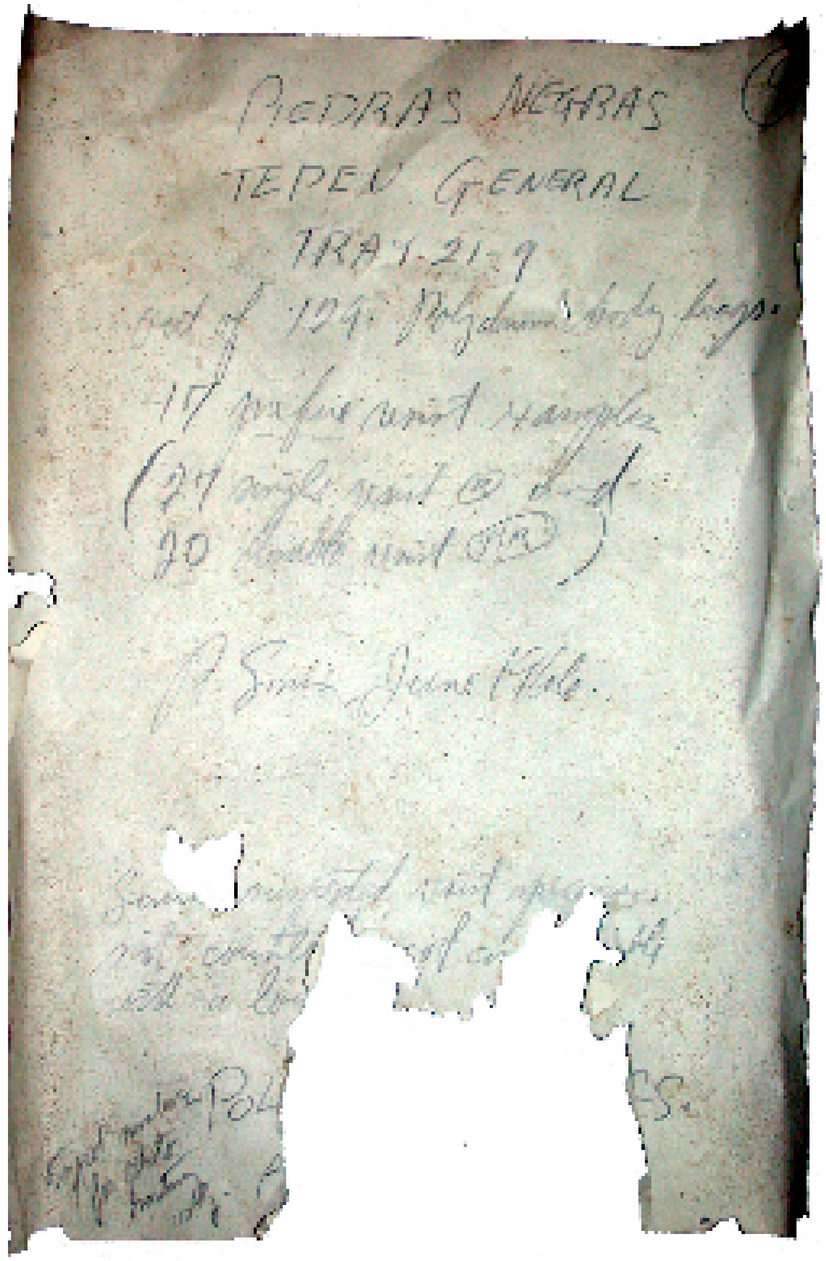

Figure 3.4 Notes left by Robert Sonin with the Piedras Negras type collection in the Museo Nacional. The note reads, “ Piedras Negras Tepeu General, Tray 21-9. Out of 129 body frags., 47 prefire resist examples (27 single resist and 20 double resist). R. Sonin June 1966. The lower section of text reads , “Seven [illegible] resist specimens not counted [illegible] of [illegible] with a [illegible].

CERAMIC RESEARCH 1998-2004

Between 1998 and 2003, the author of this dissertation spent a total of 35 months in Guatemala, both in the field and in the laboratory. The majority of this time (approximately 25 months) was spent in the project laboratory in Guatemala City, where he was aided in his analysis by Lica. Mary Jane Acuña and Griselda Perez-Robles, both of the Universidad de San Carlos.[9] Prior to the author's involvement with the current project, Forsyth and Hruby (1998) studied the ceramics excavated from Piedras Negras in 1997, noting previously unrecognized Middle and Late Preclassic complexes.[10]

The total quantity of ceramics recovered during the four years of excavation at Piedras Negras is staggering - over seven tons of ceramics were excavated from the site. The sheer quantity of ceramics found created an enormous logistical difficulty. Given the isolation of Piedras Negras, it was not possible nor desirable to remove all of these materials to the project laboratory in Guatemala City. Nearly 60 percent of the sample consisted of non-diagnostic unslipped and/or striated body sherds with little analytical utility. Transporting this material out of the field would have incurred vast expense, while warehousing this material at the project's laboratory facility would have occupied much-needed working space and created enormous problems when trying to store these

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[9] Throughout this chapter and the next, "we" refers to Muñoz, Acuña, and Perez. Far more than simply assisting in the analysis, Acuña and Perez were deeply involved in planning and executing all phases of the chronological and typological work. This research could not have been completed without their aid. Both Lic. Acuña and Lic. Perez completed theses on the ceramics of Piedras Negras. Acuña (Acuña 2004) wrote on the Early Classic ceramics of Piedras Negras, while Perez is writing on the Preclassic materials from Piedras Negras.

[10] Rands (unpublished notes, 1960) notes a "Chicanel" period on a brief description of the Piedras Negras ceramics archived at the University Museum. He states, however, that this material "was too rare for the recognition of pottery complexes" though he did recognize a few sherds of Sierra Red. Holley (1983:70-174) makes a similar statement.

materials in the national warehouse at the termination of the project.

The logistical and other difficulties necessitated the imposition of a sampling system to limit the amount of non-diagnostic ceramics sent to the project laboratory. The selected sample consisted of all diagnostic sherds, that is, all slipped, and/or decorated sherds and all slipped and unslipped rims and bases, as well as a 10 percent of those materials not typically considered diagnostic - unslipped, eroded, body sherds. This sampling strategy insured that all sherds of analytical utility were preserved for future analyses, while at the same time retaining a statistically representative sample of non-diagnostic materials for future analyses should that become possible and/or necessary.

The sample of non-diagnostic materials was selected by weight. While in the field, all of the ceramics from a single lot were weighed and the weight recorded. The ceramics were then sorted into diagnostic and non-diagnostic sherds. The non-diagnostic fraction was weighed, a 10 percent sample was selected randomly, and the remaining non-diagnostic sherds were disposed of in specially excavated pits near the field laboratory. This was repeated for every ceramic lot weighing more than .5 kg.

Once the ceramics were removed to the project laboratory in Guatemala City, every lot of excavated ceramics from Piedras Negras was systematically examined and either separated completely into its component ceramic groups or sampled for sherds to include in the type collection. By examining every lot, we insured that the type collection upon which the type descriptions and chronology for the site would be built was as representative of the site-wide assemblage as possible. This phase of the research involved the determination of chronology, the creation of provisional and, later, permanent ceramic groups, and finally the definition of types and varieties.

The laboratory work undertaken between 1998 and 2003 consisted of three major programs of research. The first was a lot-by-lot analysis of the ceramics for the purpose of establishing a site wide ceramic chronology and typology. The second program of research built on the chronological and typological work and consisted of collecting the data relevant to understanding the changes in the decorative programs of resist and resist-reserve ceramics through space and time. Differences in the variability of design elements and design organization may indicate differences in interaction and learning frameworks, production loci and, ultimately, production organization. This research relates directly to this dissertation and will be discussed in more detail in the following chapter. The instrumental neutron activation analysis (INAA) of resist/resist-reserve decorated and fine paste ceramics comprised the third and final program of research.

The INAA analysis, undertaken as part of the general ceramic research at Piedras Negras, consisted of two independent lines of investigation. The first involved the identification of variations in paste chemical composition among resist and resist-reserve decorated ceramics. Variations in paste chemical composition may be indicative of variations in paste recipe and, by extension, of differences in production loci and organization. The INAA analysis of the resist and resist-reserve decorated ceramics relates directly to the topic investigated in this dissertation and will be discussed further in a later chapter. The second program of INAA research consisted of testing the fine paste (Chablekal, Altar, and Tres Naciones group) ceramics from Piedras Negras for the purposes of establishing provenance and relationships to previously defined ceramic compositional groups. In many ways, this research is an extension of the fine paste research begun by Sayre and his colleagues in the late 1950s (Sayer et al. 1958) and continued to the present by Robert Rands, Ron Bishop and others (Bishop 2003; Bishop and Rands 1982; Rands 1974; Rands et al. 1982).

Laboratory Analysis 1998-2000

Because the chronological and typological research underlies all succeeding analyses, a detailed description of the methods and results of this work are necessary. This description begins with a discussion of the ceramic sample available for this research, including how material was selected in the field and in the laboratory for typological analysis. Following this is a description of the methods employed in separating and classifying the ceramics into increasingly fine typological units. These units formed the sampling universe from which material for the INAA and decorative design analyses was selected.

Type:variety-mode system is the standard classificatory system employed in the Maya area and was the method employed in this study. Alternative classificatory systems, such as those based on vessel form, function, or variations in paste color and/or texture, would have been inappropriate given the subject matter of this dissertation and, in any case, would not have been of sufficient resolution for the research presented here. In addition, the use of an alternate system of classification would have made comparisons with ceramic collections elsewhere difficult, and would have significantly impeded communication with other ceramicists working in the Maya area.

The Type:variety-mode system as employed in this analysis did not deviate substantially from the manner in which it has been employed elsewhere. It was, however, modified to address issues specific to Piedras Negras. These modifications are noted in the text and are, on the whole, minor. In applying the Type:variety-mode system to the Piedras Negras ceramics, we attempted to remain as consistent as possible with published descriptions of this system (Gifford 1960, 1961, 1963, 1976; Smith and Gifford 1965; Smith et al. 1960; Willey et. al 1967). This was done with the hope of providing as transparent a typology as possible - one that was logically coherent and easily interpretable by other ceramicists.

Before beginning the formal analysis of the Piedras Negras ceramics, it was decided that the best course of action would be to approach the work as if no previous research had been done with materials from the site. Given the sample available and the importance of the work in a regional context, we felt that it merited an analysis as complete and as independent analysis as possible – an analysis based on our familiarity with Piedras Negras and the excavations, and on our own observations regarding the course of ceramic change at the site. The advantage of this approach lay in the fact that it would simultaneously provide a check on the previous work by Holley, and at the same time prevent us from perpetuating any errors that may have existed in the original seriation.

Our work with the materials excavated from Piedras Negras indicated that while the original seriation may have seriously underestimated the variety and variability of the ceramics of Piedras Negras, the separation of the ceramics into their corresponding complexes and phases was fundamentally correct. Our work at the site and in the laboratory also indicated that the dates marking the beginning and ending of the ceramic phases were also essentially correct.[11] This fact, however, did not significantly alter our overall approach to the ceramics. Throughout the analysis we placed primary emphasis on our own observations, using Holley's work only as an occasional check. By doing this, we maintained a high level of comparability between the two bodies of work while at the same time ensuring that our analysis was as thorough as possible.

This program of research began by examining ceramics from lots that we were certain represented unmixed, single-phase deposits. These deposits included termination deposits found buried beneath later construction, as well as dense accumulations of ceramics deposited as trash within rooms. Examples include an Early Classic termination sealed below a floor and layer of burned clay on the steps leading up to Str. J-20 Sub. 1 (Golden 1998, 1999, 2002), an early (Tepeu 1) Late Classic termination in front of Str. F-6 Sub. 1 (Wells 1998), and dense ceramic deposits found inside the rooms of Str. J-17 (Child and Child 1999), and C-12 and C-11 (Jackson 2001). The context and content of these deposits indicate that they probably did not result from the reuse of materials for construction fill or other processes that would mix ceramics from disparate time periods. We were confident that these and similar deposits were the product of single, short-term activities containing ceramics manufactured and used at about the same time.

These deposits were sorted into provisional ceramic groups by time, surface finish, and decoration. While some of these materials corresponded to identified types, little effort was made at this stage of the research to maintain these types apart from the ceramic

[11] The authors worked with the Piedras Negras collection analyzed by Rands and Holley, and with the University Museum notes and provenience data. The preservation of most of the sample is poor, and the notes and provenience data are often difficult to interpret. Given this, the fact that the work of Robert Rands and George Holley is generally reliable is a testament to the skill of both of these ceramicists.

groups to which they belonged.[12] The goal of this stage of research was not to establish a typology based on the work of other researchers, but rather to establish a base-line series of ceramic groups useful for sorting and dating the ceramics recovered from other areas of the site. For that reason it was necessary to sort these groups as completely as possible, including in each ceramic group as much variety as possible.

Sorting these deposits completely was integral to the ceramic analysis but eliminated the possibility of ever examining them again as complete assemblages. For this reason, it was necessary to record all relevant assemblage data before these deposits were disassembled. To do this, we recorded information, by lot, on ceramic group, vessel form, vessel part, number of sherds and, finally, minimum number of vessels as determined from matches between pastes, form, and surface color/decoration.[13] These data were recorded on standardized data collection sheets using a series of numeric codes identifying specific attributes (Figure 3.5). This allowed us to quantify assemblage attributes by group, form or time period, and when coupled with digital photographs, created as accurate a record of these materials as was possible. Prior to placement with a ceramic group, sherds were marked with their archaeological provenience. This served as the key for locating the appropriate set of entries in the project ceramic spreadsheet.

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[12] In cases where a type seemed exceptionally well defined by Holley, either because of sample size or because of very clearly diagnostic decorative modes, we elected to "keep" this type, modifying the description, if necessary, as sample size increased.

[13] We realize that sherds from adjoining units may also have belonged to a single vessel and that this may go unrecorded on our data sheet and lead to an overestimate of the total number of vessels represented by Operation. We tried to limit this possibility whenever possible but catching every instance proved difficult and it is certain that many cases were missed.

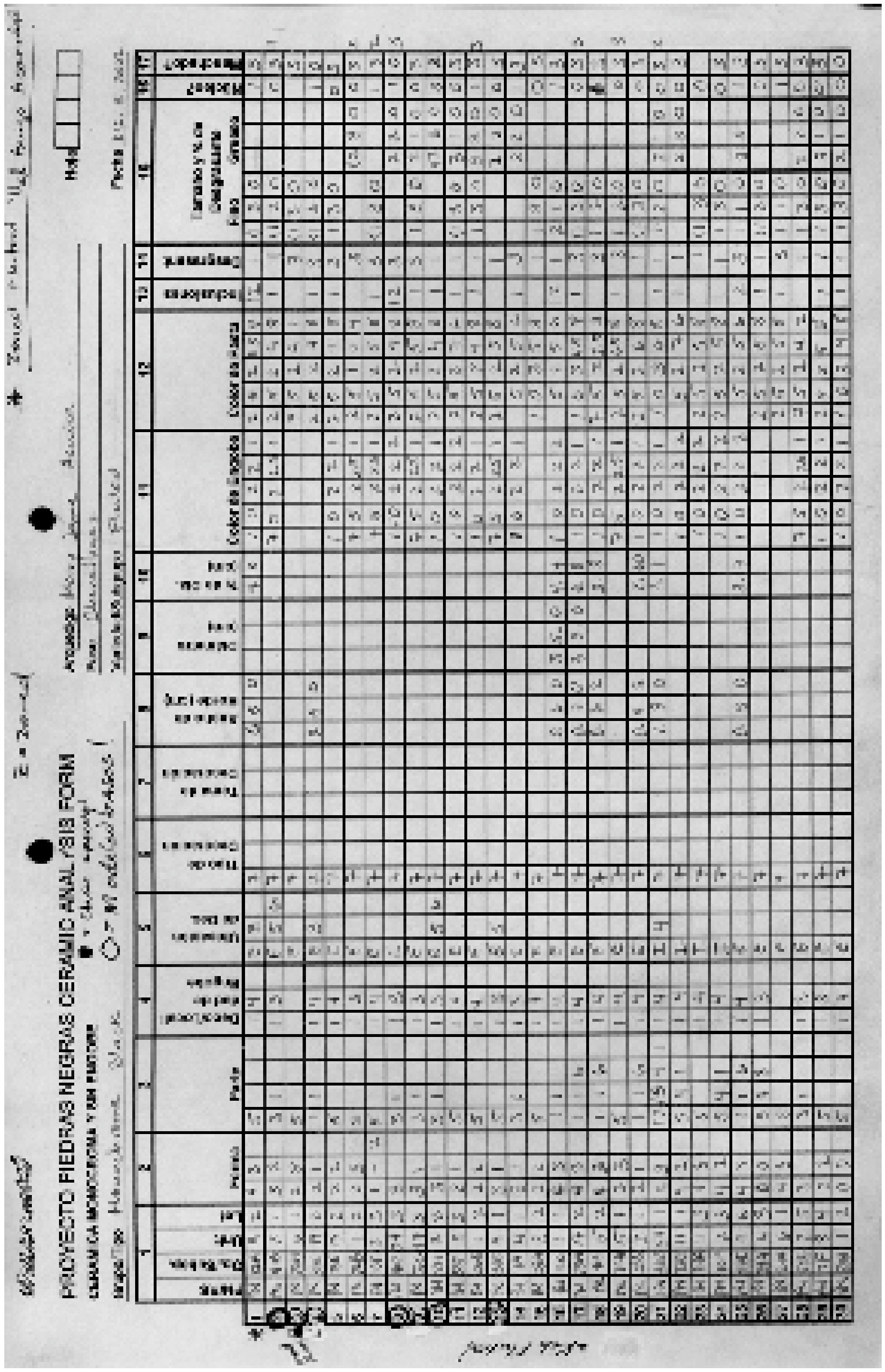

Figure 3.5 An example of a data collection sheet used in the initial stages of the Piedras Negras ceramics analysis.

Establishing and maintaining chronological control of the provisional ceramic groups was as important as establishing the groups. If we wished to sort materials from mixed contexts into appropriate groups, and if we wished to supply project members with dates for the excavated materials, then it was necessary that we establish, as quickly as possible, a chronology for the Piedras Negras ceramics.

The relative chronological position of the provisional ceramic groups was established primarily through:

1. The examination of stratigraphy (while in the field and in the lab
2. Examination of stratigraphically related ceramic lot
3. Comparisons with ceramics from other sites.
4. Collaboration with the excavator(s) of particular deposits.

The chronological position of the provisional ceramic groups was established by:

1. Examining the relationship between deposits and dated monuments.
2. Comparing the Piedras Negras ceramics to ceramics from other sites.
3. Examining sherds for hieroglyphic information to establish "no later than" dates for specific modes and/or types.
4. Utilizing absolute dating techniques, e.g. C-14 to date ceramic lots representing unmixed, single phase accumulations of material.

This exercise established a preliminary chronology for the provisional ceramic groups and for specific decorative and formal modes. The sum of this research was the creation of provisional ceramic complexes and phases and the preliminary definition of some ceramic types. Throughout the analysis, the ceramic chronology was frequently modified as our understanding of site stratigraphy, history, and ceramic change both within and without Piedras Negras grew more sophisticated. The large corpus of deciphered inscriptions detailing the history of this region (Anaya 2001; Martin and Grube 2000; Schele 1991), our work at the site, our direct interaction with the excavators, and our easy access to field notes insured that the assembled chronology reflected as accurately as possible the course ceramic change at Piedras Negras.

After sorting the ceramics from single-phase deposits, we began sorting ceramics from less secure contexts such as construction fill and shallow middens.[14] The ceramic lots selected for analysis at this stage of work were chosen on the basis of observations made while working at Piedras Negras, and experience working with the ceramics in the laboratory. The goal was to increase the size, variety and variability of the provisional ceramic groups. Because our intention was to create a typology based on as much of the Piedras Negras ceramic sample as possible, this step was necessary if we intended to sort and type all of the excavated ceramics.[15]

Once the ceramics from less secure deposits were sorted, and all relevant assemblage information recorded, we began sorting all remaining ceramic lots. This phase of the research began with the ceramics recovered during the 1997 and 1998 field seasons. These materials were sorted completely and divided between the appropriate

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[14] Only a few middens are known from Piedras Negras. These tend to be on bedrock and sealed by later construction. While they contain well-preserved pottery, they are neither as large nor as diverse as the deposits examined previously. Other contexts examined at this time included construction fill. Fill lots were chosen because they contained either exceptionally preserved pottery such as that recovered from Operations 32 and 34 or contained examples of exceptionally rare materials, e.g. the Middle and Late Preclassic ceramics recovered from platform R-2.

[15] Nearly 50 percent of the ceramic lots from Piedras Negras are mixed.. This mixing may result from the fact that the ceramics contained in these lots are somehow transitional in nature, i.e., they represent lots created at the time that modal frequencies were shifting from phase to phase. While this is possible, considering lots such as these transitional rather than as mixed is tantamount to creating new ceramic phases overlapping the bounds of the previously established phases.

ceramic complexes and groups.[16] Though extremely labor intensive, the same kind of assemblage data recorded for the special deposits were collected. This was done for the same reason presented above - once sorted, it would be impossible to ever examine these materials as an assemblage again.

After all of the ceramics recovered during the first two seasons of excavation were analyzed, we moved on to the second major phase of the research - the provisional groups were divided into sub-groups. The separation of groups into increasingly fine units was based primarily on similarities in form and decorative mode, though variations in surface and paste color were taken into account. At this stage of the analysis, for example, the Santa Rosa Ceramic Group, a resist and resist-reserve polychrome ceramic group, was separated into 17 sub-groups following variations in decoration, form, and chronology. These sub-groups approximated types, but were open to easy modification. The division of the provisional groups into sub-groups allowed us to systematically examine variations in form, decoration, and surface finish through time and space - the physical manifestations of our hypotheses regarding the course of ceramic change at Piedras Negras. As more data became available and as our familiarity with ceramics increased, sub-groups were modified, combined, or eliminated to best fit the evidence regarding the direction and timing of ceramic change.

The ceramics from the 1999 and 2000 field seasons were analyzed in the same manner as the materials from the 1997 and 1998 field seasons. By this point, however,

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[16] The ceramics from two large residential complexes (Operations 23 and 33) were not sorted completely. These ceramics represented very large domestic assemblages from sub-royal residences within the site core. Every lot was analyzed, but only a sample of material from these lots was selected for inclusion in the type collection.

some of the provisional ceramic groups had grown so large that it was no longer necessary to continue sorting every sherd from every lot. So, while continuing to record assemblage information, only the best-preserved and most diagnostic sherds were kept for further analysis. This was particularly true of the monochrome and unslipped sherds. All well-preserved polychromes, particularly the resist and resist-reserve decorated sherds, regardless of the size of the provisional group were kept. Throughout this phase of the research, we continued modifying and reordering the provisional ceramic groups and sub-groups as we gained a better appreciation of the variability present in the ceramics.

After all excavations were analyzed, we began combining the ceramic sub-groups for the purposes of establishing types. This was an iterative procedure and was carried out even as we began collecting the type-specific data. The collection of the type-specific data involved recording information on vessel finish, decoration, form, paste, and temper. To the degree possible, all of this information was recorded using standardized instruments. For example, all paste and slip colors were recorded using Munsell numbers, all data on temper size and density was measured using a grain size/density chart published in Orton (1993:230), and vessel and rim forms were keyed to illustrations based on idealized forms and examples drawn directly from the Piedras Negras collection. As each sherd was analyzed, it was marked with a code that served as a key to locating the specific page and line where the relevant data was located (Figure 3.6, Figure 3.7).

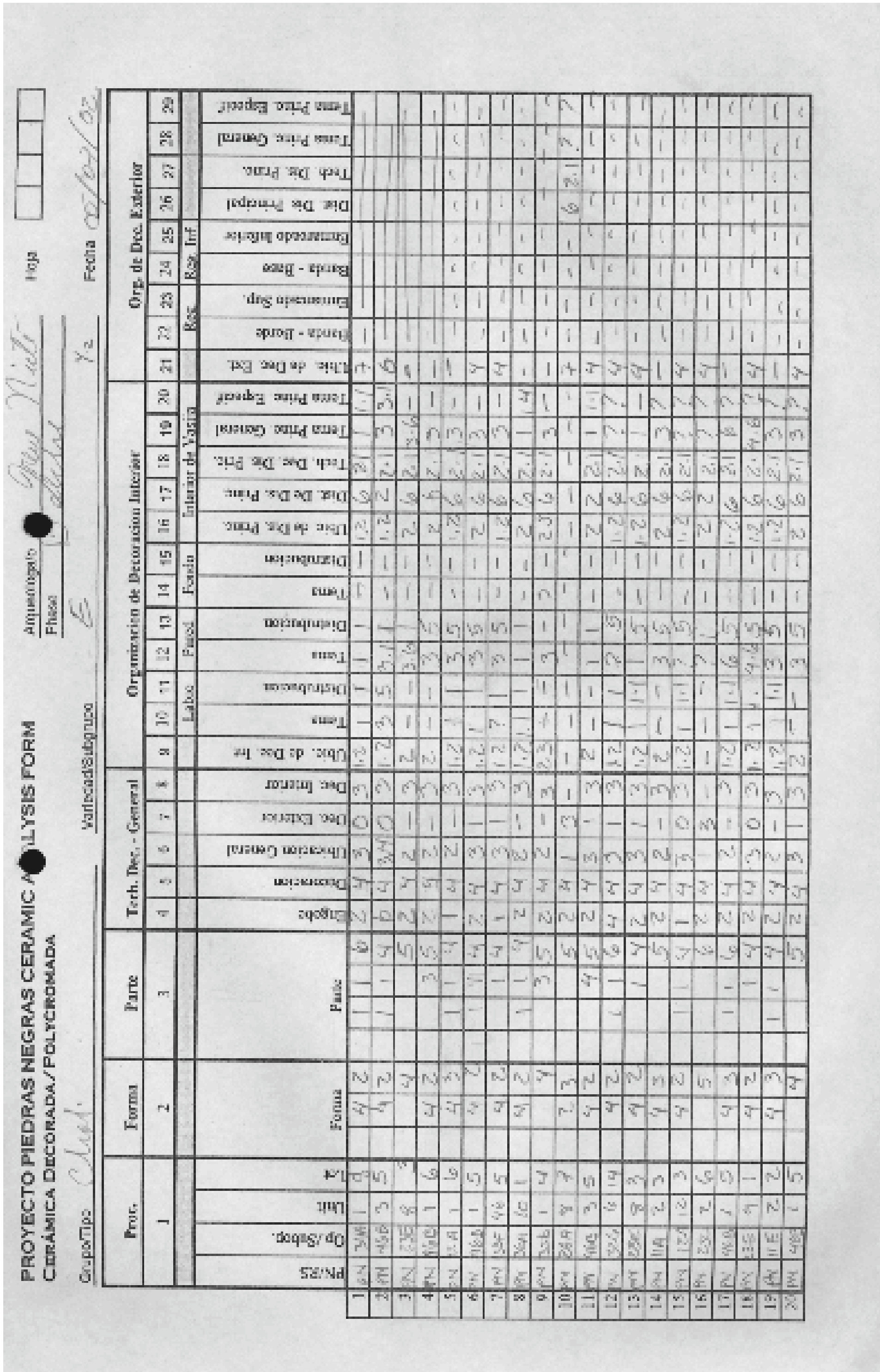

Figure 3.6 Type Data Collection Sheet, Front.

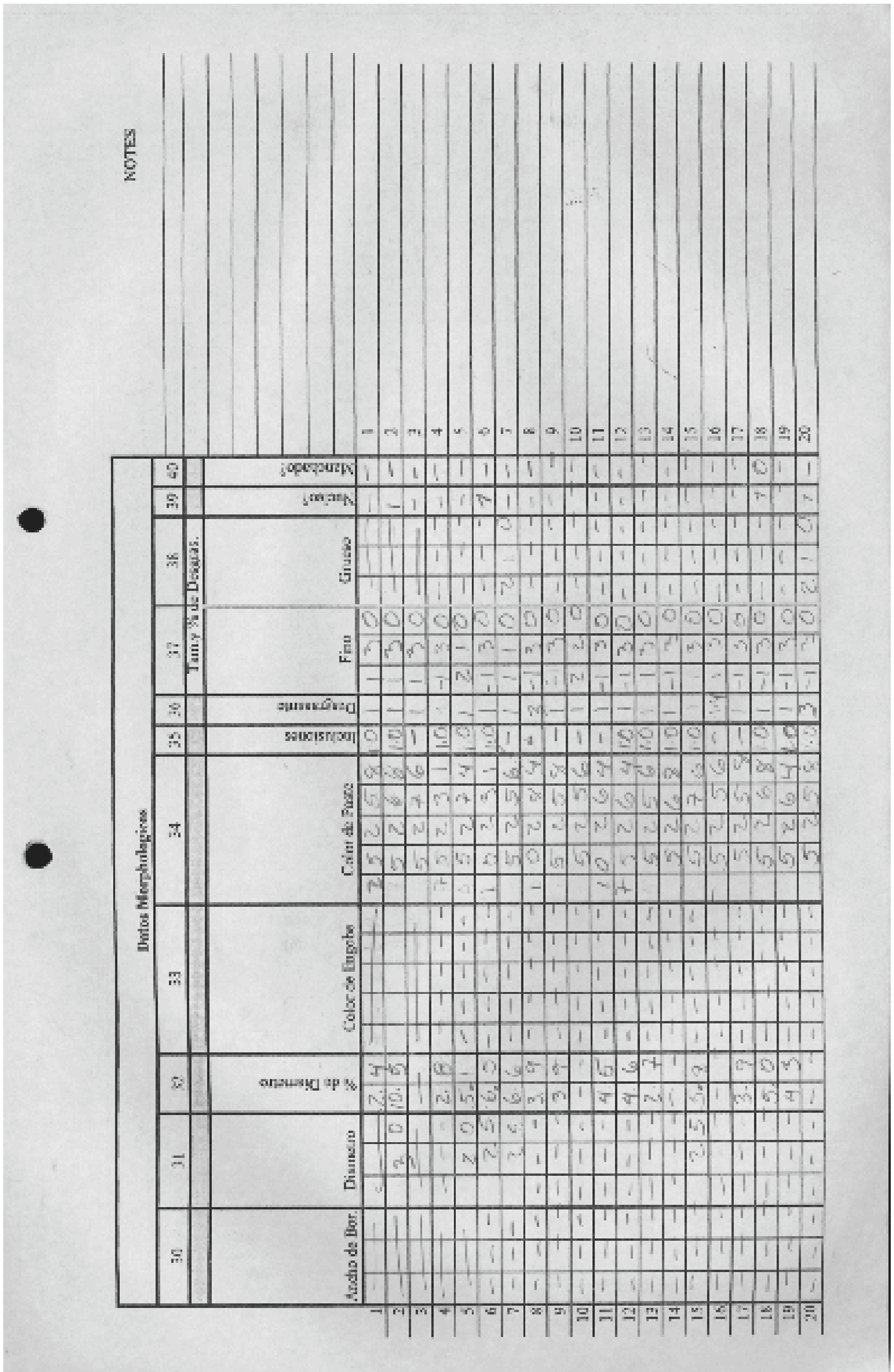

Figure 3.7 Type Data Collection Sheet, Back.

Ideally, this phase of the research would have commenced only after the ceramics had been sorted into types and varieties to the analyst's satisfaction. Unfortunately, time constraints prevented us from doing this. As a result, sherd type data were often recorded prior to placement within a type. When this happened, we simply made a note on the appropriate data sheet indicating the type to which that sherd belonged rather than re-record all of the relevant data. Once all of this information was entered into a database, we were able to combine all the sherds belonging to the same type and variety, even if they were originally analyzed separately (see Appendix D for a complete type list of the Piedras Negras ceramics).

Types were defined primarily on surface finish and decoration. However, we found that vessel form as well as paste color (see Holley 1983:218-219, and Bishop 1980 for discussions of changes in paste color at Piedras Negras) and compactness sometimes served, depending on the type, as reliable chronological markers. For this reason, these data were often incorporated into our definitions of specific varieties, though often they were alone not of sufficient magnitude to determine type or variety identity (see Gifford 1976:9-10). The decision to incorporate vessel form and paste data in variety definitions was based on thousands of repeated observations confirming the chronological importance of specific modes.

Conclusion

The method by which we approached the ceramic analysis insured that every lot of ceramics excavated from Piedras Negras between 1997 and 2000 was examined at least once while, large, single phase deposits such as the termination found in front Str. J-20 were subject to repeated examination both in the field and in the laboratory. The fact that the sample upon which this dissertation is based represents nearly 70 percent of all the diagnostic sherds excavated from Piedras Negras has several important implications.

First, the sample size and data collection strategy employed ensure that the chronology and typology presented in this dissertation is as representative of the site-wide assemblage as possible. This further implies that statements about the distribution of particular modes or types are based on knowledge of the entire sample, not just a limited subset. Thus, conclusions regarding the ubiquity or uniqueness of particular types can be taken as authoritative statements, rather than as unfounded assertions.

Second, the manner in which data was collected at all levels of analysis allows for the easy quantification of important variables such as vessel and rim form, vessel diameter, decorative motif, palette, and paste color and texture. Data on the frequency of specific attributes (e.g. vessel form, temper type, rim/lip morphology, decoration) can be quantified along typological and chronological axes such as type, variety, group, complex, or phase. The fact that these data are quantifiable will allow us to test the degree to which our observations regarding ceramic change at Piedras Negras is matched by actual differences in specific attributes. This ensures that the type descriptions resulting from this research will be as accurate a record of ceramic change at Piedras Negras as possible.

Finally, the manner in which the type-specific data was collected has important implications for the research presented here. Along with morphological data, type-specific data was collected on every polychrome sherd sufficiently preserved to observe and record palette, design organization, and decorative motif. As a result, it is possible to measure the co-variation of specific attributes within or between ceramic groups or types, or across proveniences and contexts. These measures take on added importance when combined with the results of the INAA analyses. By examining variations in paste composition with variations in design organization and execution, it may be possible to correlate changes in the distribution of resist decorated ceramics with changes in the production organization of those same types through time and space.

Chapter 4

THE CERAMIC SEQUENCE OF PIEDRAS NEGRAS, GUATEMALA

The recent excavations at Piedras Negras, the expanded knowledge of the epigraphic history of the Upper and Middle Usumacinta, and the vastly improved understanding of the rate, direction, and scale of the ceramic change at Piedras Negras have led to numerous revisions to the Piedras Negras ceramic chronology. This chapter presents the revised ceramic chronology for the site as well as a short history of settlement and occupation in this region of the Usumacinta. The goal of this chapter is to acquaint the reader with the ceramic sequence of the site and to provide some of the background necessary for understanding the ceramic changes discussed in succeeding chapters.

This chapter is broken into several sections. First, because the ceramic chronology presented in this chapter was built upon an extant chronology, a review of that work is a necessary precursor to a description of the more recent research. This is followed by a detailed discussion of the ceramic chronology. This section proceeds phase-by-phase through the ceramics of Piedras Negras, describing the most significant changes between phases as well as describing the contexts and dating of lots crucial to the ceramic chronology and typology. This chapter concludes with a review of the history of Piedras Negras from a ceramic perspective. This is a necessary introduction to the historical events affecting Piedras Negras between about A.D. 550 and A.D. 750, the time period during which most of the ceramic changes discussed in this dissertation occur.

PREVIOUS PIEDRAS NEGRAS CHRONOLOGIES

Robert Rands assembled the first chronological sequence for Piedras Negras in 1960 (1966, 1967, 1973). This sequence consisted of eight ceramic phases, including the now discarded Uitz and Tamay phases, as well as a nebulous “Post-Tamay” (Figure 4.1) period. Uitz, along with Naba, defined the Early Classic period at Piedras Negras. Naba was Rands’ suggested Tzakol 2 phase, while Uitz represented the Tzakol 3 period. The difference between the two phases was slight and based on perceived changes in the size and orientation of basal flanges and vessel walls of tripod plates, as well as on changes in the location and style of decoration on these vessels (Rands 1961).

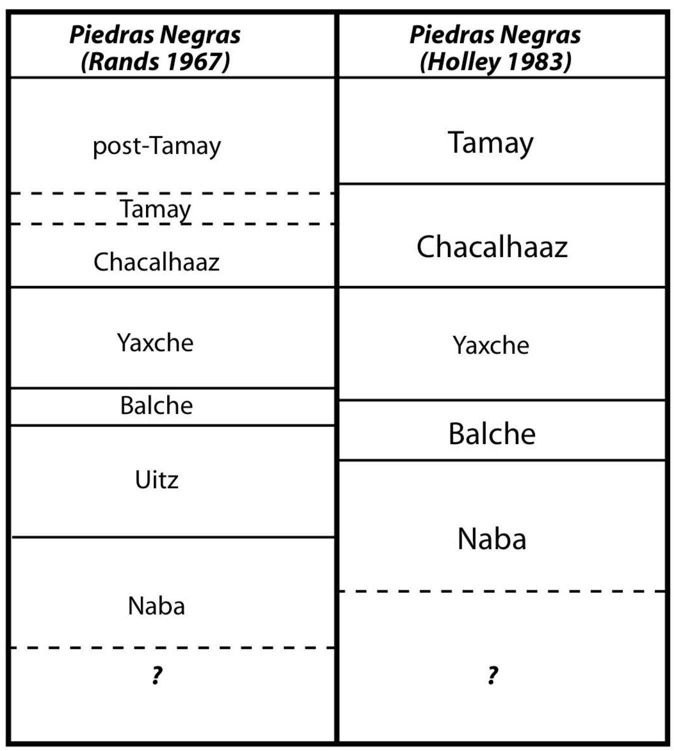

Figure 4.1 Initial iterations of the Piedras Negras ceramic chronology. Yaxche and Chacalhaaz are roughly equivalent to Tepeu 1 and Tepeu 2.

The Late Classic Balche, Yaxche, and Chacalhaaz phases were analogous to the Tepeu 1 and 2 periods. The chronological placement of these complexes was based primarily on the identification of shape modes held in common with the Peten as well as on the appearance of a few types with direct analogs elsewhere in the Peten, such as Saxche Orange Polychrome. The final ceramic phase defined by Rands, Tamay, corresponded to the Terminal Classic (Tepeu 3) abandonment of the site, and was defined by the presence of fine gray and fine orange pottery in surface contexts. The Post-Tamay period was identified primarily by Lacandon censers and other Post Classic ceramics found in situ on the floor of several structures (Figure 4.2 and 4.3).

Figure 4.2 Lacandon Censers *In Situ*, Piedras Negras 1934. (Photograph Courtesy of the University Museum, University of Pennsylvania)

Figure 4.3 Lacandon style censers from Piedras Negras (Photo by René Muñoz, Courtesy of the University Museum)

Holley's study of the Piedras Negras ceramics resulted in a significant reworking of Rands' chronology. Major changes included elimination of the Uitz phase, expansion of the Balche and Yaxche phases, and the creation of a Terminal Classic Kumche phase.Though Holley does not present his criteria for combining the Uitz and Naba phases, the likely reason was the lack of dramatic differences between Uitz and Naba assemblages, as well as the lack of deep Early Classic stratigraphy that would aid the identification of systematic differences between the two periods. Holley does suggest that there may be a pre-Naba complex identifiable by the occasional presence of basal flange, ring base bowls, a form absent in most Naba phase assemblages (Holley 1983:82).

The expansion of the Balche and Yaxche ceramic phases was done to accommodate the correlation of materials from both complexes with absolute dates derived from monuments found at Piedras Negras. Rands' dating of the ceramic phases was based entirely on comparisons with the Central Peten, while Holley was able to link episodes of construction and monument erection with specific ceramic lots. For example, Stelae 29 and 30, both found near Str. R-3 bear dates of A.D. 540 and A.D. 539. Both of these stelae are associated with Early Classic ceramics, indicating that these materials could be no later than the dates on those monuments. Excavations near Str. K-5 recovered a sample of Balche phase ceramics from beneath Stela 25. This stela bears a date of A.D. 608, indicating that the transition from Naba to Balche modes must have been complete sometime before A.D. 608 (Holley 1983:79-86). These correlations have been rechecked against the current ceramic sample and have, for the most part, been retained.

In addition, Holley redefined the Tamay phase, demoting it to a sub-complex of fine paste serving vessels marking the late facet of the Chacalhaaz ceramic phase. Like Rands, Holley associated this complex with the collapse of Piedras Negras, a suggestion derived from the recovery of 40 reconstructible or partially reconstructible fine paste vessels found on the floor of the putatively burned Str. J-12 (Holley 1983:157-159).[1] Holley is not explicit in his reasons for designating Tamay a sub-complex, though this may have been in part predicated on the belief that Tamay represented a variation of the larger Chablekal ceramic group unique to the southern portion of the Western Lowlands. This, however, is not sufficient reason alone to define a sub-complex.

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[1] There is debate as to whether this structure was burned or not. Of the three intact vessels found within this structure, only one showed evidence of burning and this may have been the result of a firing rather than exposure to a post-fire conflagration.

Given the definition of "sub-complex"[2], Holley's use of this term suggests that the typological differences between the Tamay and Chacalhaaz phases were insufficient to merit full phase designation. However, Holley states that "notable changes within the Chacalhaaz complex are coincident with this [Tamay] pottery" (Holley 1983:154), suggesting that the differences may have been quite significant. This ambiguity regarding the typological position of Tamay pottery was not due to any fault of Holley's; rather it was the result of a longstanding uncertainty regarding the timing, origin, and typological affiliation of the fine grey and other fine paste ceramics that became common in the Maya Lowlands after about A.D. 750.

Revisions to the Previous Ceramic Chronologies

While Holley's seriation of the Piedras Negras ceramics represented an improvement over previous work, issues of sample size resulted in a seriation that significantly underrepresented the time depth, variety, and variability of the Piedras Negras ceramics. The current ceramic sample is much larger, more systematically collected, and more representative than the sample available to Rands and Holley. As a result, we have made numerous changes to the chronology that reflect improvements in the sample, improvements in our understanding of the ceramics of other Western Lowlands sites, and a better grasp the region's epigraphic history.

Major revisions to the to the ceramic chronology include:

1. The recognition of Middle, Late and Terminal Preclassic ceramic phases.

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[2] A ceramic complex is the full pottery content of an archaeological unit. Sub-complexes are ceramic assemblages, "specially oriented towards religious ceremonial, or any other patterns within any given phase of culture". (Smith and Gifford 1965:502).

2. The faceting of the Early Classic Naba phase into Early and Late periods.
3. The elimination of the Tamay sub-complex and the proper recognition of the chronological and typological affiliation of the Piedras Negras fine paste pottery.

In addition to these changes, the typological content of the ceramic phases has been expanded and now better reflects the variety and variability of the Piedras Negras ceramic assemblage, and finer chronological control of the distribution of decorative modes and forms has been achieved. These modifications, in combination with the epigraphic data available for the region, have significantly improved our understanding of Piedras Negras' historical trajectory, particularly with regard to the collapse and abandonment of the site.

The Preclassic

Both Rands and Holley note the possible existence of a Chicanel or pre-Naba ceramic phase at Piedras Negras. However, Preclassic ceramics did not occur in sufficient quantity in the sample available to Rands and Holley to merit full phase or complex designation (Holley 1983:70-71). The reason for this lies in the fact that with few exceptions, almost all of the extensive excavations conducted by the University Museum Project were limited to the Acropolis or to the monumental structures in the central portion of the site (e.g. Strs. K-5, O-13, and P-7). In those cases where extensive excavations were carried out in the southern portion of the site. Preclassic ceramics were almost invariably found. However, the total quantity of ceramics found was never great and all were all recovered from mixed contexts.

Extensive excavations by the BYU/de Valle project (Arredondo 1999; Arredondo and Gillot 2000; Castellanos 1998a; Child and Child 2001b, 2001c; Escobedo and Zamorra 2000, 2001a, 2001b; Monterroso 1998a, 1998b; Urquizu 1998; Urquizu and Roman 1998) recovered substantial quantities of Middle, Late and Terminal Preclassic ceramics from the fill of the structures and platforms in the South Group Court and South Group Plaza. Preclassic ceramics were found in a minimum of 12 locations within these areas, with the single largest sample of ceramics coming from a deeply buried Middle Preclassic midden found beneath the platform supporting Str. R-5. On the basis of these excavations, we were able to successfully define three Preclassic ceramic complexes for Piedras Negras. Two of the complexes, Hol and Abal, correspond to the Middle and Late Preclassic periods, respectively, and fit well within the canons defining the Mamon and Chicanel ceramic spheres. The third Preclassic complex, Pom, is poorly defined, but most resembles Protoclassic assemblages found elsewhere.

The Early Classic

Rands' originally defined two Early Classic phases for Piedras Negras, Uitz and Naba. Holley later combined these into a single phase, Naba, equivalent to late Tzakol 2 and Tzakol 3. Recent work has, in essence, re-established Rands' Uitz division, but has incorporated it into a late facet of the Naba phase. This decision was based primarily on observed differences in Early Classic assemblages derived from beneath the floors of a series of structures buried beneath the West Group Plaza and Early Classic assemblages that stratigraphically must post-date these. These differences in timing were verified through absolute dates derived from monuments and radiocarbon and the correlation of archaeological evidence from Piedras Negras with historic events recorded at other sites.

The major differences between early and late facet Naba are, as Rands suggested, changes in the size and orientation of basal flanges and vessel walls of tripod plates, and changes in the location, style and organization of decoration on these vessels (Rands 1961). In addition to these differences, Late Naba assemblages may occasionally contain cream polychrome vessels decorated with specular hematite, or bichrome resists similar to examples from the Guatemalan highland (e.g. Woodbury and Trik 1954, Figure 267).

The Tamay Sub-complex and Western Lowland Fine Pastes

Aside from the recognition of three Preclassic complexes, perhaps the most important changes in the current chronology have been the elimination of the Tamay sub-complex, and the recognition of the correct chronological and typological organization of the Piedras Negras fine paste ceramics. Rands defined the Tamay phase primarily on the appearance of fine gray ceramics in Terminal Classic contexts, suggesting that these ceramics were related to the abandonment of the site. This placement resulted from:

1. Confusion regarding the chronological and compositional differences between Chablekal Fine Gray and Tres Naciones Fine Gray.
2. The frequent presence of Fine Gray and Fine Orange pottery in surface deposits.
3. The presence of Fine Orange pottery in Terminal Classic contexts elsewhere in the Maya Lowlands.

That this was the case is clear from Rands (1960) where fine gray is listed as a Tepeu 3 diagnostic along with “Y” group Fine Orange, the provisional name for what would come to be known as Altar Fine Orange. Nowhere in Rands’ notes is Chablekal listed. All fine grays are lumped into a single typological unit. Holley, taking advantage of data not previously available to Rands, separated Tres Naciones Fine Grays from Chablekal Fine Grays, and re-designated Tamay as a sub-complex defining late facet Chacalhaaz (A.D. 780 to A.D. 840) but confusion remained regarding the chronological placement of these materials.

Recent archaeological research has clarified the chronological placement of Chablekal Fine Gray and clarified the timing and cause leading to the destruction of Str. J-12 (Stuart 1998). Tres Naciones Fine Grays is compositionally similar to the Altar Fine Orange Group and compositionally distinct from those in the Chablekal Group - both Tres Naciones and Altar Fine Orange were manufactured in the Pasion/Chixoy Drainage, while the Chablekal Fine Grays are compositionally similar to fine pastes manufactured on the Tabasco Plain.

Archaeological evidence from the site of Altar de Sacrificios and Seibal, both in the Pasion/Chixoy drainage, indicates that Altar Group fine paste ceramics first appear in that area around A.D. 830, a date securely linking them with the Terminal Classic at those sites. Chablekal Fine Gray appears no earlier than A.D. 730 at sites on the Tabasco Plain, and is abundant at Palenque by about A.D. 760. This agrees well with recent observations regarding the distribution of Chablekal Fine Gray at Piedras Negras, where it appears in a few contexts that must date to the late Yaxche ceramic phase (A.D. 690 - A.D. 750). In short, the appearance of Chablekal Fine Gray pre-dates the appearance of Tres Naciones Fine Gray and Altar Fine Orange by about 100 years.

Given the uncertainty over the timing of Chablekal Fine Gray, Holley believed that the destruction of J-12 must have taken place sometime during the first half of the ninth century and used the appearance of “Tamay” pottery to mark late facet Chacalhaaz. However, if Str. J-12 was burned, this event probably took place in A.D. 808 when Piedras Negras was defeated by forces acting at the behest of the ruler of Yaxchilán (Stuart 1998). If J-12 was razed at this time, then the Chablekal Fine Gray and other fine paste vessels found on the floor of this structure (Cresson 1935; cited in Holley 1983:158) must date to before A.D. 808.[3] There are a number of contexts at Piedras Negras, both on the Acropolis and elsewhere, which must post-date the ostensible destruction of J-12 and contain no fine gray ceramics. This suggests that by approximately A.D. 810, fine gray pottery was no longer available to the residents of Piedras Negras. This date is in agreement with the timing of Chablekal fine grays at sites on the Tabasco Plain. Recent research in and around Palenque indicates that Chablekal fine gray was not produced after about A.D. 840 (Robert Rands, personal communication 2003).

Ron Bishop and Robert Rands have identified a variant of Chablekal Fine Gray they have named Fine Pale Orange. In terms of form and decoration, this ware is nearly identical to Chablekal. However, surface color and paste composition diverge dramatically from most Chablekal pottery. Rands (personal communication 2003) suspects a chronological difference between the two and that Fine Pale Orange may represent a late variant of Chablekal Fine Gray. The basis for this is the apparent frequency of Fine Pale Orange in the upper levels of the material filling structure J-12. However, given the poorly recorded excavations of this structure in the 1930s, this is a difficult proposition to verify. In any event, if this were the case, it would lend some credence to Holley's idea that the fine paste ceramics from Piedras Negras represented a regional variant of Chablekal. Unfortunately, only two sherds of Fine Pale Orange were found by theBYU/del Valle. Without additional data, it is impossible to evaluate Holley's hypothesis. Instead, the lead of Robert Rands has been followed in establishing the typology of the Chablekal materials from Piedras Negras.

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[3] This unpublished manuscript is apparently lost. Searches at the University Museum archives have failed to produce a copy. In addition, it is not clear that the materials analyzed by Holley do, in fact, represent complete vessels - many of the semi-complete or complete vessels from J-12 are, in reality, only collections of sherds, many of which when reassembled represent less than half of a vessel.

Rands has proposed a modification to the Type:variety system that would address the range of variation evident in Chablekal paste color and provide a solution to the problem posed by the appearance of Fine Pale Orange at Piedras Negras and at other sites. Rands suggests that the Chablekal Ceramic Group be divided into three paste classes, with each paste class sharing the same set of type and variety names. This would account for the range of variation in paste color, preserve the typological affiliation of these materials, and provide future specialists with standardized vocabulary useful for describing and studying these materials. In accordance with Rands' suggestion, the fine pale orange ceramics of Piedras Negras form a single paste class, Fine Pale Orange, within the Chablekal ceramic group.[4] The types within this group and paste class are identical to the type and varieties proposed by Berlin (1956), Smith (1971), and Rands (2003).

In summary, recent research indicates that Chablekal Fine Gray, the major constituent of the previously identified "Tamay sub-complex" is an early facet Chacalhaaz diagnostic and is associated with the period of peak population at Piedras Negras rather than with its abandonment. Accordingly, the term "Tamay" has been abandoned. Furthermore, it is clear that while some of the surface color variation in the Chablekal from Piedras Negras may represent a unique regional iteration, this division lacks analytical utility. Finally, following the lead of Robert Rands, all of the non-fine gray Chablekal materials from Piedras Negras

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[4] Fine Pale Orange is compositionally similar to Chablekal Fine Gray, but is separable on the basis of elevated titanium concentrations, suggesting a different production loci from the other fine paste ceramics. The compositional profile of this material, however, fits within the general Usumacinta resource zone. The distinctive color of thin pale orange ceramics results from the oxidization of chromium during firing. The color is an intentional result and is another indicator that the production loci for this material is different from the loci where Chablekals were manufactured. Bishop (personal communication 2005) suspects that potters at Piedras Negras may have been trying to create their own version of Chablekal fine gray, but it is unlikely that fine pale orange represents those efforts.

have been placed into his proposed Fine Pale Orange paste class and all of the previously employed type names have been retained.

THE CERAMIC SEQUENCE OF PIEDRAS NEGRAS

The current ceramic chronology of Piedras Negras extends from approximately 650 B.C to A.D. 850 and is divided into eight phases (Figure 4.4). The Piedras Negras ceramics from the Middle Preclassic until approximately A.D. 550 are similar to contemporaneous ceramics manufactured elsewhere in the Maya area. Beginning at after A.D. 550, however, the ceramics enter into a period of sustained and gradually accelerating change lasting until about A.D. 675. This period encompasses the latter half of the Naba phase, all of the Balche phase, and the majority of the Yaxche phase. During this period the ceramics of Piedras Negras undergo their most profound changes and take on their distinctly regional character. As noted elsewhere in this dissertation (see also Muñoz and Golden 2002, 2004) these changes occur concomitantly with larger sociopolitical changes taking place specifically in the Usumacinta Basin, and more generally across the Maya Lowlands.

After approximately A.D. 675, and until the abandonment of Piedras Negras at about A.D. 900, the ceramics of Piedras Negras maintain their independent character, though throughout this time there are increasing similarities between Piedras Negras and other Maya sites, particularly those on the Tabasco Plain such as Palenque and Tonina. This increase in similarity is due, no doubt, to the heightened political interaction between these areas at this time (Anaya 2001; Martin and Grube 2000).

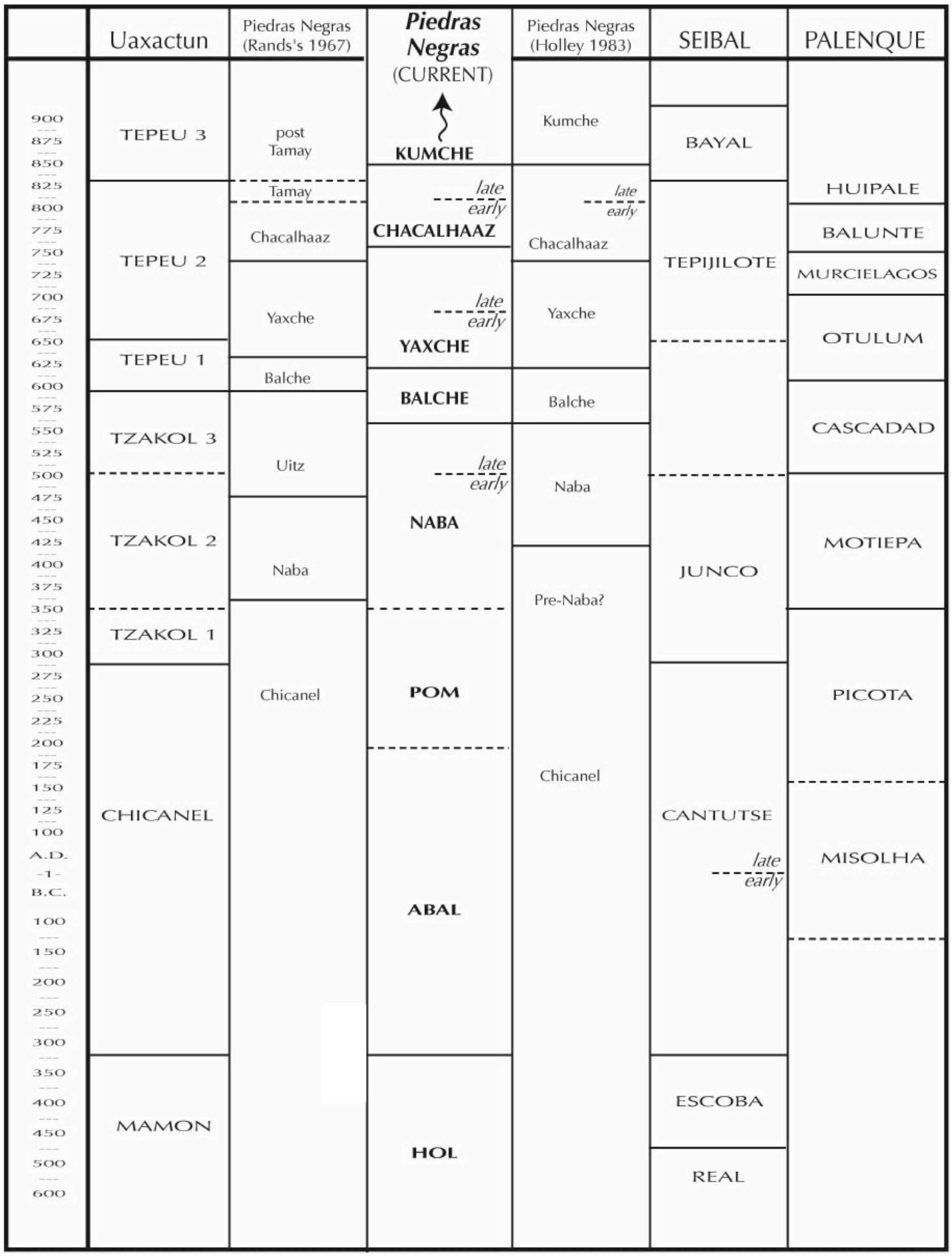


Figure 4.4 Comparative chronology of the Piedras Negras ceramic sequence.

Following a defeat by Yaxchilán in A.D. 808 (Stuart 1998), Piedras Negras went into a steep decline. Though some of the larger structures at Piedras Negras continue to be used and maintained after A.D. 808, it is clear that many other buildings within the site were abandoned or were being used as dumps for domestic trash. Like most other Maya sites, the stratigraphic and epigraphic data necessary to place an absolute date on the final abandonment of Piedras Negras is lacking. However, the absence of substantial amounts of Postclassic pottery suggests that the site was essentially empty by A.D. 900.

The Preclassic

The earliest definable ceramic complexes at Piedras Negras, Hol and Abal, are typologically equivalent to late Middle Preclassic and Late Preclassic assemblages recovered from other Maya sites. On comparative grounds, the end of the Middle Preclassic Hol phase is placed at about 300 B.C., and the end of the Late Preclassic Abal phase at approximately A.D. 200. A few sherds bearing some typological similarity to Xe phase ceramics from Altar de Sacrificios (Adams 1971) have been found at Piedras Negras, suggesting a greater time depth for settlement along this part of the Usumacinta than indicated by the Hol complex assemblage. Unfortunately, these materials are too rare to allow the definition of a ceramic complex for this period. Following these Preclassic phases is a poorly defined period, designated Pom. This complex corresponds to the Protoclassic complexes identified elsewhere (Brady 1998) and is recognized by the occasional appearance of mammiform supports, Usulutan style decoration and monochrome orange slips. This phase is tentatively dated to A.D. 175 to A.D. 350.

Preclassic Dates

Preclassic dates were established through comparisons with other Lowlands sites and through the use of absolute dating techniques. Absolute dates derived from carbon samples taken from a midden found in front of Str. R-5 were determined to be Middle Preclassic by ceramics alone. These analyses (AZ 1366, 1367, 1368, 1369 Table 1) returned dates which fit well with the dates established for Middle Preclassic sequences elsewhere, thereby indicating that the ceramics identified as Middle Preclassic at Piedras Negras on form and finish alone were a chronological fit with Middle Preclassic ceramics identified elsewhere.

Table 4.1 Uncalibrated Radiocarbon Dates for Preclassic Contexts from Piedras Negras

Sample ID	Material	Age B.P.
AA1366	Bone	2,412±37
AA1367	Carbon	2,378±47
AA1368	Carbon	2,439±43
AA1369	Carbon	1,503±52

The lack of deep Preclassic stratigraphy at Piedras Negras prevented us from defining the beginning and ending of the Middle and Late Preclassic phases exclusive of the appearance of these materials at other sites. Because of the necessity of establishing a definite chronological range for these materials, it was best to define these in terms of Middle and Late Preclassic phases identified at those sites nearest Piedras Negras for which good chronological and stratigraphic data were available. For that reason, added weight has been given to the Preclassic division suggested by Adams (1971) and Sabloff (1975) for Altar de Sacrificios and Seibal, respectively. This decision was made because of the high typological similarity between the Preclassic ceramics of these two sites and those of Piedras Negras, as well as the proximity of those sites to Piedras Negras.

Preclassic Contexts

Almost all Middle and Late Preclassic ceramics from Piedras Negras were recovered from the South Group Court, South Group Plaza, and associated structures (Figure 4.4). Most Preclassic materials were found in construction fill, much of it related to the initial construction of the platforms supporting the monumental Early Classic structures dominating this sector of the site. In most cases, these platforms were built immediately above bedrock, and were not subject to extensive later remodeling. The fill of these structures tends to be near the surface, shallow and subject to intensive bioturbation - almost every lot of Preclassic ceramics found in these locations is mixed and eroded. As a result, the useful sample of Preclassic materials is quite small compared to the overall quantities of material excavated.

Fortunately, test pitting of the basal platform supporting Str. R-5 revealed a stratified accumulation of cultural debris almost three meters deep. The deepest excavations recovered 700+ sherds of Middle Preclassic and Late Preclassic ceramics, over 200 fragments of animal bone, numerous chert and obsidian flakes, as well as several fragments of carbon (Escobedo and Zamora 2000, 2001b). The matrix encountered in these lots was dense and sticky, with a clay-like consistency probably due to a high organic content. Taken together, these data suggest that this was most likely a midden created during the Middle Preclassic. Outside of the southern sector of the site, Preclassic ceramics are exceptionally rare. Though a few sherds of Late Preclassic ceramic have been found in deep excavations on the Acropolis, the loosely consolidated fill, as well as the great depth at which these materials were found, make it nearly impossible to determine the nature of the associated architecture. Golden (2002) notes that some of the Preclassic materials found on the Acropolis, particularly a large fragment of a Sierra Red bowl, may have been intentionally cached on the Acropolis to prior to construction.

Despite extensive test pitting and excavation, no Preclassic ceramics were found in any the peripheral residential groups (Amy Kovak, personal communication 2003). Preclassic ceramics have been recovered, however, from a number of secondary sites near Piedras Negras including El Cayo and El Porvenir (Lee and Hayden 1988; Webster and Kirker 1998). These data, in combination with the Piedras Negras data suggest Preclassic occupation in the area was light and restricted to areas adjacent to the river.

The Middle Preclassic - The Hol Ceramic Phase

The Hol ceramic complex represents the first major occupation of Piedras Negras. On the basis of comparisons with other sites, we estimate this phase to last from about 500 B.C. to approximately 300 B.C.. Hol ceramics were found in 10 locations, all in the southern sector of the site (Figure 4.5). Almost all Hol ceramics have been found in construction fill mixed with later Abal phase materials. The exception to this pattern was the discovery of the Middle Preclassic midden in front of Str. R-5. The lowest level of this deposit consisted exclusively of Middle Preclassic ceramics.

Figure 4.5 Map of Piedras Negras showing the areas where Middle Preclassic ceramics were recovered.

The sample of diagnostic Hol ceramic material is small and fragmented. The seven locations in which Hol material was found yielded only about 350 diagnostic sherds. For this reason it is difficult to describe with great confidence the complete range of forms represented in this collection. The most common forms appear to be thick walled bowls or plates with divergent to out-curving walls, slipped jars with short, nearly vertical necks, and dishes with thickened direct or thickened everted rims.

Slips are thick and waxy, with fire-clouding and crazing common. Red monochromes dominate the assemblage with both cream and black making up a smaller percentage of the assemblage. In general, surface penetration decoration such as incising, fluting, and gadrooning are the most common decorative modes. Resist decoration also occurs but is infrequent. The most common decorative motif appears to be parallel rows of incised lines on the interior surface of plate rims. This is followed by the use of gadrooning or fluting on the exteriors of bowls. Most vessels decorated in these ways belong to the Joventud group. Cream and black monochrome vessels are rarely decorated.

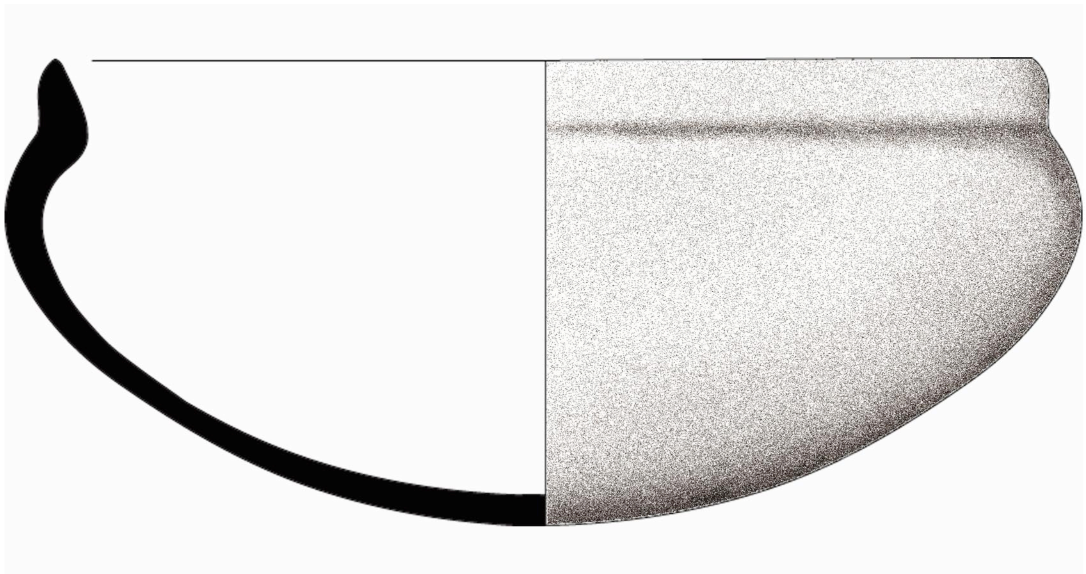
In most respects, Middle Preclassic ceramics of Piedras Negras resemble contemporary materials from elsewhere in the Peten. Donald Forsythe (personal communication 1999) has noted the Piedras Negras Middle Preclassic ceramics seem to be thicker and more heavily constructed than contemporary ceramics from other Lowland sites. If any major differences exist between the Middle Preclassic assemblage of Piedras Negras and those of other sites, it may be the lack variety in vessel forms, though this may be related to sample size.

The Late Preclassic - The Abal Ceramic Phase

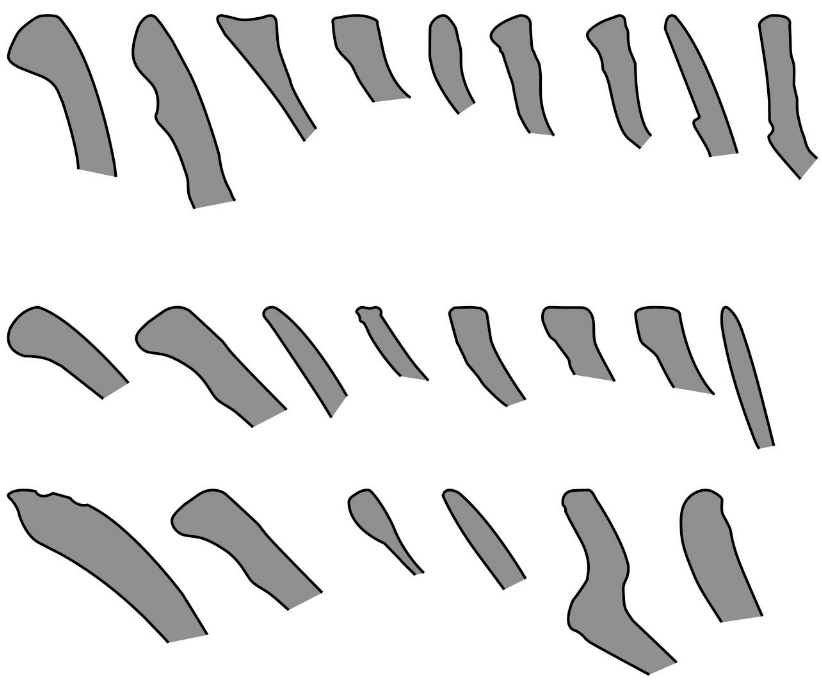
The Abal ceramic complex is similar to Late Preclassic assemblages known from elsewhere. On comparative bases, we estimate that this phase begins at approximately 300 B.C.. The date chosen for the termination of this phase, A.D. 175, is best described as a compromise accommodating the appearance of terminal Preclassic modes at different Maya sites and the perceived timing of their appearance at Piedras Negras.

Late Preclassic ceramics have the same distribution as Middle Preclassic ceramics. In almost all cases, Late Preclassic materials were found mixed with earlier, Hol phase ceramics in fill across the southern portion of the site. Additionally, large deposits of unmixed Late Preclassic ceramics were found stratified above Middle Preclassic ceramics in front of Str. R-5. Finally, a small amount of Late Preclassic ceramic were found in the C-Group located at the far north end of the site. Excavations here were limited, and the presence of Late Preclassic ceramics suggests that Late Preclassic settlement may have been more extensive than current evidence indicates.

At Piedras Negras, the Abal complex is dominated by monochrome reds, blacks, and creams. Slips are thick, waxy, and frequently crazed. Common forms include dishes with thickened and slightly everted or bolstered direct rims and jars with short, out-curving necks (Figure 4.6). Surface penetration decoration is common and is nearly identical to late Preclassic examples from elsewhere in the Peten. Common types include Altamira Fluted, Lechugal Incised, and Laguna Verde Incised.



Flor Cream
1:2



1:2

Figure 4.6 Late Preclassic forms. (Illustrations by René Muñoz)

In most respects, the Late Preclassic assemblage from Piedras Negras is nearly indistinguishable from contemporary materials found elsewhere in the Peten. Resemblances are particularly strong with the Cantutse phase materials from Seibal (Sabloff 1975) and, to a lesser degree, the Plancha phase ceramics from Altar (Adams 1971). It is important to note, however, that several important Preclassic modes, including medial or labial flanges and z-angle profiles typical of the Late Preclassic elsewhere, occur in far-below-expected frequency at Piedras Negras.[5]

The absence of this mode at Piedras Negras is curious and may be due to a "founder effect" whereby the original settlers of the region brought with them the knowledge of only a subset of the Lowland ceramic assemblage in use at the time. It is also possible that the absence of these modes may be related to Piedras Negras' peripheral location - it was simply not a full participant in the Chicanel ceramic sphere. That is suggested by the relatively low frequency of the clear Lowland modes in the Preclassic ceramics of Palenque and other western sites (Rands 2002). However, samples from these sites are small and may not be representative of site-wide assemblages.

The majority of all Abal complex ceramics from Piedras Negras are tempered with non-crystalline carbonate. There is a significant portion of the material, however, that is not tempered with carbonate and has instead a high concentration of mica. It is not clear whether this results from the addition of temper or from manufacture utilizing a non-local or local, geographically restricted clay. To differentiate these materials from the

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[5] The current sample contains no examples of either medial or labial flange vessels and only a few (3-5) examples of z-angle bases.

carbonate tempered ware and to facilitate future technological analyses, the mica-bearing ceramics were placed in a separate late Preclassic ware, El Macho Micáceo.

Many of the decorative modes and surface finishes found within the more common Paso Caballo Waxy Ware are replicated in El Macho Micáceo. Common types include Pasadota Incised (equivalent to Laguna Verde Incised), Dolines Red-on-Cream (equivalent to Mateo Red-on-Cream, Adams 1971:28), and Copal Bichrome (equivalent to Plancha Black-on-Red, Adams 1971:28).

The Terminal Preclassic - The Pom Ceramic Phase

Ceramics belonging to the provisional Pom phase have been found in only a few locations across the site. Our current sample consists of approximately 900 diagnostic sherds and two complete vessels. With a single exception, all of this material was recovered from the southern sector of the site, with the largest deposits found in excavations in front of Strs. R-2 and R-4.

The Pom ceramic complex is marked by slight changes in vessel forms, an increase in the number of types falling within the El Macho Micáceo ware, and, most importantly, by the appearance of types and modes typically diagnostic of Terminal Preclassic assemblages elsewhere. These modes include Usulutan-style decoration on distinctive hooked-grooved rim plates, Aguila-like orange monochrome slips, the use of mammiform supports, and the initial appearance of polychrome decoration. In general, the addition of the Terminal Preclassic ceramics appears to augment, rather than replace, the existing Late Preclassic assemblage of the site, a phenomenon noted at sites elsewhere in the Peten (Brady et al. 1998; Culbert 2003).

No means independent of the ceramics exist for dating Pom at Piedras Negras. The initial date for this phase is established on the basis of comparisons with other sites. At Piedras Negras, the most diagnostic types of this period include Ixcanrio Orange Polychrome, Metapa Trichrome, and Sacluc Black-on-Orange. The types and modes defining the Terminal Preclassic at Piedras Negras all appear after about A.D. 150 at Tikal, Seibal, and Altar de Sacrificios. In the absence of other data, this is a reasonable date for the appearance of these materials at Piedras Negras. The end of this period is established by the appearance of Tzakol modes and types. On comparative grounds, the end of the Pom phase is estimated at about A.D. 350.

The appearance of the first undeniably local polychromes serves as a distinct marker for the Pom phase. In general, the decoration found on this type, Otatal Orange Polychrome, is limited to paired lines executed in red and black over an Aguila-like orange slip circling the interior or exterior of shallow plates. This combination of slip, palette, and design organization is restricted to this period at Piedras Negras and is similar to the slip and decoration found on Terminal Preclassic vessels from Altar de Sacrificios (Adams 1971, Figures 26b, c; also Culbert 1993, Illustration #22). It is important to point out that this style of decoration appears on the exterior and interior of z-angle dishes at Altar, a form completely absent from Piedras Negras.

Pom is characterized, however, by the appearance of vessel forms that are uncommon or absent elsewhere in the Peten and are unknown in Abal phase deposits. These include shallow dishes with incurving walls and interiorly thickened rims and dishes with composite profiles and thickened and nearly vertical rims. Though our sample of these vessels is not large, they may represent the beginning of a local style resulting from Piedras Negras' isolation from Central Peten trends. The paucity of data from sites further to the west prevents us from making further comparative statements regarding Piedras Negras ceramic position at this time in its history.

The Early Classic

In examining the ceramic transition from the Preclassic to the Early Classic at Piedras Negras, the impression derived is one of abrupt and complete replacement. Except for the occasional appearance of Aguila-like slips in Pom phase deposits, there is no clear relationship between Preclassic and Early Classic modes at the site. Even the micacious pastes characterizing a significant portion of the Preclassic Ceramics disappears.

The impression of abrupt change between the Preclassic and Early Classic is heightened by the lack of a clear stratigraphic relation between deposits dating to this period. In the few places where Early Classic materials are found stratified above Preclassic ceramics, the sample is too small and too eroded to be of much use in clarifying the nature of the transition from Preclassic to Early Classic. The dramatic difference in the distribution of Preclassic and Early Classic ceramics further reinforces the impression of complete replacement.

Unlike Preclassic ceramics Early Classic ceramics have been found in every sector of the site. Early Classic ceramics have been found in contexts stratified above Preclassic ceramics and below inarguably later materials. The Acropolis, the residential groups found at the far northern end of the site core (Gillot et al. 2000; Jackson 2001), and residential groups outside the site core all contained Early Classic ceramics.

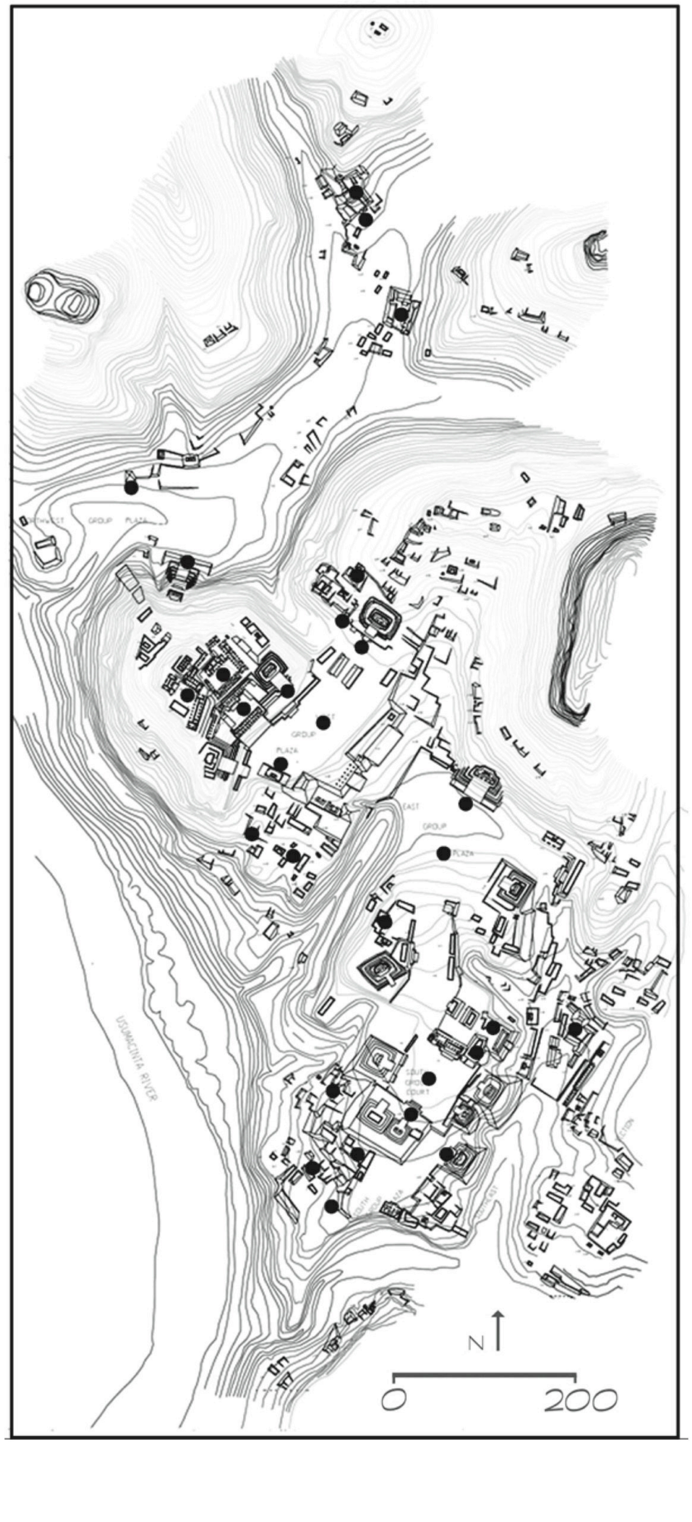

Figure 4.7 Map showing the location of Early Classic contexts at Piedras Negras. The black dots mark locations where Early Classic ceramics were found.

In many cases, the Early Classic ceramics of Piedras Negras are found immediately above bedrock and mark the initial construction of a large number of monumental structures, including an Early Classic palace buried under the West Group Court. Early Classic ceramics are also found within the fill of Strs. R-2, R-3, and R-5. The appearance of Early Classic ceramics in these contexts suggest that the differences in their distribution and quantity relative to Preclassic materials was as much the result of changes in sociopolitical organization as population growth.

The Naba Ceramic Phase

Naba is the single Early Classic phase at Piedras Negras. The typological similarity between the Piedras Negras Early Classic assemblage and contemporary assemblages from elsewhere in the Lowlands provides the principal means for dating this phase. The appearance of Peten Gloss Wares and the appearance of distinctive vessel form modes, including basal flanges, hollow conical supports, and bolstered rims on utilitarian vessels indicate that this phase is equivalent in time and typological content to Tzakol 2 and Tzakol 3 assemblages from elsewhere in the Peten. This estimate is in agreement with absolute dates derived from an examination of inscriptions associated with Early Classic architecture in the South Group Court, and with a carbon date derived from a late Early Classic termination found in Acropolis (Golden 2002, refer to Table 1 - AA 41370).

Stelae 29 and 30, both found in the South Group Court and associated with structure R-3 and R-4 respectively, bear dates of A.D. 539 and A.D. 534. The University Museum excavations as well as the BYU/del Valle excavations recovered small samples of Early

Classic materials both from within the fill of the platform supporting these structures as well as from the fill of Strs. R-3 and R-4 (Child and Child 2001c; Escobedo and Zamora 2001a; Holley 1983:80; Urquizu 1998a, 1998b). Stela 29 was recovered from the summit of Str. R-3 and provided a “no later than” date for the materials recovered from within the fill of this building. All of the ceramics recovered from these excavations fit well within the stylistic canons defining the Tzakol ceramic sphere.

A carbon sample from a termination deposit found in Acropolis Court 1 provided a calibrated date of A.D. 561 (AA41370, Stuiver and Reimer 2000). On typological grounds, it is estimated that this deposit contained ceramics manufactured late in the Early Classic. The ^{14}C date not only confirmed the age of this particular deposit, it also provided a “no later than date” for the ceramic types comprising the Naba complex. Because this termination was found overlying the final Early Classic structure at this location and beneath materials that were clearly Late Classic, the use of the radiocarbon date A.D. 560 as the terminal point for the Early Classic at Piedras Negras is reasonable.[6]

Orange monochromes dominate most Naba assemblages, though monochrome blacks and browns are also common. Zoned fluting and fine-line incising are common decorative modes, although a few examples of carved or gouged decoration are known. In most respects, these examples are indistinguishable from analogous types, such as Lucha Incised and San Clemente Gouged-Incised, found elsewhere (Figures 4.8 and 4.9).

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[6] Interestingly, this date agrees with the date of a possible warfare event at Piedras Negras waged at the behest of the ruler of Pomona. This event is recorded at Pomona and may correlate with the destruction of the Early Classic palace, whose remains lie buried beneath the West Group Court. The shift in modal frequencies and types marking the Early Classic to Late Classic transition at Piedras Negras may therefore have been a reflection of more profound social and political changes happening at Piedras Negras and marked in a variety of media (Golden 2002).

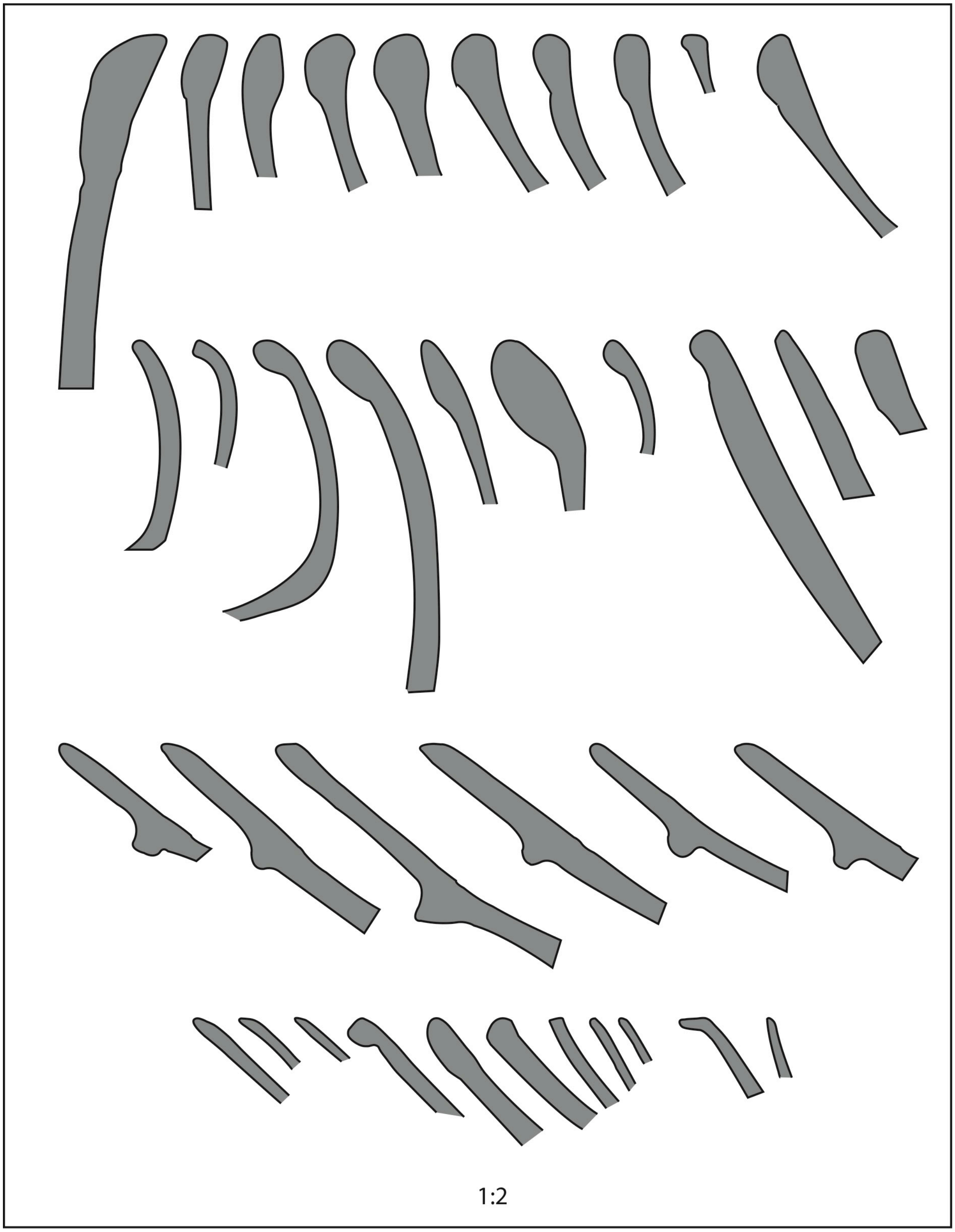

Figure 4.8 Early Classic profiles. (Illustrations by René Muñoz)

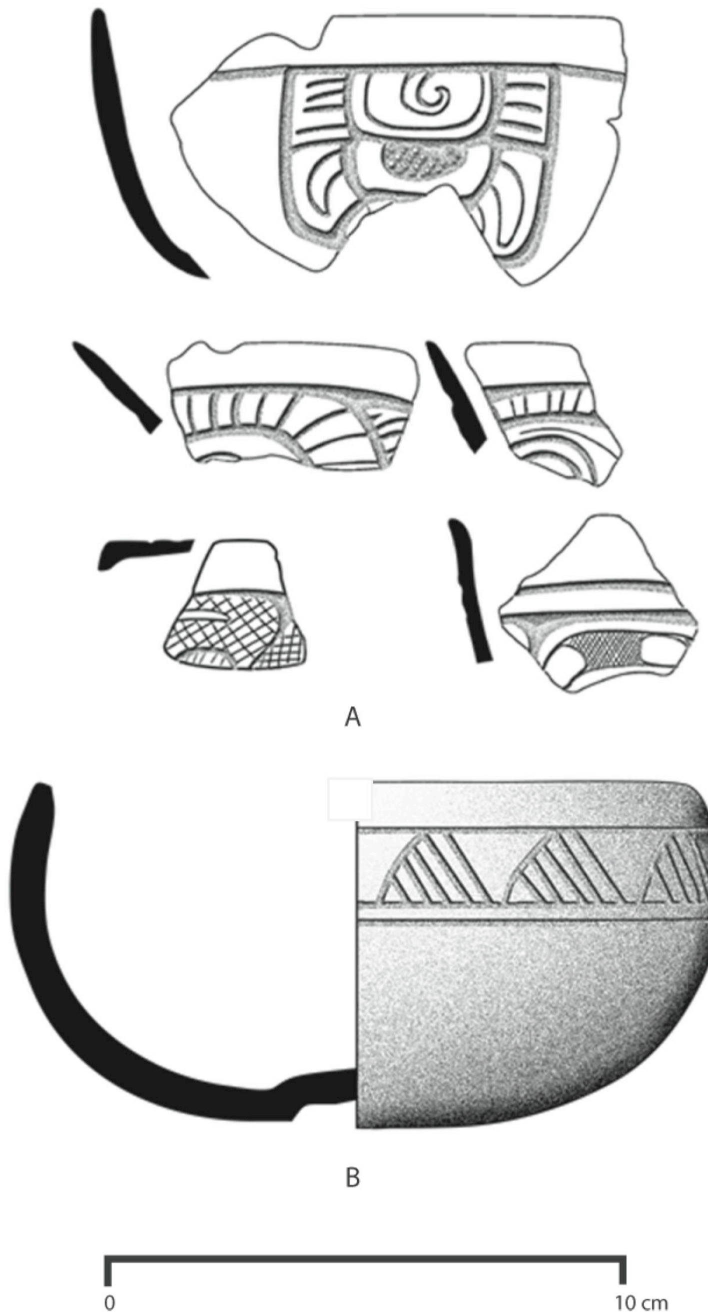

Figure 4.9 Examples of Contrabandista (top) and Lucha Incised from Piedras Negras. (Illustrations by Mary Jane Acuña and René Muñoz)

The major feature differentiating the Naba complex from contemporaneous complexes elsewhere in the Lowlands is the absence of the ring base, basal flange bowls that are a common Tzakol 3 diagnostic at many sites in the Peten. At Piedras Negras, shallow, basal ridge dishes with hollow, tripod supports replace this form. These plates are frequently monochrome, though polychrome decoration is also common. The majority of all polychrome decoration is executed on the interior of the plates and consists of parallel sets of circumferential lines, executed in red and black. These lines occasionally frame paintings of stylized birds. Thus type, designated Otatal Orange Polychrome, is functionally equivalent to the Dos Arroyos Orange Polychromes known from elsewhere, but is distinguished from that type on the basis of form and decoration (Figure 4.10). Given the close correspondence between Naba assemblages at Piedras Negras and elsewhere in the Peten, the reasons for the absence of typical Dos Arroyos polychromes is unclear.

On assemblage and stratigraphic evidence we are able to facet Naba into early and late periods (Acuña 2004). Late Facet Naba extends from approximately A.D. 500 to A.D. 560 and is marked by changes in the decorative program of basal flange plates. Early Facet basal flange plates tend to have multiple line exterior decoration, multiple line interior decoration including pendant loop and “U-chain” decoration, and flange and/or rim decoration consisting of black or red semi-circles. Late facet polychromes are also marked by an increase in the frequency of stylized birds and the simplification of exterior decoration. Other late facet markers include the occasional presence of cream primers on vessels, the initial appearance of cream polychromes (e.g. Yaloche Cream Polychrome), and the initial use of specular hematite paint on polychrome vessels.

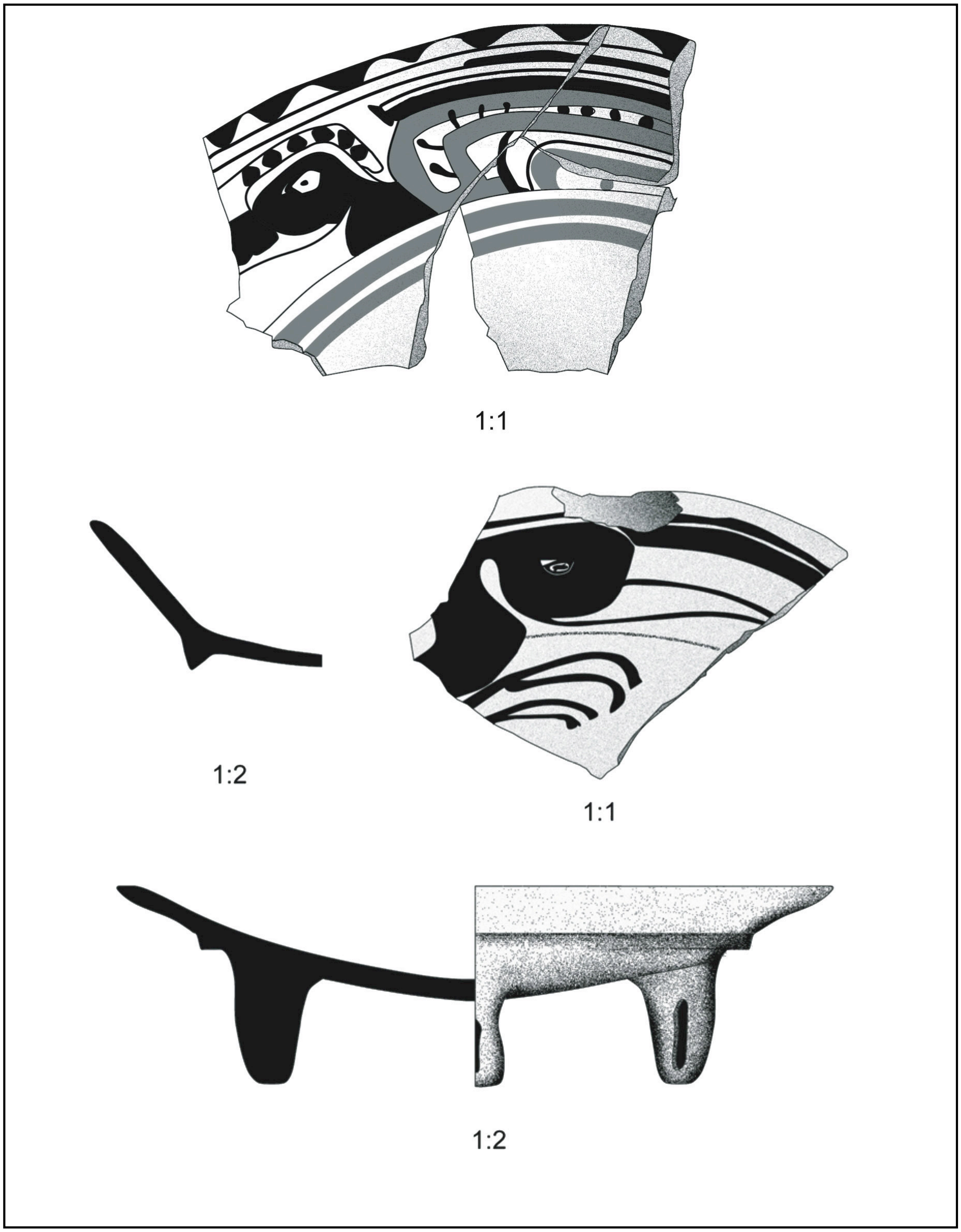

Figure 4.10 Examples of Otatal Orange Polychrome from Piedras Negras, showing typical interior motifs and vessel forms. (Illustrations by René Muñoz)

The end of the Naba phase marks a major break in the ceramics of Piedras Negras. While this break almost certainly reflects social and political changes occurring at Piedras Negras, it may also reflect wider social and political divisions. Beginning with the succeeding Balche phase, the ceramics of Piedras Negras begin to undergo a rapid period of change culminating in the development of a regional ceramic style with no clear analogs elsewhere in the Maya Lowlands. This development corresponds with changes both within and without the site. At Piedras Negras, the Late Classic marks a major shift in settlement within the site. The South Group Court, long the focus of settlement at Piedras Negras, was abandoned as the Acropolis became the center of royal activity. At the same time, the rest of Piedras Negras began a rapid expansion, quickly filling the narrow valley defining the site core, and spilling into the surrounding countryside.

The Middle Classic - The Balche Ceramic Phase

The Balche phase is equivalent to late Tzakol 3 and early Tepeu 1 and is estimated to last about 70 years, from A.D. 560 to A.D. 630. Balche ceramics have been found in 21 locations across the site, unmixed and in good stratigraphic context with both earlier and later materials. Balche phase ceramics are often associated with the major renovation of existing structures. For example, the nearly two meters of mixed Naba and Balche materials excavated from the northern end of the West Group Court (Escobedo 1998) likely represents the expansion of the West Group Court following the destruction of the Early Classic palace in preparation for the construction of K-5-2nd. Another large deposit of Balche material was recovered from a termination deposit in front of Str. F-2 (Wells 1999).

Despite its short span, dating the Balche ceramic phase proved unproblematic. First, in comparing the Balche complex ceramics with those of other sites, we observed a great deal of similarity between the Balche ceramics of Piedras Negras and the Chixoy and Veremos ceramics of Altar de Sacrificios. These observations accorded very well with the carbon date derived from the termination event excavated in Acropolis Court Three. This date, A.D. 561, provided us with an absolute date useful for marking the beginning of the Balche phase. Holley (1983:85) notes that the erection of Stela 25, dated to A.D. 608, capped several layers of construction, the earliest of which contained Balche complex ceramics. This indicates that the transition in modal frequencies marking the Balche ceramic complex must have taken place sometime before A.D. 608. Stela 26 (dated A.D. 628) and Stela 33 (dated A.D. 638) are both associated with ceramics belonging to the succeeding Yaxche ceramic phase. The transition in modal frequencies marking the end of the Balche must have taken place most likely between A.D. 608 and A.D. 628. Given this, the end of the Balche ceramic phase is placed at about A.D. 620.

Balche diagnostics include the use of specular hematite, a reduction in the size and orientation of basal flanges, changes in the size and shape of hollow supports, and the appearance of painted glyphs or pseudoglyphs on bowls and plates. Hemispherical bowls, bowls with composite walls, and dishes with slightly everted lips are common forms. Other representative forms include slipped and unslipped jars with bolstered and grooved rims and dishes with slipped interiors, smoothed exteriors, and hollow supports (Figure 4.11).

Figure 4.11 Balche profiles. (Illustrations by René Muñoz)

The use of resist decoration is perhaps the most diagnostic mode for Balche. During the Early Classic, this technique is rarely used and is generally confined to the exteriors of bowls, where it is employed to produce bichrome (gray-on-cream) geometric designs. By Balche, resist decoration is more common and has developed into an elaborate polychrome technique. Vessels decorated using this technique usually consist of a dark orange or red slip over a resisted cream under-slip, with design details executed in positively applied black paint. Mataculebra Cream Polychrome is the most common type utilizing this decorative technique. Other important diagnostic types utilizing similar decorative techniques include Moro Orange and Suktan Cream Polychrome (Figure 4.12).

Both Mataculebra and Moro are known elsewhere in the Maya area. Mataculebra was first identified as a type at Altar (Adams 1971:41), though clear examples of this type can be found as far away as the Western Highlands. Moro was first identified at Becan (1977:74; Ball 1978:136) and may have a Gulf Coast provenience. Suktan Cream Polychrome, in contrast, appears to be a local type and demonstrates the most elaborate decoration of the Balche resist types.[7] Additionally, few positive painted types related to Palmar/Saxche materials found elsewhere in the Peten occur at Piedras Negras. In comparative perspective, the Piedras Negras examples are notable for the limited palette and motifs employed in their decoration. Overall, the sense is of increasing separation from Peten decorative modes, and the development of a style unique to Piedras Negras. This development reaches its apogee in the ceramics of the Yaxche ceramic phase.

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[7] A Suktan Cream Polychrome bowl was found at La Joyanca, Peten It is nearly identical to Piedras Negras examples, although the form is unusual(Melanie Forné, personal communication 2003). The appearance of this type suggests the direction and extent of a possible ceramic sphere centered on Piedras Negras.

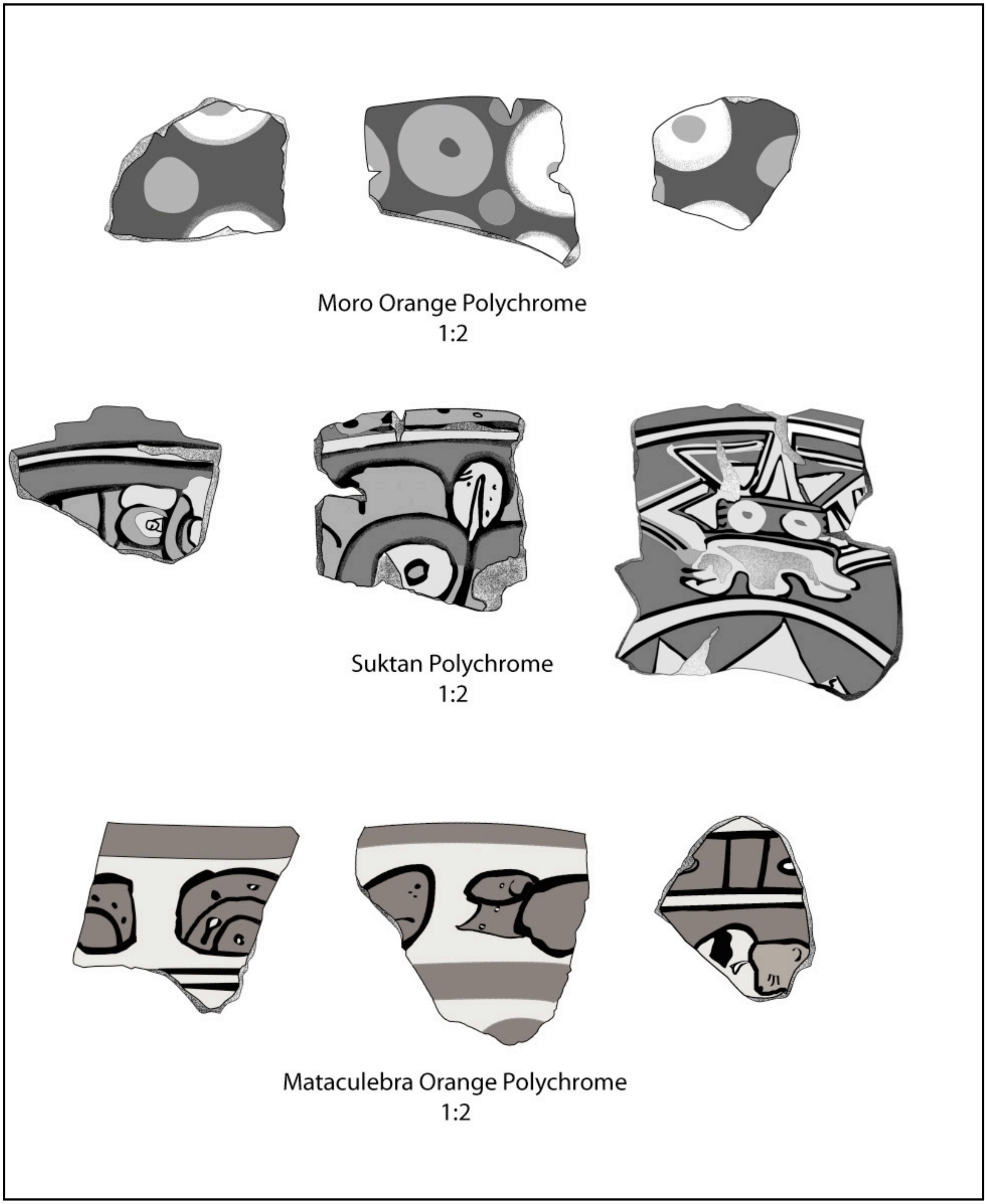

Figure 4.12 Examples of Moro, Suktan, and Mataculebra polychromes from Piedras Negras. (Illustrations by René Muñoz)

The Late Classic

The Late Classic at Piedras Negras is divided into four ceramic phases stretching from A.D. 630 to approximately A.D. 900. While the initial date of the Late Classic is well established on the basis of absolute dates and comparison with other sites, the terminus of the Late Classic is much more difficult to establish. The final ceramic phase at Piedras Negras, Kumche, is well defined typologically, but because it represents the abandon-ment of the site, we have no means for establishing an absolute date for its end, a problem recognized for other sites in the Maya Lowlands (see Smith 1955).

Yaxche

Yaxche is the first fully Late Classic ceramic complex at Piedras Negras. Yaxche ceramics have been found in large quantities in all areas of the site, including the peripheral residential groups, in sealed contexts, below later (Chacalhaaz) materials, and in association with dated monuments. Almost all Yaxche phase ceramics were recovered from mixed contexts, although large lots of unmixed Yaxche material were found in several locations across the site. The most important of these were deposits of early Yaxche materials found in a residential group located just below the Acropolis (Operation 24b, Arredondo 1999a), and in a residential group located in the southern end of the site (Operation 23b, Romero 2000).

Forms reminiscent of those found in the central Peten are common, although surface decorations become increasingly differentiated (Figure 4.13). During this period, resist decoration is the predominant polychrome mode. The rarity of positive painting, the prevalence of resist decoration, the introduction of modeled and carved ceramics and the distinctive form and finish of utility vessels lend a unique tenor to Yaxche ceramics.

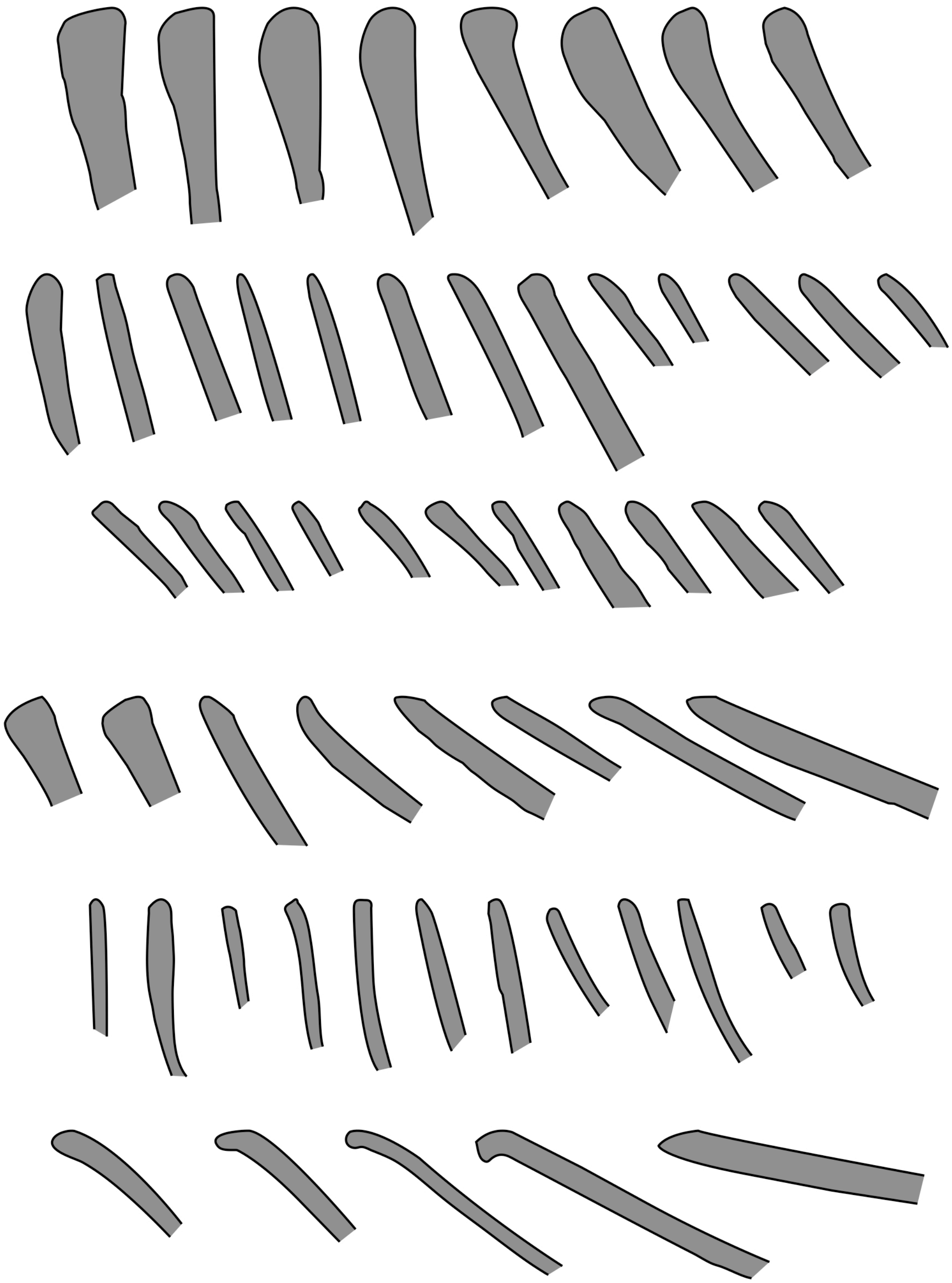

Figure 4.13 Yaxche Basin, Bowl, and Plate Profiles. (Illustration by René Muñoz)

Santa Rosa Cream Polychrome is the most diagnostic type for this period (Figure 4.14). Though originally identified at Altar (Adams 1971:42), it is more variable and frequent at Piedras Negras. Santa Rosa is the most common of several resist types dominating the Yaxche complex. Other resist types include Mataculebra, Lemba, and Suktan polychromes. The changing frequencies provide a means for faceting Yaxche. Mataculebra is more common during the Early Facet, while Lemba and Suktan are more frequent during Late Facet Yaxche, though they are both found during Balche and Early Facet Yaxche periods.

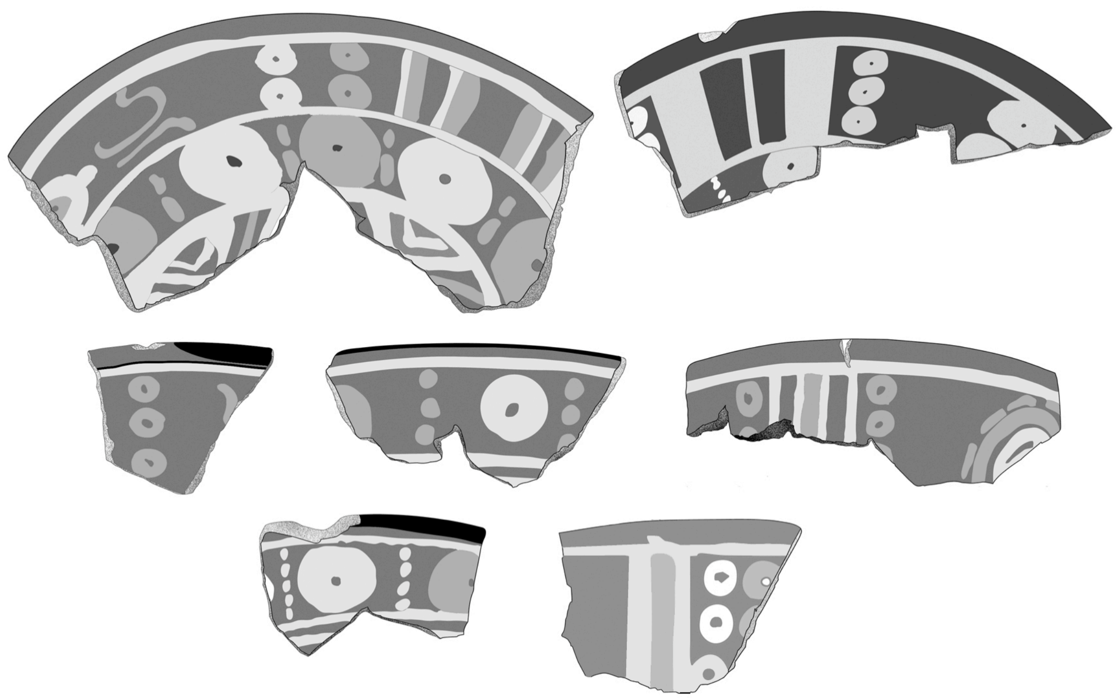

Figure 4.14 Santa Rosa Cream Polychrome. Scale is approximately 1:2. (Illustrations by René Muñoz)

Positive painted polychromes are relatively commons during early facet Yaxche. The most common decorative motif consist of bands of pseudoglyphs executed in combinations of black and red applied below the rims of bowls (Figure 4.15). Another major diagnostic of the Yaxche phase is the use of incised decoration on the exteriors of cylinders and composite wall bowls. Common motifs include pseudoglyphs, abstract geometric designs, and iconographic representations of flowers or jewels (K. A. Taube, personal communication 2002). Legible glyphs on the exteriors of composite wall bowls are known, but are rare (Figure 4.16). In some cases, an incised design may be combined with resist decoration. This combination is limited almost exclusively to early facet Yaxche.

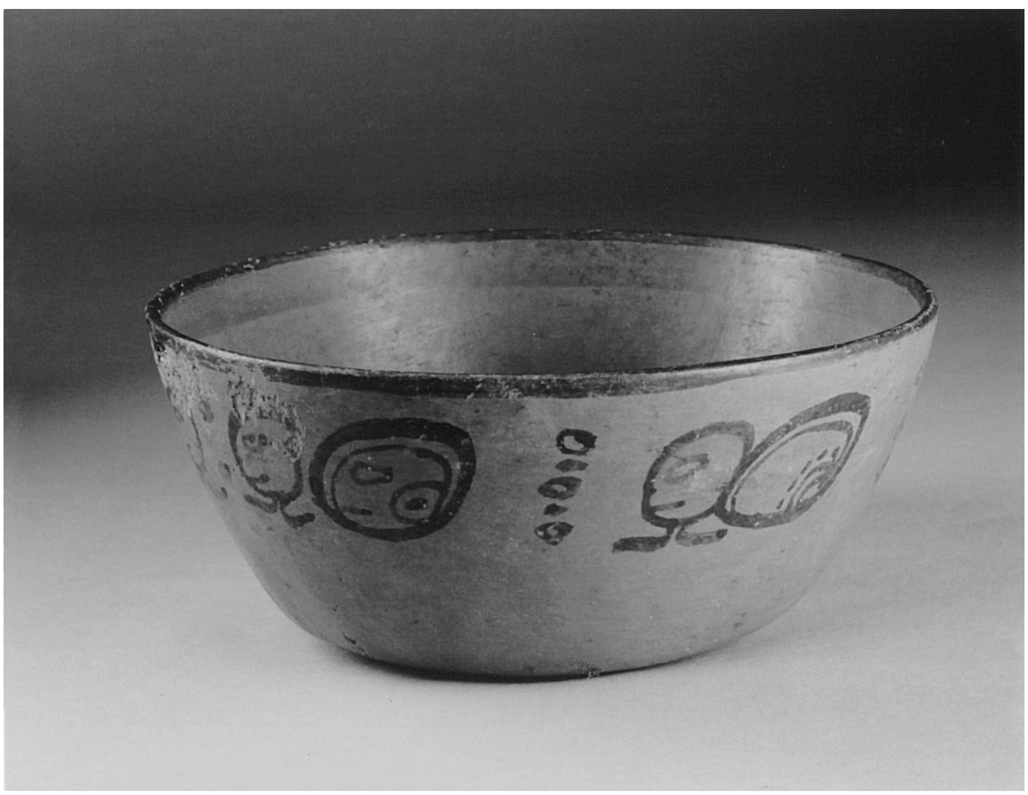

Figure 4.15 An example of Saxche Orange Polychrome from Piedras Negras. Diameter = 17.5 cm. (Photograph Courtesy of Jorge Perez de Lara)

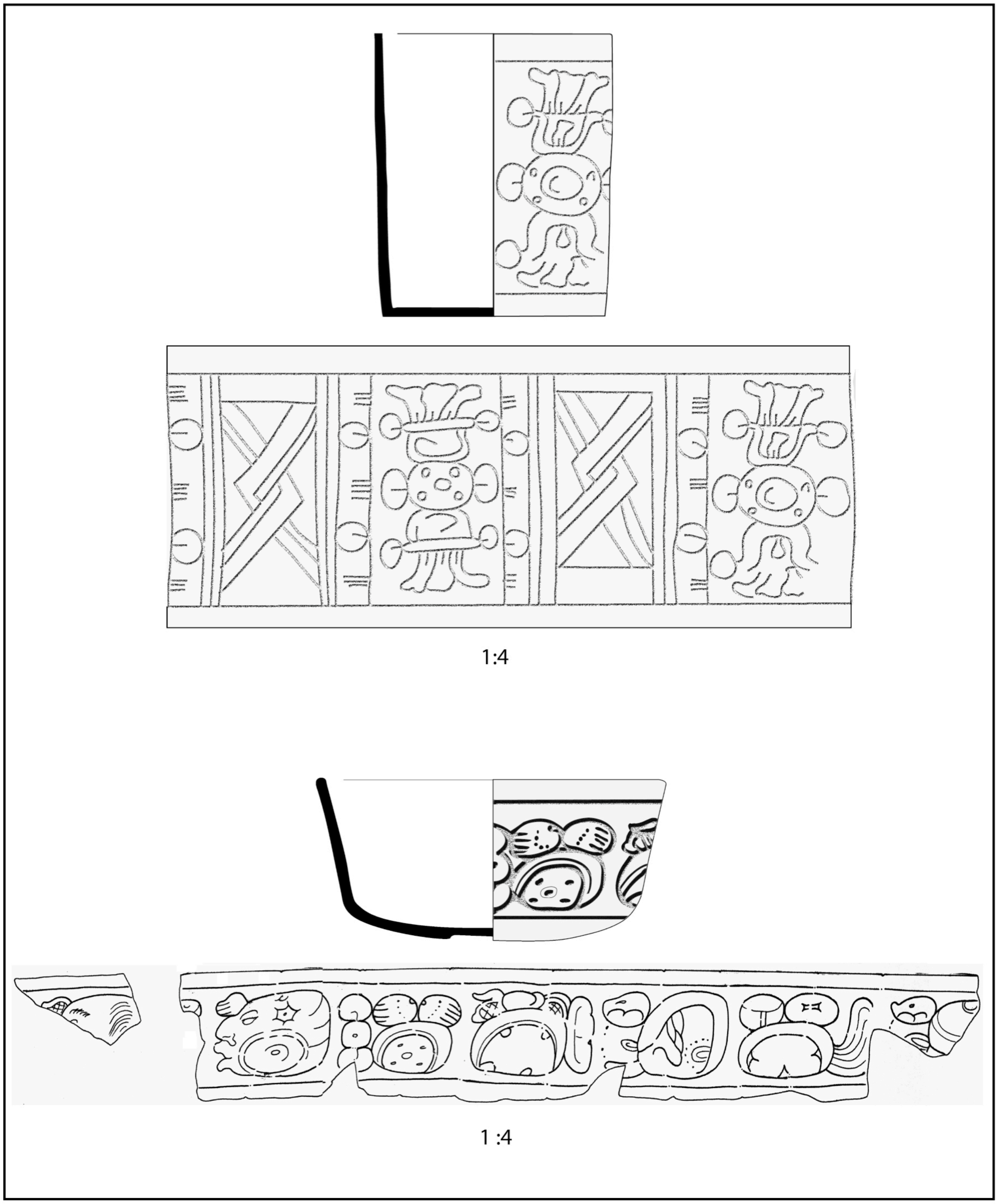

Figure 4.16 Examples of Nacimiento Incised (top) and Paqal Incised (bottom). The inscription on the bowl reads, “His Drinking Vessel, Itzam K’anahk” (Stephen Houston, Personal Communication 2000). Itzam K’anahk ruled Piedras Negras A.D. 639-686. (Illustration of Nacimiento Incised by James Fitzsimmons, Paqal Incised illutration by René Muñoz [vessel] and Stephen Houston [roll out]).

The transition from the Yaxche ceramic phase to the succeeding Chacalhaaz phase was established on the association between Stela 11 and the ceramics found with the construction fill of the supporting terrace, and the initial appearance of Chablekal Fine Gray ceramics at the site. Stela 9 bears a date of A.D. 731. The fill from the supporting terrace contained ceramics displaying a combination of Yaxche and Chacalhaaz modes. We interpreted this as indicating that this deposit was likely of late Yaxche date, and that the transition in modal frequencies marking the division between the Yaxche and Chacalhaaz ceramic phases must have occurred after this time.

Excavations in front of Str. J-20, near Altar 2 (dated A.D. 751), substantiate this observation. Work here produced Chacalhaaz ceramics from beneath the final plaza floor - the same floor supporting Altar 2, the earliest monument associated with Chacalhaaz ceramics. This indicates that the transition from Yaxche to Chacalhaaz must have been complete by about A.D 750. The date on Altar 2 in combination with the date on Stela 11 (A.D. 731) produce a nineteen-year interval during which the transition in modal frequencies marking the beginning of the Chacalhaaz ceramic phase must have occurred.

At Piedras Negras, Chablekal Fine Gray is known predominantly from Chacalhaaz contexts, though it is occasionally recovered in good context with Yaxche ceramics. Chablekal Fine Gray appears in the Palenque region no earlier than about A.D. 730. Given this, it seems reasonable to conclude Chablekal ceramics did not enter Piedras Negras prior to A.D. 740. Given the earliest contexts in which Chablekal appears at Piedras Negras and the date on Altar 2, we feel most comfortable ending the Yaxche phase at about A.D. 750.

After this time, we see a significant increase in the amount of Chablekal Fine Gray at

Piedras Negras, a trend in good agreement with the pace and timing of its appearance at other sites in the Maya Lowlands. The increased frequency of Chablekal Fine Grays correlates with a general shift in the ceramics of Piedras Negras. After about A.D. 750, the use of resist decoration becomes less common and positive painting reasserts itself as the dominant decorative mode. This shift in decorative technique, along with changes in decorative motif and vessel form, mark the beginning of the Chacalhaaz ceramic phase.

Chacalhaaz

Chacalhaaz is the penultimate ceramic phase at Piedras Negras and lasts approximately 100 years, from A.D. 750 to A.D. 850. Chacalhaaz ceramics are found in great quantities in all areas of the site, including every peripheral residential group. Because Chacalhaaz is the final construction period at Piedras Negras, much of the material that would have been incorporated into building fill remained in primary context. Furthermore, the material incorporated into fill is often unmixed with earlier ceramics. Much of the primary debris consists of trash filling the rooms of several structures on the Acropolis, as well as in the Northwest Group Court (Child and Child 2000;a Jackson 2001).

In the Northwest Group, it appears that massive amounts of trash were intentionally piled into the interiors of rooms. In one case, it appears that this trash may have been deposited as part of a termination ritual - several complete censers were found, upright and resting on the floor, buried beneath nearly a meter of refuse (Jackson 2001). On the Acropolis, trash was found filling several of the rooms and spilling onto the stairway of monumental sweat bath Str. J-17, a situation analogous to that described by University Museum excavators clearing Acropolis Str. J-2 in the 1930s (Unpublished field notes, University Museum).

The initial date of the Chacalhaaz phase is well established on the association between dated monuments, sealed ceramic deposits, and the appearance of particular ceramic modes. The terminal date of Chacalhaaz is much more difficult to establish. The ceramics found inside Str. J-12 (ostensibly destroyed in A.D. 808) were Chacalhaaz. However, in the absence of further historic data, it is difficult to determine how many years beyond this point Chacalhaaz ceramics continued in use or even how much longer occupation continued at Piedras Negras. Fortunately, the appearance of Tres Naciones Fine Gray and Fine Orange pottery provides a clue to resolving this problem.

Tres Naciones Fine Gray and Fine Orange appear at Seibal no later than about A.D. 830. At Seibal they are found in association with at least one dated monument and with a number of ceramic types found in securely dated contexts at other sites. At Piedras Negras, Tres Naciones Fine Gray and Fine Orange are generally found in surface contexts and with pottery clearly analogous to Terminal Classic types elsewhere. This presents us with a means for marking the division between the Chacalhaaz and Kumche phases. Because we feel that some of the ceramic innovations marking the Terminal Classic were slow to arrive at Piedras Negras, we have placed the end of Chacalhaaz at about A.D. 850.

The Chacalhaaz ceramic phase is defined by major reduction in the frequency of resist and resist-reserve decorated ceramics, and an increase in the frequency and variety of positive painted polychromes. Red bar polychrome, a common Tepeu 2 marker elsewhere in the Peten, appears at Piedras Negras at this time. At Piedras Negras this type, Bolonchac Orange Polychrome, dominates the Chacalhaaz polychrome assemblage and is found in almost every lot of Chacalhaaz ceramics.[8] The red bars are typically found adorning the exteriors of shallow plates with and without tripod supports. A few examples of this type also have decorated interiors. Unfortunately, the interiors are often so eroded that it is impossible to make out the design, though one well-preserved example is decorated with a leaping fish (Figure 4.17).

Monkeys, typically seated, with a single arm outstretched and palm upturned, are also a common motif and often adorn the exterior of large serving vessels (Figure 4.18). Though the ultimate origin of this mode is unknown, the clearest analogs at Piedras Negras are found on examples of Telchac Composite, a fine paste type originating on the Tabasco Plain. The vessels decorated with monkeys, either carved or painted, often have a diagnostic form. Typically they are 45-60 cm in diameter and 12-15 cm deep, with divergent walls, broad everted rims, and hollow tripod supports. The great size of these dishes points to a trend that may also be diagnostic of Chacalhaaz. Comparing functionally equivalent forms between Yaxche and Chacalhaaz, the increase in vessel size across all forms is quite obvious. Chacalhaaz serving dishes as well as storage and cooking vessels all appear to increase dramatically in size and appear more heavily built than those common in the preceding phase. Other important changes in vessel form include the appearance of in-curving basins with bolstered rims, straight-sided basins with thickened triangular rims, bowls with out-curving walls, and shallow, unslipped plates resembling comales.

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[8] Compare to Anonal Orange Polychrome (Adams 1971:Figure 61) and Jacap Orange Polychrome at Tonina (Bequelin 1979:Figure 173). Red bar decoration also appears at Seibal and Uaxactun, though at those sites, the red bar motif appears on more than a single type. Red bar decoration has also been found on an as yet unnamed type at La Milpa (Kerry Sagabiel, personal communication 2003).

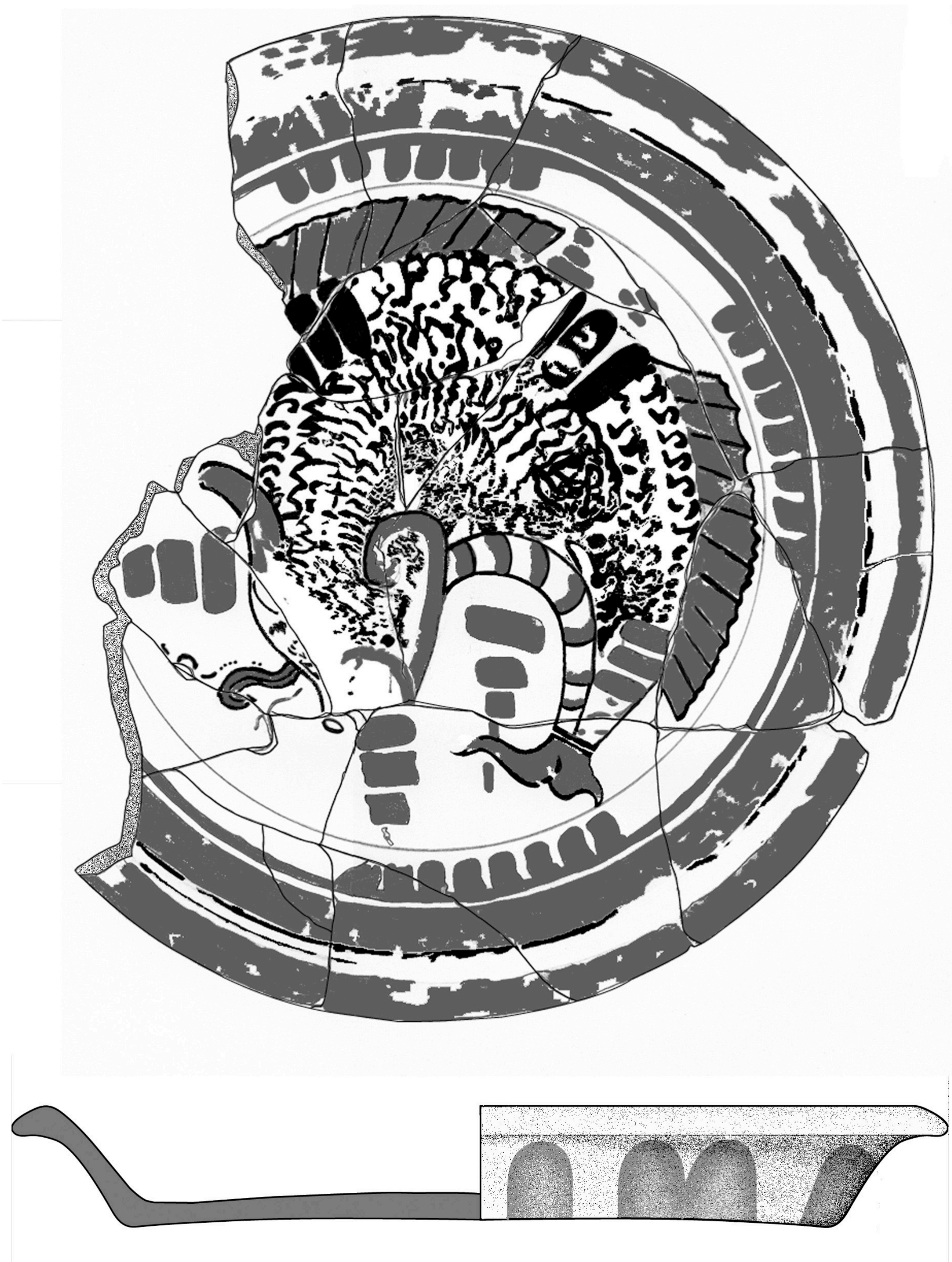

Figure 4.17 Bolonchac Orange Polychrome: Guapaque Variety. Interior decoration is of a leaping fish. Scale = 1:2. (Illustration by Elizabeth Mencos)

Figure 4.18 Hutzijan Polychrome, Incised and Positive Painted varieties. Top and middle examples are incised. Interiors are often decorated (see Figure 4.19). Lower example is painted. Scale is approximately 1:2. (Top and Middle illustrations by René Muñoz, lower illustration by Stephen Houston)

Figure 4.19 Hutzijan Polychrome, interior. Interiors on most examples are highly Eroded and decorations are indiscernible. (Photograph by Charles Golden)

Resist decoration and Chablekal Fine Gray are both common modes during early facet Chacalhaaz. While the ubiquity of resist decoration almost certainly reflects the development of a regional ceramics style, the presence of Chablekal Fine Gray as well as the presence of a number of other imported fine pastes give some indication of the external relations maintained by Piedras Negras during the late eighth century. Though the results of geo-chemical analyses are still pending, it is clear that a great deal of the fine pastes ceramics found at Piedras Negras were manufactured in the Palenque region.

The change in ceramic modes following this event, particularly the disappearance of Chablekal Fine Grays, allows us to define a Late Facet Chacalhaaz. Several sealed deposits that stratigraphically must post-date this event do not contain resist-reserve ceramics, Chablekal Fine Gray or true Fine Orange ceramics. These deposits are marked by an overall increase in serving and storage vessel size, as well as changes in rim form that are best described as exaggerations of previous modes - triangular basin rims, for example, remain common, but are much more angular in profile, and become increasingly broad relative to vessel wall thickness. Late facet Chacalhaaz pastes take on a deep red tone uncommon in earlier time periods and are increasingly fine, though carbonate temper is still common.

Nearly every excavation at Piedras Negras produced material dating to this period, and almost every major structure at the site was modified in some way at this time. The end of the Chacalhaaz ceramic phase also marks the demise of Piedras Negras as a major political power in the Usumacinta basin. This decline is marked by the rapidly declining populations, the end of the dynastic sequence, the cessation of monument erection, and the abandonment of many of the most important structures at the site, though it appears as if some ritual activity may have continued - a midden excavated behind temple Str. O-13 produced large amounts of Late Chacalhaaz ceramics, and Late Chacalhaaz sherds were incorporated into the plaster façade of that structure. These activities quickly came to an end, however, as populations declined and Piedras Negras fell into a state of near abandonment.

Kumche

Kumche is the final ceramic complex at Piedras Negras and marks the abandonment of the site. The beginning of the Kumche ceramic phase is manifested principally by the introduction of Tres Naciones Fine Gray and Altar Fine Orange types into the site sometime around A.D. 850. The end of this phase, however, is impossible to determine with any certainty. Given the amount and distribution of Kumche material, occupation at this time was short-lived, perhaps no more than 50 to 75 years.

This precipitous decline in population begun during the Late Chacalhaaz was accompanied by changes in the organization of settlement. During Kumche, settlement contracted and was limited to just a few areas of the site, including portions of the South Group Court (Child and Child 2001c), the Northwest Group Court (Jackson 2001), and Court 4 of the Acropolis (Golden et al 2000; Golden and Quiroa 2001). In the South Group Court, Kumche remains were identified primarily through the presence of fine orange pottery and locally manufactured wares in surface scatters found among the remains of a very late colonnaded building. Excavations here (Child 2001c) recovered a near complete fine orange vessel (Trapiche Incised) along with sherds representing at least two other Tres Naciones Fine Gray vessels.

In the Northwest Court, an interior room of least one structure was intentionally filled with Kumche phase garbage and ceramics (Jackson 2001). Some imported fine paste pottery, including an example of Provincia Plano-Relief, was found here mixed with large amounts of locally-made pottery. The presence of so much locally-made pottery in good context with Terminal Classic allowed us to identify Kumche phase ceramics in other areas of the site independent of the presence of imported fine pastes. This was key in identifying the large amount of Kumche phase ceramics found in Court Four of the Acropolis.

Excavation in Court Four of the Acropolis (Golden et al. 2000; Golden and Quiroa 2002) encountered the remains of a Terminal Classic household identified primarily through a number of stratigraphically late burials and the large amounts of garbage deposited in a narrow alleyway between two buildings. No fine paste ceramics were found in this deposit. The deposit did yield, however, a large amount of locally-manufactured pottery demonstrating Terminal Classic traits. These traits included finely tempered bowls with parallel incised lines immediately below the rim, and bowls and jars with grooved rims.

Other diagnostic modes for Kumche include basins with triangular rims, near-vertical exterior walls and slightly in-curving profiles, the use of hollow, zoomorphic supports and/or notched basal ridges on shallow plates, everted and grooved rims on unslipped utility forms, and vertical or slightly bulging necks on both slipped and unslipped jars. Kumche polychromes are generally poorly preserved and nothing equivalent to the Terminal Classic polychromes, such as Lombriz Orange Polychrome (Adams 1971:39), known from other sites is recognized at Piedras Negras. Instead, this period is marked by the continued presence of Bolonchac Orange Polychrome, and the complete disappearance of other polychrome types. We are also unable to describe with any precision the nature of the Terminal Classic to Post Classic transition at Piedras Negras, though it seems that at least some of the major ritual structures remained in use through this period - a probable midden containing Kumche materials was found behind the temple of Str. O-13.

The Post Classic

Because the Post Classic is so weakly represented at Piedras Negras, because there is no clear construction at Piedras Negras during Kumche, and because there is, as a result, no clear Terminal Classic to Post Classic stratigraphy at Piedras Negras, it is impossible to say with any precision when Kumche ends and the Post Classic begins at Piedras Negras. The University Museum Project recovered most of the Post Classic materials at Piedras Negras. The majority of this material consisted of "Lacandon" anthropomorphic censers recovered from the interiors of the temples in the South Group Court (see Figures 4.2, 4.3). The only possibly Post Classic material recovered by the BYU/del Valle project was a pair of bichrome plates cached beneath a collapsed wall in sweat bath Str. P-7 (Figure 20; Child and Child 2001a). These vessels have a fine paste, are clearly of non-local origin, and were almost certainly cached after a portion of the wall had collapsed. Vessels with very similar decoration are known from Chichen Itza (Brainard 1958: Figures 84-85; Smith 1971:Figure 23r, s, t, u, v) and date to the Early Postclassic. A carved jade bearing the name of Piedras Negras Ruler 7 was recovered from the cenote at Chichen Itza and suggests some late, long-distance contact between the two sites (Proskouriakoff 1974). This, in addition to the censers recovered by the University Museum Project, suggest that Piedras Negras may have been a pilgrimage center long after the final occupants left the city.

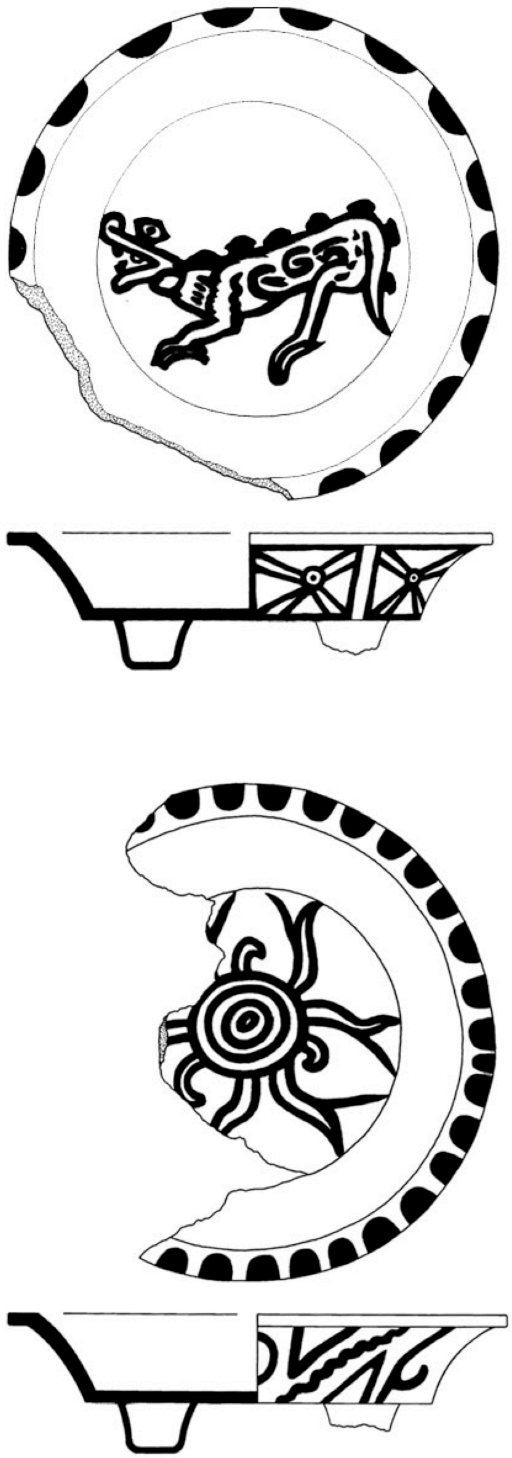

Figure 4.20 Two possible Postclassic plates found cached in Str.P-7. Scale is approximately 1:4. (Illustrations by Mark Child)

IMPLICATIONS OF THE PIEDRAS NEGRAS CERAMIC SEQUENCE

The ceramic history of Piedras Negras can be broken into three major periods - Founding, Expansion, and Collapse. Founding encompasses the Middle and Late Preclassic, and Early Classic (Hol, Abal, Pom, and Naba). Expansion covers part of the Early Classic and most of the Late Classic (Late Naba, Balche, Yaxche, and Early Chacalhaaz). The Collapse period includes late Chacalhaaz and Kumche. This section briefly reviews the history of Piedras Negras, focusing on the founding and collapse of Piedras Negras from a ceramic perspective. Because the Expansion period is the time of specific interest to this dissertation, it will be discussed in detail in the following chapter.

Founding I -Hol, Abal, and Pom

Only one unmixed deposit of Hol phase ceramics is known from Piedras Negras. These ceramics were recovered from a deeply buried deposit found in front of Str. R-5. The deepest levels of the excavations resulted in the recovery of midden containing 500+ sherds of Middle Preclassic ceramics, over 150 fragments of animal bone, numerous chert and obsidian flakes, as well as several lenses of carbon (Escobedo and Zamora 2000, 2001a, 2001b).

The lateral extent of this midden is unknown, but the stratum containing the Hol phase ceramics was approximately 50 cm thick and buried beneath 2.5 m of stratified Late and Terminal Preclassic debris. The Late and Terminal Preclassic strata were composed of the same black matrix and combination of ceramics and cultural materials as the Middle Preclassic stratum, again indicating that these strata were the remains of a trash dump, and that the area had been used as such for a substantial period of time.

The difference in elevation above bedrock between the stratigraphically equivalent plaza floor fronting Str. R-3 and R-4 and the plaza floor fronting the adjacent Str. R-5 is dramatic and suggests that the underlying topography of the area is quite hilly. This observation is matched by data from excavations in the residential south of Str. R-3 and R-4, where the plaza surface varies between .5 and 1.5 meters above bedrock. Given the topography of the area and the ethnographically observed practice of discarding trash down steep slopes (Hayden and Cannon 1983), it seems very likely that a Preclassic residence once stood near this midden and is likely buried within or immediately to the west of Platform R-32 and below Str. R-3 and R-4. Extensive excavations in this area have not located any other indications of Preclassic settlement or domestic architecture.

Middle Preclassic ceramics were recovered from a number of locations elsewhere in the South Group Court. However, these materials were invariably mixed with later, Abal phase ceramics. This is particularly the case with the ceramics recovered from the shallow deposits found within Platform R-32 in front of Strs. R-3 and R-4, and from most areas covered by the South Group Court Plaza. In contrast, excavation in these areas did uncover numerous unmixed deposits of Abal (Late Preclassic) ceramics. These were found in the fill of Str. R-3-2nd, from the fill of Platform R-32, from a substructure of Str. R-5, and near Strs. R-9 and R-10.

Small amounts of Late Preclassic ceramics have also been recovered from outside of the South Group Plaza. These ceramics were recovered from the fill of the C-Group Plaza (Arredondo and Gillot 2000) and from fill beneath Str. F-2 in the Northwest Group Plaza (Wells 1998). In both cases, the Preclassic ceramics were overlain by substantial quantities of Late Classic ceramics. The amount of Preclassic ceramics found in these locations was not great, but the large distance between this area and the South Group Court may represent an expansion of settlement out of the southern sector of the site during the Late Preclassic. This possibility is further suggested by the remains of a Late Preclassic bowl apparently cached on the Acropolis prior to the beginning of construction in Court Three (Golden 2002).

The presence of unmixed deposits of Abal phase ceramics, the presence of deposits containing mixed Hol and Abal phase ceramics, and the absence of Middle Preclassic architecture suggest that the construction of public buildings began at Piedras Negras sometime during the Late Preclassic and that it may have involved the demolition of some Middle Preclassic residences. These features were razed to provide fill for the creation of the South Group Court and the surrounding monumental structures. Evidence also suggests that these episodes of demolition and construction most likely took place toward the end of the Preclassic, during the Pom ceramic phase.

Pom represents a provisional Terminal Preclassic phase lasting approximately 175 years, from A.D. 175 to A.D. 350. This phase is defined primarily by the appearance of ceramics typically diagnostic of Terminal Preclassic and Tzakol 1 periods mixed with ceramics that would be otherwise identified as Abal. The fact that we cannot consistently identify Pom assemblages independent of Terminal Preclassic types (see Brady et al. 1998 for examples), and the absence of stratified Abal phase deposits allow the possibility that some lots otherwise identified as Abal may actually date to the Pom phase. The effect of this error would be to under-represent the total quantity Pom phase materials at Piedras Negras and skew our understanding of Piedras Negras' early development - we may be underestimating the amount of construction that took place during the Terminal Preclassic. Despite this, the fact that modes typically identified as Protoclassic I and II elsewhere in the Peten are found together at Piedras Negras strongly suggests that most of the known Preclassic construction at Piedras Negras took place during the Terminal Preclassic/Protoclassic II period.

Pom phase ceramics are found almost without exception in the same locations as Late Preclassic ceramics. Exceptions to this pattern include the appearance of a large quantity of Pom phase ceramics in the fill of a platform immediately south of the South Group Plaza and within the fill of Str. R-30, a small building south of Platform R-32 and behind Strs. R-3 and R-4. In addition to these contexts, Pom phase ceramics are also found within the fill of Str. R-3, and in the uppermost levels of the domestic midden found fronting Str. R-5.

The presence of Pom phase material in these contexts suggests that most of the South Group Plaza was originally constructed during the Terminal Preclassic, following a long period during which Piedras Negras was likely composed of several small residential complexes set on a level terrace above the maximum flood stage of the Usumacinta.[9] Areas with similar topography are used for agriculture on both the Mexican and Guatemalan sides of the river to the present day.

There is no doubt that the initial settlement of Piedras Negras took place during the

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[9] An extensive area of Late Classic settlement mapped by Zachary Nelson in 2000 immediately east of the South Group Court may contain the remains of further Preclassic settlement. These areas have not been thoroughly tested or excavated.

Middle Preclassic, but it is not clear when in the Middle Preclassic it was settled. The lack of deep Middle Preclassic stratigraphy, the complete absence of identified Middle Preclassic architecture, and the possibility that some of the Middle Preclassic ceramics from Piedras Negras may demonstrate traits transitional between Middle and Late Preclassic modes (Donald Forsyth, personal communication 2000) suggest that occupation was limited to the very end of this period.

The nature of the transition from Middle Preclassic to Late Preclassic settlement at Piedras Negras is difficult to understand. The presence of stratified Middle and Late Preclassic ceramics in the midden found in front of Str. R-5 would seem to indicate long-term, continuous occupation. However, it is difficult to imagine a period of some 600 years during which there was no appreciable change in settlement.

The only indication of changing settlement during the Late Preclassic are a few sherds of Abal phase ceramics recovered from the Acropolis, the C-Group, and Str. F-6 in the Northwest Group Plaza. However, this change in the distribution of ceramics (all Middle Preclassic ceramics were found in the South Group Plaza) is not matched by an increase in the overall quantity of Late Preclassic ceramics relative to Middle Preclassic materials. Instead, the opposite appears to occur - there is an overall decrease in the quantity of Preclassic ceramics.[10] Houston (Houston et al. 2003) has suggested that occupation throughout the Preclassic may have been sporadic, with parts of Piedras Negras being abandoned and (re)occupied throughout the Preclassic. While this is

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[10] This is measured by the total number of diagnostic sherds recovered as well as by estimates of the total number of vessels recovered. Total weight of sherds may be a more suitable measure, but that data was not recorded by lot, nor by phase or type.

possible, the overall paucity of Late Preclassic materials at Piedras Negras suggests that a declining population throughout the Preclassic may be more likely.

The possibility of declining population in the Late Preclassic, however, is contradicted by an apparent increase in the amount and scale of construction at Piedras Negras occurring during the Terminal Preclassic. Sometime late in the Late Preclassic or, more likely, during the Terminal Preclassic, some or all of these structures in the vicinity of the South Group Court were razed to make way for the construction of R-3-2nd, R-5-2nd, and the platforms supporting those structures. It was at this time that the midden fronting Str. R-5 was buried. In addition, much of the South Group Plaza was leveled and paved. It is also probable that a Late Preclassic or Terminal Preclassic structure was built at the location occupied by the Late Classic remains of Str. R-8. Excavations with Strs. R-9 and R-10, two pyramidal buildings defining the eastern edge of the South Group Court, failed to recover evidence of Late Preclassic construction activity. Excavations immediately in front of those pyramids, however, indicated that the Late Preclassic plaza extended to at least that point.[11]

This construction may correspond to the reign of the first Piedras Negras ruler. Altar 1, dated A.D. 692 (9.13.0.0.0), mentions an otherwise unknown personage ruling at Piedras Negras in A.D. 297 (8.13.0.0.0). Houston (Houston et al. 2003) suggests that this date may be a forced historical contrivance as it is precisely one baktun prior to the dedication date, and may therefore reflect a mythical, rather than historical, individual.

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[11] Tunneling of Str. O-13 also revealed evidence of Terminal Preclassic construction. Unfortunately, the loosely consolidated fill of O-13 prevented more extensive investigation of this stratum. No building contemporary with the construction at O-13 has been found elsewhere in the East Group Plaza.

However, the A.D. 297 date fits well within the time period suggested here for much of the Piedras Negras' earliest construction. It may be that this text does, in fact, refer to an actual person, and that this individual was responsible for much of the earliest public architecture at Piedras Negras.

Finally, it seems logical that the social and political changes occurring at the site as evidenced by the initial construction of public and monumental architecture would have been paralleled by a growth in population. We would expect that this growth in population would have been matched by an increase in domestic architecture, a process that should be visible archaeologically. However, despite extensive excavation in the residential areas to the west and east of the South Group Plaza, no evidence of Preclassic domestic architecture has been found. This absence is puzzling and especially difficult to understand given the wide distribution of Early Classic, Naba phase ceramics at Piedras Negras.

Founding 2 - Naba (A.D. 350-560)

Naba ceramics are found in all areas of the site, in good quantity, and in association with dated monuments. The Naba ceramic phase extends from approximately A.D. 350 to A.D. 560 and is divided into early and late facets. The initial date is established on comparative grounds with materials elsewhere, whereas the terminal date is established on absolute dates derived from carved stelae and carbon recovered from a termination deposit. Faceting is possible on the differential distribution of particular modes, many of which are directly related to Balche phase ceramic developments.

What makes this phase somewhat difficult to understand, particularly in light of both earlier and later developments, is the seemingly sudden appearance of Naba phase ceramics in all areas of Piedras Negras. Though it is possible to facet Naba into early and later periods, we are able to do this only with relatively few contexts, and so we are left with an apparent explosion in population and ceramic diversity with little understanding of the developmental trajectory describing either Preclassic to Early Classic ceramic change or Preclassic to Early Classic changes in population and settlement patterns. From our perspective, population and settlement patterns simply change, and change very rapidly, from one state to another with no clear transition between stages.

Unmixed deposits of Naba phase ceramics are found in a total of 33 locations across the site core, including the residential complexes located at the northern end of the site (C- and F- groups) and in the residential groups located outside the site core (Amy Kovak, personal communication 2003). Early Classic ceramics are also found within the fill or in association with much of the monumental architecture in the southern sector of the site, in the deepest levels of excavation beneath the East Group Plaza near Strs. O-12 and O-13, and in plaza fill near Strs. S-17, S-18, and S-19. Some of these locations produced unmixed deposits of early facet Naba ceramics, indicating that construction began in these locations sometime prior to about A.D. 500.

Early Classic ceramics are also found in almost all locations below the West Group Court and in a number of locations on the Acropolis. It appears as if at least portions of the West Group Plaza may have been occupied during early facet Naba. Ceramics dating to this period have been found just above bedrock immediately in front of Str. N-1 and in a few locations within a platform covered by the West Group Plaza surface. In the area excavated near Str. N-1, the ceramics were found embedded in a sticky black matrix reminiscent of the matrix encountered in the Preclassic midden found in the South Group Court, suggesting that one of first the residences outside the South Group Court was founded in this area.

The arrangement, style, and scale of the architecture buried beneath the West Group Court indicates that this area may have served as a palace or elite residential complex during the Early Classic (Garrido 1999, 2000). Though the deposits below the West Group Court are generally shallow, the stratigraphy of particular excavations, especially those in the southwestern section of the court near Str. N-1 (Child and Child 2000b; Garrido 1999) indicates that the initial leveling and filling of this area may have begun early in the Naba phase and likely continued throughout that phase. Fill found immediately in front of Str. R-5 at the northeastern end of the West Group Court (Escobedo 1998) dates the earliest construction to Late Naba or Balche. Unfortunately, the ceramic samples from the Early Classic architecture buried beneath the West Group Court Plaza floor are of insufficient size and variety to determine whether an Early or Late Naba placement is most appropriate. However, stratigraphic and historical data indicate that a Late Naba placement is likely.

Early Classic ceramics were also found buried beneath the Acropolis, a Late Classic collection of elite residences, temples, and sweat baths dominating the highest point in the city. In most cases, the Early Classic ceramics from the Acropolis were found on bedrock and were unmixed with later materials. These ceramics are associated with the earliest phases of construction, but in most cases, the samples are neither large enough nor well-preserved enough to determine whether they are early or late facet Naba. There are a few exceptions, however, to this general pattern.

One of the largest and best-preserved Early Classic assemblages from Piedras Negras was recovered from a termination deposit found on Court Three of the Acropolis, beneath Str. J-11-1st and covering the façade of an earlier structure, J-11 sub-1. (Golden 1998, 1999). This deposit was large, consisting of over 100 partially reconstructible polychrome and monochrome serving vessels as well as a large number of unslipped storage and cooking jars. In addition to the numerous vessels, a large number of figurines, jade beads and unusual ceramic earspools were also recovered from the termination. This deposit was buried beneath a thick layer of burned clay and subsequently covered by the construction of the overlying structure J-20-1st. The burned clay covering the termination provided several samples of charcoal, one of which was subject to AMS dating (AA 41370) and provided a calibrated date of A.D. 560.

Elsewhere on the Acropolis, a few other small but well preserved deposits of Naba phase ceramics date to the Late Facet, suggesting that construction on the Acropolis probably began in earnest sometime after about A.D. 500. It is not clear exactly what this construction represents - a few households taking advantage of the area's elevation and easy access to the river, or the earliest iterations of an elite residential complex. However, given the Early Classic history of the site, it seems likely that the Late Naba architecture of the Acropolis represents the beginning of the site's Late Classic Palace.

Lintel 49 at Yaxchilán makes reference to a ruler at Piedras Negras who reigned sometime around A.D. 460 (Martin and Grube 2000:119).[12] Unfortunately, there are no contemporary monuments at Piedras Negras, and it is, as a result, impossible to tie ceramics manufactured during his reign to an absolute date or, more importantly, to link the construction of some of Piedras Negras' oldest structures to his reign. Despite this, it seems likely that Ruler A presided over the city during a time of unprecedented growth and was responsible for commissioning many of the monumental structures dominating the site's southern sector that were built during the first half of the Naba ceramic phase.

Working from Late Classic analogs drawn from elsewhere in the Peten, Golden (2002) has convincingly argued that the disruption in political life at Piedras Negras resulting from the capture of Ruler A may have led to reorganization of the site's political center, resulting in the gradual abandonment of the site's southern sector as a focus of royal activity and an increased emphasis on the central area of the site as the seat of political power. This process led to the destruction of the Early Classic palace buried beneath the West Group Court and initiation of the Acropolis as the center of royal life. Ceramic data from around Str. K-5 and from elsewhere in the West Group Court indicates that the process of transforming this section of the site from an elite residential complex to a public space suitable for royal spectacles began at the very end of the Early Classic.

Stelae 11 records a period no earlier than about A.D. 560 when Piedras Negras paid tribute to Pomona. The enormous amounts of bajareque (burned wattle and daub)

[12] Inscriptions at Yaxchilan refer to nobles with some connection to Piedras Negras prior to this time. Yaxchilan Stela 11 mentions the capture of an individual with some connection to Piedras Negras between about A.D. 359 and A.D 378 (Martin and Grube 2000:118-119), indicating that Piedras Negras was already a nascent power along the Usumacinta, a possibility that accords well with the ceramic chronology.

recovered from the West Group Court excavations suggest that the Early Classic palace constructed here may have been violently burned. In the same manner that the West Group Court was selected as a site of royal activity following the capture of Ruler A, the Piedras Negras elite may have attempted a similar re-creation of history and place following defeat by forces from Pomona. It is important to note that the architectural changes occurring at this time were accompanied by changes in the iconographic programs of monumental art, changes in political organization across the Usumacinta Basin, and changes in the ceramics of Piedras Negras. The changes in material culture occurring at this time (A.D. 560-750) are the focus of this dissertation and will be covered in greater detail in the following chapter.

Collapse - Late Chacalhaaz and Kumche (A.D. 810-900)

The final monument at Yaxchilán, Lintel 10, describes the capture of Piedras Negras Ruler 7 by K'inich Tatb'u Skull III in A.D. 808 (Stuart 1998). At Piedras Negras, this capture appears to have resulted in the destruction of a number of buildings on the Acropolis including Str. J-12, and also Throne 1 (Figure 4.21). Following this defeat, Piedras Negras as a city and as a political entity began to disintegrate. By A.D. 850, the population was a fraction of what it had been just 40 years before and construction had nearly ceased. In fact, it appears that some buildings, such as Str. 0-17, may have been abandoned in the process of construction or renovation (Fitzsimmons 2000). By A.D. 900, the city appears to have been abandoned completely. The only evidence for continued occupation or visitation are a number of "Lacandon" type censers and a pair of plates cached in the rubble of Str. P-7 (refer to Figures 4.1, 4.2, 4.20) (Child and Child 2001a).

Figure 4.21 Smashed fragments of Throne One scattered in front of Str. J-1. (Photograph Courtesy of the University Museum, University of Pennsylvania)

Ceramics that likely post-date the A.D. 808 destruction of the Acropolis define the Late Chacalhaaz period. Late Chacalhaaz ceramics are identifiable by a number of changes in vessel form and decorative motif, including a simplification of painted designs, a notable increase in the size of serving vessels, and the disappearance of Chablekal Fine Gray ceramics. Kumche was initially identified by the appearance of Tres Naciones Fine Orange and Altar Fine Orange ceramics, though more extensive analysis has allowed us to identify Kumche deposits in the absence of fine paste ceramics. Notable changes in Kumche assemblages include a reduction in serving vessel size, increasingly fine carbonate tempers, and a reduction in painted and decorated ceramic types.

The A.D. 808 defeat of Piedras Negras followed a 15-year hiatus in monument erection. The final monument at Piedras Negras, Stela 12, erected by Ruler 7 in A.D. 795 (9.18.5.0.0), records the defeat of Pomona by Piedras Negras and the capture of several nobles from that site.[13] Stela 12 depicts Ruler 7 presiding over a host of captives flanked by vassals from La Mar, a small site approximately 16 km southwest of Piedras Negras. Artistically, Stela 12 represents the pinnacle of the sculptor's art, and iconographically, it presents a portrait of a powerful Ruler 7. In addition to recording a historical moment, Stela 12 is also a period ending marker, the final one in a line extending back to the accession of Ruler 2 in A.D. 639.

Chacalhaaz ceramics are widely distributed within the site core and site periphery. From the distribution of these materials it seems clear that Piedras Negras reached its maximum population at this time, probably peaking shortly before the capture of Piedras Negras Ruler 7. The pace and scale of construction, the vitality of the art, and the clear record of Piedras Negras' political and military successes give the impression that as the ninth century closed, Piedras Negras was thriving. If the break in monument erection after A.D. 785 can be taken as an indication of a weakening state, we are left wondering why such a precipitous decline in the power of the ruler to attract a following and maintain the sociopolitical integrity of his kingdom occurred. Though we cannot answer this question conclusively, the ceramics of the site may provide a clue to the internal social processes

[13] Altar 3 records may record a date of A.D. 810, though the name of the person responsible for the dedication of this monument is unknown.

that may have contributed to the dissolution of Piedras Negras.

Late Chacalhaaz

Late Chacalhaaz ceramics are found in 16 locations across the site, including residential areas at the northern end of the site core, the Acropolis, and residential areas located within the central and southern portions of the site. In addition, a few sherds of Late Chacalhaaz ceramics were found adhering to the exterior wall of the temple topping Str. O-13, where they were possibly used as armatures for plaster sculpture. The distribution of Late Chacalhaaz ceramics at Piedras Negras suggests a major contraction in population, but it is possible that this is a result of sample bias more than fact - there is no doubt that for reasons of preservation, sample size, or mixing, a number of ceramic lots dating to this period were identified simply as Chacalhaaz, with no facet affiliation (Early or Late) possible. For this reason, it is possible that the amount of Late Chacalhaaz ceramics is under-represented in this count. In addition it is possible that other structures, particularly those on the Acropolis, may have contained substantial amounts of Late Chacalhaaz ceramics that were excavated by the University Museum Project. In his notes, Frank Cresson recorded a large amount of trash spilling out of Str. J-2 and onto the adjacent plaza floor. It seems possible that an analogous situation may have been found in other structures on the Acropolis or elsewhere at that site. This problem makes interpretation difficult, though it is certain that Late Chacalhaaz represents the final vigorous occupation of the site.

Ten of the 16 identified Late Chacalhaaz deposits represent thin surface scatters, while six represent more substantial deposits located in construction fill (2), middens (3), and a possible termination deposit (1). The presence of identifiable Late Chacalhaaz ceramics in construction fill on the Acropolis, in residential groups within the site core, in the plaster covering the façade of the temple topping Str. O-13, and in various locations across the site indicate that Piedras Negras, though reduced in population, was still a thriving site after the capture of Ruler 7. The middens and termination deposits at or near the surface indicate that these ceramics likely represented the final occupation of those groups in which they were located and can be taken as indicative of the terminal activities at those groups. The following discussion focuses on the midden and termination deposits and trends evident in the serving dishes' size from these deposits.

A large deposit of Late Chacalhaaz ceramics and other kinds of domestic trash was found filling the central portion of Str. C-10 (Jackson 2001). This deposit contained the normal array of domestic trash including lithic manufacturing debris, animal bone, and large quantities of ceramics. A second Late Chacalhaaz midden was found in an alley separating Strs. J-25 and J-33 (Golden et al. 2000; Golden and Quiroa 2001). Like the midden found in Str. C-10, this midden contained the normal array of domestic debris, including an exhausted metate. A third Late Chacalhaaz midden was found within Str. J-17, a monumental sweat bath located along the northern margin of the Acropolis. Excavations in 1999 (Child and Child 2000a) indicated that several rooms of this structure had been filled with ceramic debris, a large percentage of which consisted of polychrome serving vessels. In addition to the ceramics, this deposit also contained the same array of domestic trash (faunal remains, lithic, debris, and so forth) found in the other middens. It is possible that this midden represents a termination similar to that found in Str. C-12 (see below).

However, the variety and quantity of faunal remains found within J-17, as well as the general context, suggest a different origin for this deposit.

Str. C-12 was a two room building, the rear room of which was filled with large quantities of Late Chacalhaaz ceramics and then sealed. Beneath this material, several intact censers and one polychrome drum were found resting directly on the floor. Though there is little evidence for burning, the placement and orientation of the censers suggested that they were probably in use as the structure was filled. In addition to the large number of smashed vessels, a single Hutzijan Orange Polychrome serving dish was also found here. The vessel was found badly fractured, but complete and laying face down on the floor of this structure (Jackson 2001). Finally, a large amount of animal bone was also found in this deposit. Species represented included white tail and brocket deer, peccary, river turtle, and various kinds of fish. Given the context, the large number of serving vessels and animal bone, it seems likely that this room was ritually terminated and then filled with the trash derived from the feast accompanying this event.[14]

The middens and the termination deposit provide ceramic data valuable for understanding the social processes leading to the collapse and dissolution of Piedras Negras. Examining these four deposits, we see that they have several things in common, the most important of which is the preponderance of large serving vessels. Looking at a single class of serving vessel, Hutzijan Polychrome dishes, we find that of the 249 sherds

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[14] Hutzijan Polychrome dishes are identifiable by their specific forms and the painted motif decorating their exteriors - a seated spider monkey, a single arm outstretched and grasping either chile or tamale (though in one example the chile or tamale is replaced by a what may be a conch shell). Interestingly, Karl Taube (personal communication 2000, see also Taube 1989) states that spider monkeys are typically associated with drinking and feasting.

of Hutzijan Polychrome sherds found by the BYU/Del Valle Project, 233 came from these contexts.[15] These sherds are not simply the remains of serving vessels; they are the remains of dishes used in feasts, which is suggested not only by their large size, but also by their limited distribution. Second, three of the four deposits are found occupying the interiors of structures rather than in areas outside of the building that would have been the normal place for dumping trash. In the case of the C-10 deposit, it seems clear that the building was purposefully terminated. The purposeful filling of rooms with trash is not simply an act of destruction, it is also an act of abandonment, whether the building is ritually terminated as at Str. C-10, or filled with everyday debris as Strs. J-17 and C-12 were. That these deposits were found in association with the final episodes of occupation and not incorporated into later building fill as is typical elsewhere suggests that the site was gradually being abandoned and that once-important structures, such as Sweat bath J-17, were no longer important aspects of the city's ritual, religious, or ceremonial life.

Finally, it is important to note that these structures were likely not terminated or filled with trash by squatters who were simply filling the rooms of unoccupied buildings with refuse. Rather the quality of the material found within these structures suggests that the individuals responsible for creating these deposits were of an elevated social class. For example, several objects with hieroglyphic inscriptions were recovered from the C-12 deposit, including a bone awl with an incised ownership statement. Though no

[15] Thirteen of the remaining 16 sherds were found scattered across the surface of Operation 33f, a residential group at the southern sector of the site. The remaining sherds were found in Operations 2, 36, and 37 respectively. An additional 55 sherds were recovered by the University Museum Project (Holley 1983:504). Though most of these appear to have been found on the Acropolis, the context of these sherds is not clear.

hieroglyphic materials were found in the deposit located in Acropolis Str. J-17, the overall quality of the ceramics found in this deposit — including several elaborately decorated polychrome vessels — suggests that the individuals creating this deposit were of elevated status.

The Hutzijan Polychrome vessels have no clear analogs in the earlier ceramic record of the site. Furthermore, the fact that they are found only in specific contexts suggests that they may have had a specific function - perhaps related to the elaborate presentation of foodstuffs at feasts or other festival events. Festival events, particularly when they are accompanied by the presentation of large gifts of food, often function to create relations of debt and to create or reinforce systems of patronage and obligation.

The political situation at Piedras Negras following the death of Ruler 7 bears certain structural similarity to the events affecting the site at the end of the Early Classic and the death of Ruler A. That Piedras Negras was able to successfully recover from the upheavals of the sixth century leads one to ask why was Piedras Negras not able to recover from similar events at the beginning of the ninth century — why was the interruption in dynastic continuity so devastating at this time? If the Hutzijan vessels can be taken as indicators of specialized activities — and their limited distribution suggests that this may be the case — then the distribution of these vessels and the activities implied by their presence suggest something about the political and social climate at Piedras Negras after about A.D. 810. The distribution of the large serving vessels suggests a period of political fragmentation and competition following the dissolution of central authority. The ruler of Piedras Negras, as moral authority (Houston et al. 2003), suppressed factional competition and promoted political stability. Once restraints on political competition were removed, the site began to fragment as factions competed with one another for political ascendancy. The systems that had acted to maintain stability and dynasty at Piedras Negras for over 200 years failed, and the site began to disintegrate.

Kumche (A.D. 850 - 900)

Kumche assemblages are identifiable by the presence of Altar group Fine Orange ceramics. The majority of Kumche materials at Piedras Negras have been found in the southern sector of the site, either scattered across the surface of Late Classic buildings or associated with the remains of a putative Terminal Classic structure. The presence of a Terminal Classic, possibly colonnaded, building in the Southern sector of the site suggests a continuation of the processes suggested by the distribution of Hutzijan polychrome - the creation of small elite factions within the site core. However, it is unlikely that there was a substantial population at Piedras Negras. It is more likely that the Kumche occupation represented a few households scattered across the southern and central sectors of the site and the Acropolis. The picture is of a few small households set among the decaying ruins of a dying city. As the Classic period drew to a close even those residences were abandoned and the site left to the jungle. Because all the Kumche materials at Piedras Negras are found on the surface, it is impossible to place a terminal date on this period. We do know, however, that by approximately A.D. 950, structures at Piedras Negras had already begun to collapse and the site had become an abandoned center visited only by the occasional pilgrim.

CONCLUSION

The major thesis of this dissertation is that many of the ceramic changes evident at Piedras Negras during the Late Classic were tied to social and political changes occurring in and around the site. This issue bears on a number of topics, including the development of regional ceramic styles in the Late Classic Maya Lowlands and, more generally, on the processes of technological change and elaboration. At Piedras Negras, the increase in serving vessel size, particularly the marked increase during the Late Chacalhaaz, may be tied to the dissolution of central authority. This occurred first as the result of an expanding elite sector, a process observed at other Late Classic Maya sites, and second as a result of increasing competition between households or factions within Piedras Negras.

The changes in the Chacalhaaz ceramic assemblage presented above in the description of the collapse and abandonment of the site serve as an example of the changes that are the principal focus of this dissertation - the development and elaboration of resist decoration, a process occurring between about A.D. 550 and A.D. 680. Though the example presented in this chapter is later in time and at a lesser scale than the earlier changes in decorative technology, it is similar in that the changing social environment of Piedras Negras was the motivating force behind these changes. The following chapters examine this process in detail, focusing on the development of resist decorated ceramics. This development is first framed as a result of the sociopolitical changes occurring at Piedras Negras beginning in the late sixth century A.D. (Chapter 5), and second as a result of more general processes linking crafting and the possession of cultural goods to political legitimation.

Chapter 5

THE HISTORICAL CONTEXT OF CERAMIC CHANGE AT PIEDRAS NEGRAS, GUATEMALA A.D. 550-750

> Epochs of revolutionary crises…anxiously conjure up the spirits of the past to their service and borrow from them names, battle slogans, and costumes in order to present the new scene in worlds history in this time honored guise and borrowed language. Marx, 1eighth Brumaire

The previous chapter presented a phase-by-phase description of the Piedras Negras ceramics. The dominant modes and types for each phase were described, a general description of the spatial distribution of ceramics by phase was given, and some of the implications of that data for understanding the history of the site were presented. Most of this discussion focused on the implications of the ceramic data for understanding the initial settlement (600 B.C. - A.D. 550) and abandonment of Piedras Negras (A.D. 750-900). This chapter reviews the historical events of this period and their potential impact on the material culture of Piedras Negras.

The period A.D. 550-750 encompasses the late Naba, Balche and Yaxche (Tzakol 3, Tepeu 1 and early Tepeu 2) ceramic phases at Piedras Negras. At Piedras Negras and across the Maya Lowlands, this was a period of major transformation and was marked by the disruption and reorganization of political structure at numerous Lowland sites. This period saw the establishment of Piedras Negras as a political power in the Usumacinta Basin and the stabilization of the dynasty that would head the polity for the next 200 years. Materially, the major changes in a wide variety of material culture, including monumental art, architecture, and ceramics testify to the scale of the political and social shifts occurring at this time. In fact, it is during this period that the ceramics of Piedras Negras undergo their most regular and profound series of changes, a process culminating in the creation of a distinct ceramic style emphasizing resist and resist-reserve decoration. This style appears to be unique or very nearly so to Piedras Negras and the immediate surroundings and appears to have no clear analogs elsewhere in the Maya Lowlands.[16]

The ceramic changes occurring at Piedras Negras between A.D. 550 and 750 and the development of a unique, regional ceramic style did not occur in a historical or social vacuum, nor were they the inevitable outcome of stochastic processes of experimentation and innovation. Rather, the ceramic changes at Piedras Negras were a result of the historical and sociopolitical forces affecting Piedras Negras and other Lowland Maya sites at this time and they cannot be reasonably considered apart from those other changes in material culture. The reason for this lies in the nature of these changes and their potential significance. The changes in the monumental art and architecture at Piedras Negras appear to be conscious efforts at crafting new sociopolitical identities built on Teotihuacán's historic presence in the Maya area. At a lesser scale, resist decoration may also have developed as a means for establishing elite identity and in response to Piedras Negras' reconfigured political landscape. For this reason, it is necessary to situate the ceramic changes occurring at Piedras Negras within a larger historical and material context. This includes both historical events affecting all of the Southern Maya Lowlands and events specific to the Usumacinta Basin and Piedras Negras.

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[16] Some resist decorated ceramics similar to those found at Piedras Negras are known from Altar de Sacrificios (Adams 1971) and La Joyanca (Melanie Forné, personal communication 2003). However, the quantities of these materials are limited, and it seems likely that Piedras Negras is the ultimate origin for pottery style.

The first section of this chapter describes the historical context of the Maya Lowlands and Piedras Negras between about A.D. 500 and 650. This period is chosen on the basis of changes visible in the ceramics of Piedras Negras - it is during this time that the shifts in decorative technology that will come to dominate the ceramic assemblage of the site first become obvious. This period encompasses a break in the inscriptions of Piedras Negras that signals some site-wide political trauma and including the time known across the Maya Lowlands as the Hiatus.

Following this section are reviews of the changes in the monumental art and architecture of Piedras Negras. The point here is as profound as the changes in the ceramics of Piedras Negras seem, they were part of a much larger shift in material culture. These changes must be seen as part of a single, though not necessarily unitary, strategy for creating, maintaining, and, ultimately, contesting social and political identities as the elite and commoners of Piedras Negras tried to cope with the new social and political circumstances affecting the Maya Lowlands. At the most visible scales, these attempts to create new identities were manifested through the creation of new monumental and architectural programs signaling a new political order. On a lesser scale the creation of a new ceramic style may have served initially as a marker of elite identity and later became a means for celebrating and challenging those identities as it was replicated at succeedingly lesser social scales.

THE HIATUS, THE MAYA LOWLANDS, AND PIEDRAS NEGRAS

Tatiana Proskouriakoff (1950) first noted a "hiatus" in monument erection between approximately A.D. 534 and A.D. 593. Though we now know that a pan-Lowland break in monument erection did not occur (Culbert 1991; Sharer 1999, 2003a, 2003b; see also Martin and Grube 2000) and that other sites, like Caracol (Martin and Grube 2000:89-93) flourished during this period, a disruption in the dynastic record does appear to have occurred at a number of different sites.[17] At many sites (e.g., Altar de Sacrificios [Willey 1973:68], Tikal [Jones 1991], Copan [Sharer 2003b, Sharer et al. 1999]) monuments dating to the "hiatus" have been found defaced and re-used as building material in later constructions, indicating a major interruption in the political life of these sites (Muñoz and Golden 2005; Golden 2002). Golden (2002) has convincingly argued that this was not a period of "passive transformation" (Golden 2002:350; see also Willey 1974) marking the transition from the Early to Late Classic. Rather, he argues that this was a period of active change during which material culture was manipulated to efface past political convulsions and re-established authority.

There is no single event that can be identified as the cause of the political turmoil affecting the Maya Lowlands at this time. In the central, Peten the disruption of the dynastic record and the political life of many sites was almost certainly related to the political maneuverings of Calakmul and Tikal (Martin and Grube 1995a,1995b, 2000). More generally, however, these disruptions may have been due to the changing relationship between Teotihuacán and the Maya Lowlands (Fash and Fash 2000; Pazstory

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[17] There are numerous examples at other points in the history of the Maya Lowlands where breaks in monument erection can be tied directly to catastrophic defeats by rival sites. The beginning of a 118-year break in monument erection (A.D. 680-798) at Caracol is coincident with the defeat of that site by forces from Naranjo. At Naranjo, military defeats occasioned two breaks in monument erection, the first between A.D. 626 and 682 and a second between A.D. 744 and 780.

1978; Stuart 2000; Willey 1974, 1985).[18] The direct effects of this were felt most strongly in the central Peten, but had implications for sites across the Maya Lowlands.

Teotihuacán and the Maya Lowlands

From a historical perspective there can be little doubt that Teotihuacán played a major role in shaping the political fortunes of Tikal and Copan. Both Tikal and Copan have rich epigraphic records detailing the putative arrival of personages from Teotihuacán who worked to usurp local dynasties and establish a long lasting foreign presence in their stead. [19] The "arrival of strangers" (Martin and Grube 2000; Proskouriakoff 1993:4-10; Stuart 2000) at Tikal in A.D. 378 marked the death of Tikal ruler Chak Tok Ich'aak I and the installation of a new dynasty headed by the probable descendents of Spear Thrower Owl, a likely emissary from Central Mexico.[20,21]

The origins of the dynasty heading Copan throughout the Late Classic parallels, to a

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18 Willey (1974) tied the decline of Central Peten polities to the withdrawal of Teotihuacán from the Lowlands, citing the collapse of trade connections as one of the principal causes of the Hiatus. While trade connections certainly existed between the two regions, they are unlikely to have been of such magnitude that their demise would have caused the Central Peten polities to collapse.

19 There is some disagreement regarding the role of Teotihuacános in Lowland Maya politics. It seems unlikely that an army of Teotihuacános would have been able to swarm out of the Basin of Mexico and conquer the Maya Lowlands. Mesoamerican states simply did not have the technological prowess, logistical capability, or organizational complexity to make this possible. It seems more likely that the dynastic changes at Tikal and Copan may have been "inside jobs" executed by local factions working in concert with resident Teotihuacános.

20 This history is recorded on monuments at Tikal, Uaxactun, and El Peru and has received extensive study from a number of scholars, including Schele and Mathews (1991), Proskouriakoff (1993), Martin and Grube (2000), and Stuart (2000). Stuart provides (2000:487) provides a succinct timeline of the events surrounding the installation of the new Tikal dynasty at this time. Martin and Grube (2000:30-32) elaborate on the events time and offer some competing interpretations. Fash and Fash (2000:446-447) further interprets these events in light of the archaeological and epigraphic data from Copan. Finally, various chapters in Braswell (2003) (see especially chapters by Ponce de Leon [2003], and Laporte [2003]) offer some interpretation of the material culture changes accompanying this foreign intrusion and dynastic change.

21 Stuart (2000) suggests that Spear Thrower Owl may have been a ruler or noble of Teotihuacán who took as his wife "Lady K'inich" ostensibly a royal woman of Tikal. The offspring of this marriage, Yax Nuun Ayiin, was the first of five rulers who could trace their legitimacy to this union.

surprising degree, the founding of the dynasty that controlled Tikal between A.D. 378 and 562. This similarity extends to the point where some of the same individuals described at Tikal are described at Copan. K'inich Yax K'uk' Mo, the founder of the Copan dynasty, is said to have arrived at that site in A.D. 426. An inscription at Copan (Stuart 2000, 2003:244-246) indicates his arrival was somehow connected to Siyaj K'ahk' (literally "Fire is Born," also known as "Smoking Frog") (Fash and Fash 2000:446; Sharer 2003a).[22] Siyaj K'ahk' is well known at Tikal, where his arrival preceded Spear Thrower Owl's and coincided with the death of Tikal ruler Chak Tok Ich'aak I in A.D. 379.[23]

At sites other than Tikal and Copan the evidence for contact between the Central Mexican Highlands and the Maya area is equivocal. Pyrite mirror backs, green obsidian, and Thin Orange ceramics are often interpreted as the most direct indicators of contact with Central Mexico. Most of these materials, however, are found in limited quantities or in ritual contexts, suggesting they were never a common trade items (Clark 1986; Demarest and Foias 1993; Moholy-Nagy 1979; Moholy-Nagy et al. 1984). Cylinder tripods and talud-tablero architecture are also considered as less direct, but no less meaningful, indicators of contact with the Teotihuacán. The cylinder tripod, however, is now believed to have originated in Veracruz (Laporte and Fialko 1987; Rattray 1977,

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[22] A sculpture at Tikal bears a text detailing events occurring in A.D. 403 and A.D. 406 that involve Tikal ruler Yax Nuun Ayiin and a lord named K'uk' Mo (Quetzal Macaw). The similarity between this name and the name of the Copan ruler seems more than a coincidence - skeletal evidence (Buikstra et al. 2003) indicates that the founder of the Copan dynasty was most likely from the Central Peten.

[23] It is not clear what role the enigmatic Siyaj K'ahk' had in the political changes at Tikal or Copan, but his presence was clearly a critical aspect of the new political order installed at those sites. In addition to Tikal and Copan, he is mentioned in the inscriptions of Bejucal, Rio Azul, El Peru and Palenque. Sharer (in Golden 2002:386) believes that the Siyaj K'ahk' described at Copan may not be the same Siyaj K'ahk' mentioned at Tikal.

2001) while talud-tablero architecture has such a wide chronological and spatial distribution that its utility as a marker of Central Mexican influence is questionable (Giddens 1995; Laporte 1995, 2003).[24]

The lack of material evidence for direct contact between Teotihuacán and most Maya sites, however, should not be taken as a measure of the influence of that site on the Lowlands. It is clear from the wide distribution of Teotihuacán and Central Mexican iconography, particularly martial iconography, that Central Mexico played an important ideological role in the Late Classic Maya area. Interestingly, it is only after Teotihuacán begins to collapse and its interaction with the Maya Lowlands to decline that the use of Teotihuacán iconography in the Maya area reaches its zenith. While it is ultimately impossible to say how the dissolution of Teotihuacán's political power affected individual Maya sites, it did have far-reaching consequences, and it is these consequences that form the historical frame for the events surrounding the changes in material culture at Piedras Negras.

Tikal, the Decline of Teotihuacán, and the Maya Lowlands

Teotihuacán was in full decline by A.D. 600, and the gradual processes leading to the dissolution of this capital may have induced a general contraction of its sphere of

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[24] A few sites such as Becan (Ball 1977) and Altun Ha (Pendergast1 1971, 2003) have produced evidence of contact with Teotihuacán, The nature of this evidence, however, suggests very short-term contact, perhaps relegated to a single episode in the site's history. While there may have been more substantial contact between these sites, this contact left no material traces and had little effect on the political or social lives of these sites, at least not in a way that is manifest archaeologically. The point here is that this provides us with a model for understanding the effects of Teotihuacán on most of the Maya Lowlands - much more subtle than the kinds of direct interference in local events seen at Tikal or, less certainly, at Copan. It is these subtle effects that are the focus of this chapter.

influence beginning somewhat earlier (Cowgill 1996:328-329, 1997:156; Smyth and Rogart 2004:43; Wolfman 1990). It is possible that by the mid-fifth century, the political support necessary for the maintenance of the Tikal dynasty provided by Teotihuacán was no longer available.[25] The earliest indications of Teotihuacán's waning influence may have been the troubles afflicting Tikal, beginning with the death of Tikal ruler Chak Tok Ich'aak II in A.D. 508.

Although the monumental record of Chak Tok Ich'aak II's at Tikal is limited, but there is nothing in his inscriptions to indicate political weakness. However, the fact that his death was recorded at Tonina rather than Tikal suggests that he was a prisoner there and was sacrificed following his capture in war or that he had been forced to flee to Tonina following some political crises at home.[26] Only 13 days after Chak Tok Ich'aak II's death, one of his vassals was captured by Yaxchilán (Martin and Grube 2000:120). That neither Yaxchilán nor Tonina were sites of significant size points to Tikal's vulnerability at this time.

This suspicion is bolstered by the fact that Chak Tok Ich'aak II's son, Wak Chan

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[25] I do not mean to imply that Teotihuacán exercised direct control over Tikal - this would entail a level of logistical and military organization that Mesoamerican polities were simply not capable of supporting (Cowgill 1997; Webster 2000). Insofar as the 6th century defeat of Tikal can be indicative of larger socio-cultural and historical processes, we might be tempted to see it as a sign of the collapse of the Teotihuacán empire. Empire, in this sense, does not refer to a large, integrated territorial unit along the lines of states (e.g., Roman or Incan) that relied on standing armies and a clearly defined provincial hierarchy. Rather Teotihuacán exercised a more subtle ideological influence that was neither entirely military nor economic.

[26] It is possible that the mention of Chak Tok Ich'aak II's death at Tonina is nothing more than a contextualization of a local death. Stephen Houston (personal communication, 2005) notes that that same monument at Tonina also mentions the death of other foreign nobles including one from Calakmul. However, the scenario presented has historical analogs in the Maya Lowlands includings parallels in Tikal's Late Classic history. Tikal ruler Nuun Ujol Chaak is known to have fled to Palenque to escape possible capture by Calakmul or a vassal of that site some time around A.D. 659.

K’awil, did not accede to the Tikal throne in A.D. 537. During this nearly 30-year interregnum, Tikal was ruled by a series of rulers of which very little is known. Chak Tok Ich’aak II was followed by Lady of Tikal, who acceded to the throne in A.D. 511 at age 6 and ruled until A.D. 527. Only a few female rulers are known from Maya history, and they seem to have served as a sort of last resort, ruling only when there were no male heirs (Hewitt 1999). Her presence speaks to the magnitude of the disruptions suffered by the dynasty of Tikal at this time.

The Tikal dynasty was restored in A.D. 537 with the accession of Wak Chan K’awil. We know very little about Wak Chan K’awil prior to his accession, though his only surviving monument, Tikal Stela 17, commissioned in A.D. 537, celebrates the 20-year anniversary of his “arrival” at Tikal (Martin and Grube 2000:38-39). This event was likely the return of a one-time exile, a possibility heightening the sense of dynastic intrigue and instability marking this period. It is important to note that Wak Chan K’awil made explicit reference to his dynasty’s Central Mexican origins on a plate commemorating the 9.6.0.0.0 (A.D. 554) period ending. This plate, decorated with a Teotihuacán owl, was a graphic attempt to bolster Wak Chan K’awil’s claim to the throne and the legitimacy of his dynasty. Tikal’s renewal would not be long-lived. In A.D. 562, Wak Chan K’awil was captured and sacrificed following a defeat by rival Calakmul.

Tikal, Calakmul, and the Maya Lowlands

However close the relationship between the Tikal and Teotihuacán, it is unlikely that the dissolution of the Teotihuacán was alone sufficient to render Tikal vulnerable. Moholy-Nagy (2003b) has pointed out that the hiatus at Tikal was likely the result of internal political developments rather than conquest from outside. This position is certainly tenable, especially given the state of affairs at Tikal following the death of Chak Tok Ich'aak II. However, while internal political problems almost certainly contributed to political instability at Tikal leading up to the events of A.D. 562, these troubles were likely exacerbated by the dissolution of Teotihuacán. This is suggested by the fact that as dire as the dynastic situation at Tikal appeared following the death of Chak Tok Ich'aak II, it was not serious enough to result in a political reorganization. While the decline of Teotihuacán may have undermined the Tikal dynasty, it also provided sites elsewhere in the Lowlands an opportunity to expand their sphere of influence.

Chief among these sites was Tikal's rival, Calakmul. Inscriptions at the sites of Dzibanche and El Resbalon, both in Quintana Roo, indicate that Calakmul was an important regional power by the early sixth century (Martin and Grube 2000:103-104).[27] By the mid-sixth century, Calakmul's influence was being felt further abroad. Naranjo Stela 25 indicates that the third ruler of the site, Aj Wosal, acceded under the auspices of Calakmul ruler Tuun K'ab' Hix in A.D. 546.[28] Piedras Negras Lintel 12 portrays the Early Classic Ruler Turtle Tooth performing a scattering ritual in the company of a possible emissary from Calakmul (Martin and Grube 2000:140-141) in A.D. 518.[29] By A.D. 599 Calakmul's reach may have extended as far as Palenque, where the Calakmul

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[27] These are the only inscriptions documenting Calakmul's Early Classic political reach. Monuments dating to this period from Calakmul are known, but their texts are difficult to decipher.

[28] A few years later, in A.D. 561, Calakmul ruler Sky Witness supervised the accession of a ruler at Los Alacranes, a small site in the modern state of Campeche.

[29] Both the Yaxchilan and Piedras Negras events likely took place during the reign of Tuun K'ab' Hix. Martin and Grube (2000:141) point out that it may be Tuun K'ab' Hix that is depicted on Piedras Negras Lintel 12.

ruler Sky Raiser is described as the protagonist of an attack on that site (Martin and Grube 2000:159-160).[30] Calakmul's history during this time, however, is not one of uninterrupted expansion. An inscription at Yaxchilán describes the A.D. 537 capture of a Calakmul vassal.

The gradual expansion of the Calakmul political sphere in conjunction with the gradual collapse of Teotihuacán steadily undermined Tikal's potency. This erosion of political power culminated with a conflict that pitted Caracol, an apparent vassal of Calakmul, against Tikal. Caracol ruler Yajaw Te' K'inich II acceded in A.D. 553 under the supervision of Tikal ruler Wak Chan K'awil. The presence, or at the very least, the sponsorship, of the Tikal ruler at the accession clearly indicates that Caracol was a client of Early Classic Tikal. Three years later, in A.D. 556, Tikal executed a Caracol lord in a *ch'ak* or axe event. This signaled the end of peaceful relations between the two sites. In A.D. 562 Caracol, with the support of Calakmul, launched a successful "Star War" event against Tikal. This resulted in the capture and probable sacrifice of the Tikal ruler Wak Chan K'awil, the installation of a new ruler at Tikal, and the beginning of an apparent 125-year hiatus in monument erection.[31]

It is clear that the dynasty of Tikal suffered a major blow at this time - Tikal succeeding rulers, the twenty-third and twenty-fourth in line, are not known by name, nor

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[30] This event likely happened after Sky Raiser died, and so it is not clear whether this is historical contrivance or an attack led by a non-ruling namesake (Martin and Grube 2000:104).

[31] It is important to note that the hostilities between Calakmul and Tikal continued into the eighth century and had lasting effects in the Peten exceeding the scope of this chapter - the continued warring between Naranjo, Yaxha, and Caracol all undertaken with the backing of Tikal and Calakmul shaped the political landscape of the central Peten for several decades. It is clear that the founding of the Dos Pilas dynasty and the eventual Petexbatun hegemony enjoyed by the Dos Pilas dynasty were a result of the conflict between Tikal and Calakmul and Calakmul's support of the Dos Pilas.

is anything known of their reign. Tikal's twenty-fifth ruler, Nun Ujol Chaak, is known primarily from inscriptions found outside Tikal, and it appears that his reign was marked by repeated clashes with Calakmul and its vassal, Dos Pilas. It is not until the accession of Jasaw Chan K'awil, in A.D. 682, that Tikal rebounded.[32]

It is difficult to assess the impact of these events on the Lowlands as a whole, though it seems that the extensive influence exercised by these sites assured that the declining and ascending fortunes of Tikal and Calakmul, respectively, would impact a large part of the Lowlands and provide an opportunity for extensive political maneuvering. To a far greater degree than other sites, Tikal and Calakmul exercised "overkingship" over a host of lesser sites (Martin and Grube 2000). Inscriptions documenting the presence of Calakmul nobles are known from sites across the Lowlands, some of which are located hundreds of kilometers away. In contrast, the majority of Tikal contacts seem to be with sites less than 85 km distant (Martin and Grube 2000). Tikal ruler Nuun Ujol Chaak is described as arriving at Palenque in A.D. 659.[33] The mention of this event at Palenque as well as the presence of the Tikal emblem glyph on Copan Stela A (dedicated A.D. 731) suggest that Tikal's Early Classic political ties may have been

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[32] The absence of monuments at Tikal may result from the fact that the rulers of Tikal, as vassals of Calakmul, were prevented from erecting stelae. Though secondary sites elsewhere in the Maya Lowlands often erected their own monuments, the special relationship between Calakmul and Tikal may have made the suppression of local hieratic activity a political necessity. Second, it is possible that monuments erected during this period were destroyed following the re-installation of the Tikal dynasty after the defeat of Calakmul in A.D. 695. This possibility finds a close analog in the destruction of monuments following the accession of the Teotihuacán-backed dynasty at Tikal in A.D. 379.

[33] Further evidence on the nature of the relationship between Tikal and Palenque is the fact that Palenque was twice attacked by forces acting at the behest of the ruler of Calakmul, the first time in A.D. 599, and then again in A.D. 611. The fact the Calakmul would expend the effort to attack such a distant site and the fact that the ruler of Tikal would flee there suggest a close political relationship between Tikal and Palenque not otherwise hinted at in the inscriptions.

extensive (Barthel 1968; Martin and Grube 1995, 2000:42).

Given the epigraphically attested distribution of Calakmul's political influence, it is easy to imagine that site as heading a large and expansive state surrounding an isolated Tikal. Such a view does not accord well with our understanding of Maya history, however. Maya polities are better described as "chain-like networks" (Martin and Grube 1995:7) rather than as expansive spheres radiating out from a single central site. Ties between sites were established through personal linkages or coercion and maintained for political expediency. The emphasis on personal relationships and coercion in the creation of these "chain-like networks" virtually assured that the political fortunes of individual rulers were dependent on the fortunes of the larger center to which they were tied. The result was a fragile political system easily disordered by relatively slight perturbations in patterns of patronage. It is the dynamics of this system that allowed the expansion and stabilization of the Piedras Negras polity following the events of the sixth century.

Material Impacts, A.D. 550-750

The withdrawal of Teotihuacán from the Maya Lowlands, the catastrophic events at Tikal, and the expanding power of Calakmul are inseparable events that together form the historical context in which the material and political changes at Piedras Negras occurred. Piedras Negras was not alone in experiencing political crises. The concurrent changes affecting sites across the Maya Lowlands were profound and widespread. To different extents, sites including Altar de Sacrificios (Willey 1973), Yaxuna (Ambrosino et al. 2001), Tikal (Harrison 1999:14: Jones 1991), and Copan (Sharer et al. 1999) all experienced significant architectural changes and breaks in constructional sequences at this time. Golden (2002) has convincingly argued that this was a period experienced emically by the ancient Maya as one of political and social disjunction, with the changes occurring at this time manifesting archaeologically as the break between the Early and Late Classic.

At most sites, including Piedras Negras, the break between the Early and Late Classic found expression most obviously in changing programs of monumental art and architecture. Though we cannot describe exactly the desires held by the rulers of Piedras Negras when instituting these changes, it seems likely that they were part of an intentional strategy to obscure past political trauma and create a new basis for legitimacy. This was accomplished by creating a new sense not only of history, as Golden (2002) has argued, but also by creating a new sense of place and identity that was intimately tied to the new political order.

The Hiatus at Piedras Negras, A.D. 539-608

Though the changes in art and architecture affecting Piedras Negras at this time must be considered in light of events specific to the site and to the Usumacinta Basin, the timing and expression of these changes, including the dissolution of Teotihuacán and the escalating conflict between Tikal and Calakmul, suggest that they were related to the political traumas affecting sites across the Maya Lowlands. Though we cannot describe the precise intersection of these events, we can observe something of their outcome as they were manifested in the changing art, architecture, and ceramics of Piedras Negras.

Despite the volume of Early Classic construction, only three Early Classic monuments have been found at Piedras Negras. The earliest of these monuments, Lintel

12, was found broken and reused in the construction fill of Late Classic Str. O-13. The remaining two monuments, Stela 29 and Stela 30 were found near Strs. R-3 and R-4, respectively.[34] Panel 12 appears to have been commissioned by Early Classic Ruler C at about A.D. 518 (Martin and Grube 2000). Stelae 30 and 29 are dated to 9.5.0.0.0 (A.D. 534) and 9.5.5.0.0 (A.D. 539), respectively, and cannot be attributed to any known ruler from the dynastic sequence. After the erection of Stela 29 in A.D. 539, there is a break in the sequence of known monuments lasting nearly 70 years. This break was terminated by the erection of Stela 25 in A.D. 608.

It is unlikely that this gap represents a true break in monument erection, with no new monuments commissioned until after the accession of K'inich Yo'nal Ahk in A.D. 603. Rather, it seems more likely that that this break is due to the intentional destruction of Early Classic monuments. This is suggested by the discovery of Panel 12 (dedicated c. A.D. 518) in the construction fill of Str. O-13. A similar pattern of monument destruction and disposal is known from other sites in the Maya Lowlands.

The period between A.D. 539 and A.D. 608 frames a number of architectural events at Piedras Negras. On the Acropolis terminations dating to this period have been found in Courts 1, 2, and 3 (Golden 1998,1999, 2002; Houston and Arredondo 1999:255-256, 2000a, 2000b).[35] These terminations are roughly coincident with the razing of the Early

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[34] The context of Stela 30 is unclear. Morley (1938, plates 120a, 120b) states that fragments of Stela 30 were found reused in a drain in 1921. Whether he means a pre-Columbian drain, or something constructed by the loggers working in the area is not clear. If the former is the case, the context suggests that it was intentionally destroyed and reused in construction, in much the same way as Lintel 12.

[35] The termination in Court Three of the Acropolis was determined to be a termination very early in excavation. The Terminations in Courts 1 and 2 were more difficult to understand and were only recognized as terminations after excavations were complete.

Classic palace (Garrido 1998, 1999, 2000, Houston et al. 1999), the expansion of the West Group Court (Escobedo 1997), and the initial construction of pyramidal Str. K-5 (Escobedo 1997; Holley 1983:235, Table 6; Houston et al. 2000, 2003; Muñoz et al. 2006).[36] Taken together, the interruption in monument erection, the destruction of Early Classic monuments, the destruction of the Early Classic Palace, and the architectural changes evident across the site indicate that Piedras Negras suffered a major political shock sometime early in the sixth century, one from which it did not recover for several decades. The erection of K'inich Yo'nal Ahk's accession monument in A.D. 608 marked the end of this period at Piedras Negras and initiated a 200-year period of unprecedented growth and political stability. The events leading up to this break are integral to understanding the social and political conditions at Piedras Negras as it emerged from the sixth century and the changes in material culture that took place at the site at the beginning of the seventh century.

Piedras Negras at the end of the Early Classic

Martin and Grube (2000) attribute the paucity of Early Classic monuments at Piedras Negras to a possible "sixth century defeat and despoiling" (Martin and Grube 2000:141). Unfortunately the surviving Early Classic texts from Piedras Negras and elsewhere in the region do little to illuminate this period in Piedras Negras history. However, the archaeological record of the period and the texts of Late Classic

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[36] Furthermore, the presence of Late Naba Ceramics in the fill and surrounding matrix of the buried West Group Palace indicate that this area was razed no later than about A.D. 550 (Golden 2002, Muñoz and Golden 2004). The filling and leveling of this area seemed to have taken some time, but was almost certainly finished by about A.D. 630.

monuments Stela 12 and Panel 2, dated A.D. 795 and A.D. 667, respectively, suggest that there may be some truth to Martin and Grube's assertion.

Piedras Negras Panel 2 (dedicated A.D. 667) shows the Early Classic ruler Turtle Tooth presiding over a number of captives, including Knot Eye Jaguar I, the ruler of Yaxchilán in 510 A.D.. Panel 2 is compositionally similar to Lintel 12, dedicated in A.D. 518. This Early Classic monument also depicts an Early Classic ruler of Piedras Negras, Ruler C (A.D. 514-518), presiding over captives, including another unfortunate from Yaxchilán. It seems clear from these inscriptions, and from the apparent boom in construction that Piedras Negras was a dominant political force at the beginning of the sixth century. This situation would not last long, however.

The text of Stela 12 is concerned primarily with two eighth century victories of Piedras Negras' allies over Pomona. In addition to this, this stela also bears a retrospective reference to a time no later than about A.D. 554 when the ruler of Piedras Negras paid tribute to the ruler of Pomona (Houston et al. 2000). It is likely that this retrospective reference refers to a sixth century defeat of Piedras Negras by the forces acting at the behest of the ruler of Pomona sometime not long after the dedication of Piedras Negras Stela 29 in A.D. 539.

The effects of this defeat must have been devastating. The epigraphic record of Piedras Negras contains no reference to the name of the ruler heading the site at this time. The existence of a ruler is suggested only by the presence of Stelae 29 and 30, which date to this time and must have been the result of royal sanction. Unfortunately, however, the names of their patrons are obliterated. The paucity of monuments dating to this time period and the absence of any later references to the noble heading Piedras Negras at this time were likely the result of intentional efforts on the part of later Piedras Negras rulers to obscure past political trauma through the intentional destruction of monuments and by extension history. This is strongly suggested by the fact that Lintel 12, an Early Classic monument depicting Piedras Negras Ruler C presiding over a series of captives, was found broken and reused in the construction fill of Str. O-13. Like the intentional destruction and burial of Early Classic monuments at Uaxactun and Tikal and the Late Classic destruction and defacing of monuments at sites elsewhere in the Peten, this points to some major trauma leading to political reorganization.

The break in the dynastic sequence is not the only evidence for a sociopolitical fracture at Piedras Negras. There are also significant differences in the titles held by the rulers of Piedras Negras before and after this interruption. Piedras Negras Panels 2 and 12 refer to both Rulers B and C as the vassals of another Maya lord, Tajoom Uk'ab' Tuun (Martin and Grube 2000:141). It is important to note that the title born by this lord, *Och K'in Kaloomte*' (literally "West Lord") is a title typically associated with political legitimacy deriving from Central Mexico (Martin and Grube 2000:141; Stuart 2000:493-494). Panel 2 records Tajoom Uk'ab' Tuun presenting Piedras Negras Ruler C with a *ko'haw*, a "plated helmet of Mexican design" (Martin and Grube 2000:141) in A.D. 510. A foreign lord with the same title presided over a scattering ritual performed by Ruler C in A.D. 514. Though the ruler is not named, the fact that he bears the same title suggests that the same individual was involved in both events. In both cases the Piedras Negras rulers are titled *yajaw* (literally, "lord of") indicating subordination to the foreign noble.

After the accession of Ruler 1 in A.D. 603, there is no indication that the rulers of Piedras Negras ever acknowledged subordination to another sovereign and, in fact, after this time, they emphasize their control over subordinate nobility. The Late Classic rulers of Piedras Negras do, however, continue to emphasize their connections to foreign sources of legitimacy. Though never acknowledging subordination, the Piedras Negras Late Classic continued to appropriate Central Mexican symbolism, particularly when depicted in warrior regalia (Stone 1989).[37]

Changing Iconographic Programs in the Piedras Negras Monuments, A.D. 550-750

While it is impossible to say precisely how the withdrawal of Teotihuacán from the Maya Lowlands affected Piedras Negras, it seems clear that the Late Classic rulers of Piedras Negras were dependent on that site for some degree of political legitimation. Teotihuacáno imagery is most clearly recognized in the Late Classic "warrior stelae" from Piedras Negras. Four warrior stelae are known from Piedras Negras (St. 26, 35, 8, and 9). The earliest stela bearing the Teotihuacán war imagery is Stela 26, erected by Ruler 1, in A.D. 628. Rulers 2, 3, and 4 erected their own warrior stela in A.D. 662, 721, and 736, respectively. These stelae typically depict the ruler in a full frontal pose wearing costumes laden with Teotihuacánoid iconography and clutching fringed, square shields. Shields of the same design are found in the Tikal monuments most closely associated with the arrival and heirs of Siyah K'ak and Spear-Thrower Owl, both of whom are closely associated with Teotihuacán (Martin and Grube 2000; Stuart 2000, 2003

[37] It is tempting to suggest that there was a change in the Piedras Negras dynasty occurring at this time. Unfortunately no evidence exists to either prove or disprove this possibility, though the continued use of the "Turtle" epithet by Late Classic rulers suggests dynastic continuity.

Proskouriakoff 1993). In addition, individuals identifiable as captives by their pose and state of dress frame the rulers. The content of these stelae is similar to that of Panel 2.

Panel 2 (dedicated A.D. 667) portrays the Early Classic ruler, Turtle Tooth, presiding over a host of subordinate lords from Lacanha, Bomapak, and Yaxchilán. The subordinate lords kneel before the ruler, who is depicted in Teotihuacán garb and holding a square, fringed shield. Though the format of this monument differs significantly from the Warrior Stelae, the iconographic message is the same - a powerful lord stressing foreign legitimacy and martial prowess presides over a host of miserable captives. It is important to note that Panel 2, although depicting an Early Classic event, was carved during the Late Classic. The use of Teotihuacán iconography on the shield may therefore be more the result of Late Classic artistic conventions than a matter of historical record. The depiction of Turtle Tooth on Panel 2 and on Late Classic stelae can be contrasted with the depiction of Early Classic Ruler C on Lintel 12.

Lintel 12 (dedicated A.D. 514) is compositionally similar to Panel 2 - a warrior king presiding over four captive lords from sites elsewhere along the Ususmacinta, including Knot-eye Jaguar of Yaxchilán, a lord of the Wa-Bird site, and two others from unidentified locales. Importantly, this monument dates to the Early Classic, and the events depicted very likely took place only a short time before the monument was commissioned. What is most notable about this monument is that Ruler C is shown *without* the accoutrements typical of later warrior stelae - missing are the fringed shield, the War Serpent Headdress, and the other iconographic references to Teotihuacán found in later monuments. This emphasis on foreign-derived legitimacy and the overt presentation of costumes elements indexical of foreign origins developed at Piedras Negras only after A.D. 600, and only after Piedras Negras emerged as the preeminent political power in the upper Usumacinta Basin.

Disconnection in the Monumental Art of Piedras Negras

In contrasting the Piedras Negras warrior and "niche" stelae, Stone (1989) has argued that these stelae exemplify royal strategies of "disconnection" and "connection," respectively. In the case of the former, strategies of disconnection may be used as a justification for a dynastic line that "defines itself in terms of palpably different qualities not seen in the general population" (Stone 1989:153). Strategies of disconnection emphasized rulers' status as "stranger kings...ontologically and historically separate from their subjects" (Houston and Stuart 1996:289). This difference was made more dramatic when the ruler donned costumes of divine or otherwise non-Maya figures. Costuming was more than mere theatre - it allowed the ruler an opportunity to become a physical manifestation of the thing represented (Houston 2001; Houston and Stuart 1996:298). As such, rulers were allowed to engage in behaviors contradictory to the restrained state normally held as the ideal for elite comportment (Houston 2001).

In contrast, strategies of connection emphasize the ruler's moral authority and role as a paragon of societal virtues. In the case of the niche stela, Piedras Negras rulers are depicted in a seated position surrounded by an iconographic program reiterating the ruler's position as the community's center and moral ideal (Houston et al 2003; Inomata 2001a, 2001b). The strategies of connection and disconnection employed by Maya rulers may also have had a second, more subtle, function - to point out the differences between a ruler's sacred and secular roles, between his role as an ajaw, or holy lord, and his role as a political leader involved in the day-to-day business of managing court and kingdom. The result of the strategies, whether consciously deployed or not, was to create a new identity for the ruler's separating them from the pedestrian and linking them to a mythologized and heroic past.

Changing Architectural Programs at Piedras Negras A.D. 550-750

Though this section is concerned with the large-scale architectural changes taking place at Piedras Negras after about A.D. 550, the focus of this chapter is the period A.D. 550 - A.D. 630. This period is coeval with the Balche ceramic phase, encompasses nearly all of Ruler 1's reign, and is roughly coterminous with his death in A.D. 639. In considering the architectural changes taking place during this period, there are three areas of the site meriting attention - the Acropolis, the West Group Court, and the South Group Court and South Group Plaza. The principal point that I wish to make is that the architectural changes occurring at Piedras Negras were not the result of the ruler's caprice, or the stochastic growth of the site's royal precinct. Rather, they were programmatic statements intended to promote a particular ideology, creating a new sense of place and identity.

In the same way that the flexible iconographic content of stelae allowed rulers to alter their composition to convey different information, changes in architecture are motivated as much by social, political, and religious needs as they are by aesthetics (Borowicz 2003; Nagao 1989). The architectural changes taking place at Piedras Negras at this time are nowhere more visible than on the Acropolis. The Acropolis appears to have undergone almost continual building and renovation between approximately A.D. 450 and 810. Between approximately A.D. 550 and 600, however, it appears that nearly every structure of the Early Classic Acropolis was destroyed and buried. Following this episode, many areas of the Acropolis were not renovated for some time, perhaps for decades (Golden 2002; Muñoz and Golden 2005).

The cause of this destruction is unclear. At least on building on the Acropolis, Str. J-11, appears to have been ritually terminated. Excavations indicate that masses of pottery, clay figurines, and jade artifacts were smashed against the buildings' façade. The building then razed, and the remains buried while still smoldering. Elsewhere on the Acropolis, a number of other structures were destroyed and buried at this time. Excavations in Courts 1 and 2 indicated that all of the Early Classic buildings had been demolished, and many buried and capped by a layer of dark clay similar to the one found covering J-11. However, neither the rich association of artifacts nor the signs of burning found in the J-11 termination were encountered in any of these cases. Following the destruction of the Early Classic buildings, construction on the Acropolis was limited to a few low platforms in Courts 3 and 4.

Following several decades of inactivity, construction resumed on the Acropolis. The architecture of the Acropolis as it developed during the seventh century was dramatically different from its sixth century form. Patios were more formal and access more restricted and the sheer size of the Late Classic Acropolis is indicative of an ongoing construction effort dwarfing, that which came before (Golden 1998, 1999, 2002; Golden and Houston

1999; Houston et al. 1998, 2000, 2003). In Court Three changes were most evident in the arrangement of buildings into a formal courtyard. During the Early Classic the structures of Court Three had been arranged with regard to the natural features of the landscape. Beginning in about A.D. 630, the natural features of the landscape were buried under an enormous quantity of fill, and a formal court referencing neither the landscape nor the prior architectural arrangements was constructed. Much of the Late Classic form of the Acropolis was due to work undertaken during the reign of Ruler 2 (A.D. 639-686).

The West Group Court suffered architectural disruptions very similar to those seen on the Acropolis. The West Group Court is a broad patio bounded by the Acropolis, Str. K-5, and Str.N-1, a sweat bath. Str.s N-1 and K-5 are roughly aligned and are positioned to have possibly been the terminal points of a processional route that would have taken participants from the sweat bath, across the West Group Court, through the Ballcourt, and eventually to Str. K-5. The remains of an Early Classic palace are buried beneath the Late Classic plaza. Excavations revealed a spacious arrangement of masonry platforms that once supported perishable superstructures. The arrangement of these platforms is reminiscent of the Acropolis and suggests that this area was once the focus of Early Classic royal life.

Excavations indicate that construction began here sometime in the Early Naba ceramic phase (c.a. A.D. 450) (Acuña 2004; Muñoz et al. 2006). Sometime around A.D. 550, or roughly coeval with the events on the Acropolis, the entire area appears to have been razed, and the façades of many of the platforms were partially destroyed. The conspicuous absence of Balche phase ceramics in the matrix surrounding the buried platforms and the presence of some Yaxche phase (A.D. 630-750) ceramics indicate that the area was left fallow for a number of years following its destruction. Most likely this palace was destroyed in a single brief episode sometime around A.D. 550 - roughly contemporary with the architectural destructions seen on the Acropolis. Following this period, there are almost no signs of efforts aimed at reconstructing this area. In fact, the absence of Balche phase ceramics and the mixing of Naba and Yaxche phase material suggest that the razed remains of the Early Classic palace may have sat open and undisturbed for decades before construction efforts resumed.

The causes of the destruction seen in the West Group Court and Acropolis are not entirely clear. Some of this destruction may have resulted from the conflict with Pomona referenced on Stela 12. Though there are no direct epigraphic references to this event, the text of Stela 12 makes it clear that Piedras Negras was subordinate to Pomona for an unspecified period of time prior to about A.D. 554. It is possible that forces acting at the behest of the Pomona ruler reached Piedras Negras and leveled parts of the palace as they moved across the city. The inhabitants of Piedras Negras subsequently destroyed the remaining structures in to eliminate the detritus of war. As similar explanation may also hold for some of the destroyed buildings of the Early Classic Acropolis.

Despite the fact that construction was held to a minimum on the Acropolis and West Group Court, monumental construction did continue elsewhere. Much of this work took place at the north end of the West Group Court, beyond the limits of the Early Classic Palace. During the Balche ceramic phase, this area was leveled and filled, and Str. K-5-1st was constructed (Holley 1983; Escobedo 1998; Houston et al. 2000, 2003; Muñoz et al.

2006). Because much of this period falls within the inscriptional hiatus at Piedras Negras, it is difficult to attribute this building program to any identifiable ruler. It may have been the work of Ruler 1 (A.D. 608-639) or to his unknown predecessor. Of these two possibilities, the latter seems more likely as it appears that Ruler 1 focused his energies on the South Group Court, in effect abandoning those areas that had been the focus of prior political life and concentrating on those areas that were more closely tied to Piedras Negras' past as a preeminent political power.[38]

The South Group Court of Piedras Negras was the first area of the site to be settled and was the focus of the earliest monumental architecture. Of the six pyramids located in this sector of the site, at least four contain cores of Preclassic architecture and almost all have some evidence of Early Classic modification. The only two Early Classic stelae known from Piedras Negras, Stela 30 (dedicated A.D. 534) and Stela 29 (dedicated A.D. 539), were found here, near Strs. R-3 and R-4 respectively. The quantity of monumental architecture in combination with the presence of stelae, indicate that this was the civic-ceremonial core of the Early Classic city. It is in this sector of the site that Ruler 1 chose to commemorate his rule and erect his major monuments, Stelae 25, 26, and 31.

Stelae 25 and 26 were found in front of Str. R-9, and Stela 31 was found between Strs. R-4 and R-5. Stela 25 commemorates Ruler 1's accession to the Piedras Negras throne in

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[38] It is also possible that Ruler 1 began work in the South Group late in his reign, preparing the area for the resumption of hieratic and political activities. A third explanation may be that Ruler 1 began work in the South Group Court at the same time that he was initiating projects in the West Group Court. In the absence of dated monuments or a finer ceramic chronology, it is very difficult to choose between competing hypotheses. One may be tempted to date the West Group Court construction to the late Naba ceramic or early Balche ceramic periods, explaining the mixture of modes as the result of a transition. However, it is possible that the Early Classic materials in these lots were taken from the fill of the demolished Early Classic structures immediately to the south of K-5.

A.D. 608, while Stela 26 and 31 commemorate victories over Palenque and Sak T'zi, respectively. Together, these three monuments record Ruler 1's emergence as one of the dominant political figures of the Usumacinta Basin. Panel 4 records Ruler 1's death in A.D. 639. Panel 4, a monument commissioned by Ruler 1's heir, was found within the temple of Str. R-5 and strongly indicates that this structure houses Ruler 2's burial, though excavations have so far failed to locate his grave (Escobedo and Zamora 1999, 2000a, 2000b; Houston et al. 2000:100; Martin and Grube 2000:142-143; Morley 1938).

Excavations in the 1930s (Holley 1983:85-86) and in the 1990s (Child and Child 2001c; Escobedo and Zamora 1999, 2000b; Muñoz et al. 2000,2006) recovered Balche phase ceramics from the fill of Strs. R-2, R-5, and R-8 as well as from numerous other structures in the South Group Court. Given the distribution of Balche phase ceramics, it appears that the South Group Court and vicinity was subject to more construction than any other sector of the site, though all sectors experienced some constructional activity at this time.

Ruler 2 (A.D. 639-686 A.D.) continued the pattern established by his father, focusing on the South Group more intently than on any other sector of the site. Six of Ruler 2's Stelae were placed in front of Str. R-5, a structure otherwise associated with the reign of Ruler 2's father. In addition, it appears clear that Ruler 2 carried out some modifications of Strs. R-5 and R-9, and constructed monumental sweat bath R-13. Ceramics diagnostic of early facet Yaxche (A.D. 630-680) were recovered from unmixed fill in all of these structures. In addition, early facet Yaxche ceramics were also recovered from several residential groups in the southern sector of the site as well as from a residential groups southeast of the West Group Court.

Ruler 2's construction efforts were distributed more widely than his predecessors and included the Acropolis and the West Group Plaza. In the West Group Court, the remains of the Early Classic Palace appear to have been buried and Str. K-5 completed. K-5 appears to have been renovated at least three times during Ruler 2's reign and was the site of monument dedications. Ruler 2 erected two stelae, Stelae 38 and 39, on the basal platform supporting this structure. The texts of these stelae are eroded, but they appear to mark quarter katun endings in A.D. 682 and 687 respectively. Panel Seven was found by the University Museum excavators at the summit of Str. K-5. Although damaged, this panel appears to describe Ruler 2 receiving tribute from lords from the site of Hix Witz and mentions a woman from this polity who may have been his bride.

On the Acropolis, early facet Yaxche ceramics are known from a number of contexts and suggest that the Acropolis was again becoming the focus of royal life. Panel 15, discovered in 2000 at the base of Pyramid J-4, presents a retrospective history of Ruler 2's life and was commissioned on the twentieth anniversary of his death (Houston and Arredondo 2000b; Houston et al. 2000a). The location in which this panel was found strongly suggests that Ruler 2 is buried within Str. J-4. By the death of Ruler 2 in A.D. 686, the switch in emphasis from the Southern to the Northern sectors of the site was complete.

Several features of the Late Classic Acropolis point to the strategies employed by the Late Classic rulers in creating political identities that were divorced from the Early Classic regime. It has been noted that beginning with Ruler 1, much of the monumental art of Piedras Negras, particularly the warrior stelae, employed a great deal of Teotihuacáno imagery. Hruby (2005) has noted that the façade of pyramid Str. J-4 was decorated with a trapezoidal motif found at the sites of Acanceh in the Yucatan and Copan. These trapezoidal architectural elements are very similar to Teotihuacáno depictions of mountains, prompting the identification of J-4 as a model or evocation of a place in Central Mexico or more generally, as a location somehow outside of Piedras Negras.[39]

The identification of the Acropolis as a foreign locale was heightened by the presence of Mexican year sign elements decorating the façade of Str. K-3 (Fitzsimmons 2001; Fitzsimmons et al. 2003). This structure is strategically placed along the edge of staircase K-2, the principal access to the West Group Plaza and the Acropolis. Such an obvious display of foreign insignia would have signaled immediately to supplicants or emissaries that they were entering a world apart from that represented by the rest of the ancient city. Excavations indicated the initial construction of this building, like the façade of Str. J-4, was likely undertaken during the reign of Ruler 2 (Fitzsimmons 2001).

The epigraphic history of the Usumacinta Basin suggests that Piedras Negras was the major regional power at this time. The architectural changes, particularly the rebirth of the Acropolis and West Group Court as the focus of royal life, coincided with Piedras Negras' return to political preeminence. There is some indication, however, that Piedras Negras was not a sovereign power. A panel from an unknown subsidiary of Piedras Negras describes Ruler 2 receiving a *ko'haw* helmet and a pelt from a foreign overseer carrying the title *aj b'aak* ("He of Captives") and said to be a vassal of Yuknoom the Great, ruler of

[39] Stuart (2000:198) makes a similar argument for Copan. He writes that the "ascent to the summit [of Str. 10L-6] would involve not only a journey to a previous era, but to a place cloaked in the imagery of Highland Mexico."

Calakmul (Martin and Grube 2000). Ruler II was thus not immune to the larger political currents affecting the Lowlands. There is some indication that the Yaxchilán dynasty may have been a cadet lineage of the Tikal ruling line. The political crises at Tikal following its defeat by Caracol in A.D. 562 may have engendered a loss of legitimacy affecting Tikal's satellites. If this is the case, it may have allowed Piedras Negras, as a vassal of Calakmul, to expand into the vacuum created by a weakened Yaxchilán dynasty.

The deployment of Teotihuacáno imagery on the Late Classic architecture of Piedras Negras coincides with the sites' rise to political prominence and with the use of foreign iconography on the monuments at the site. In both cases, the intent of the iconography was the same - to highlight the ontological differences existing between rulers and subjects; a difference extending not just to the person of the ruler, but to the entire court conceived of both as the social setting in which the ruler resided as well as the stone and mortar construction of the royal palace. While the shifting architectural foci signaled a break with a discredited regime and an effort to create a new sense of history (Golden 2002), the deployment of Teotihuacáno imagery may have signaled an effort on the part of the Piedras Negras rulers to create a novel identity, one rooted in a past that was as much imagined as experienced.

Monumentality, Place, and Identity

Given the prominence of Teotihuacán iconography in the art and architecture of Piedras Negras, we must why ask why that site provided such a fund of ideas from which the rulers of Piedras Negras could draw. There is no doubt that the Maya were aware of Teotihuacán and familiar with its preeminent role in the Basin of Mexico. Maya-style ceramics and art found in the Tetitla compound and elsewhere at Teotihuacán (Linne 1934, 1942; Rattray 1989, 1990; Smith 1987; Taube 2003; Villagra 1954) indicate that Maya were very likely present at Teotihuacán. Furthermore, legible hieroglyphic texts in the Tetitla compound suggest that the Maya presence at Teotihuacán was primarily an elite one (Taube 2003). The presence of Maya at Teotihuacán suggests a mechanism whereby the Maya could have gained a detailed knowledge of Teotihuacán ritual and religious practice, transported that information back to the Maya core, and diffused in one form or another throughout the ranks of the elite.[40]

Elite exposure to Teotihuacán art and ritual, however, is not a reason for the adoption of Teotihuacáno imagery, though it may account for the facility with which that imagery was deployed in Maya art.[41] Cowgill (2003:330-331) suggests that Teotihuacáno imagery was adopted in the Maya Lowlands to appropriate the gods and rituals associated with Teotihuacán's success in warfare. This decision was based on the Maya's knowledge of Teotihuacán's military prowess in Central Mexico, their awareness of Teotihuacán's successful incursions into the Central Peten, and the accelerating pace and scale of Late Classic warfare. This argument resonates with Schele and Friedel's (1990)

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[40] The presence of Maya or Maya-style artifacts at Teotihuacán, and of Teotihuacán or Central Mexican artifacts at major Lowland Maya sites are a reflection of processes common across Mesoamerica, Brainerd (1954:23), commenting on the tombs and material culture of Kaminaljuyu, noted that a "cosmopolitan exchange of goods and ideas" was probably a common characteristic of Mesoamerican elites. Landa notes that during the fifteenth century revolt at Mayapan all of the royal sons were slain excepting one who was on a trading mission to Honduras (Taube 2004:312, citing Tozzer 1941:39).

[41] Teotihuacáno imagery used in the Maya area does not appear as disparate elements set into a matrix of Maya iconography. Rather, Teotihuacán imagery is used in appropriate context and in proper combination with other Teotihuacán and Maya iconographic elements. This suggests that the artists responsible for either creating or directing the creation of the artistic programs found on the monuments were well versed in both Teotihuacáno and Maya iconography. It is difficult to imagine where the Maya could have come about this knowledge without direct interaction in religious rituals or formal training. (see Marcus 2004; Demarest and Foias 1993; Sharer 1983:254; Fash and Fash 2000).

proposal that new, more violent military tactics, introduced into the Maya area by Teotihuacános, replaced practices that had been up to that time limited to contests between a few competing elites for the purposes of taking captives.[42]

While there is evidence that the pace and scale of warfare was increasing throughout the Maya Lowlands during the Late Classic (Child 1999; Webster 2000: 93-101), there is also archaeological evidence that warfare was relatively common during the Late Preclassic and Early Classic and that it occurred at a scale comparable to Late Classic conflicts (Ambrosino 2001; Friedel et al. 1989; Webster 2003:99-112, 1999, 1976). In the Western Lowlands, the epigraphic records of both Piedras Negras and Yaxchilán indicate that these two sites were antagonists by at least as early as the fifth century A.D. (Martin and Grube 2000:140-141) and possibly even as early as the mid-fourth century (Martin and Grube 2000:119). Given this, it seems unlikely that the arrival of Teotihuacános had an immediate effect on the practice of Maya warfare or the use of Teotihuacáno imagery in Late Classic art. In any case, this seems only a partial explanation for a very complex phenomenon - one made especially intractable by the fact that the martial iconography common to Teotihuacán and the Maya is simply one highly visible aspect of a larger corpus of shared concepts (Aveni 2000; Taube 1998, 2000, 2003).

Laporte and Fialko (1995, see also Laporte 2003) point out that Teotihuacáno

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[42] Though placed in a synchronic framework, Schele and Friedel's idea of the ancient Maya engaging in warfare primarily for the purposes of taking sacrificial victims is not far removed from much earlier visions of Maya warfare. Exactly such a vision is described in Thompson (1954:81) who wrote that, "I think that one can assume fairly constant friction over boundaries sometime leading to a little fighting…to assure a constant supply of sacrificial captives, but I think the evidence is against the assumption of regular warfare on a considerable scale." The same sentiment is echoed by a number of researchers including Demarest (1978), Friedel (1986), Schele (1984), Schele and Freidel (1990); Schele and Miller (1986).

imagery at Tikal was preceded by at least a century by the use of Teotihuacáno architectural elements. This suggests that Tikal, as well other sites in the Maya Lowlands, may have been in intensive contact with Teotihuacán for some time prior to the widespread use of Teotihuacáno imagery. This possibility is suggested by the small amount of Late Preclassic ceramics that have been found at Teotihuacán (Smith 1987) and by the possible evidence for Teotihuacán - Maya contact found at Becan (Ball 1977) and Altun Ha (Pendergast 1971, 1979) that appears to predate any Teotihuacáno incursion into the Central Lowlands.

Demarest and Foias (1993:171) concluded that the chronological evidence from the Maya area indicates that the two cultures were in continuous contact over a long period of time, and that contact was not focused on a single process, series of historical events, or a single time period.[43] They further conclude that the display of locally made copies of Teotihuacáno ceramics, architecture, and painting may have been helpful in maintaining elite power (Demarest and Foias 1993:172). They do not, however, provide a plausible explanation for why this might be the case.

Golden (2002:392-393) has suggested that the staid and impersonal nature of Teotihuacáno art made it an ideal source for a ruling ideology suitable for a people where displays of extreme emotion were considered indicators of amoral, animalistic, or

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[43] Based on this and other evidence, Golden (2002) has suggested that the Teotihuacános mentioned at Tikal may have been invited to that site in an effort to bolster dynastic legitimacy. This possibility has ethnographic and ethnohistoric analogs elsewhere and has important implications for understanding the role Teotihuacán played in the creation and legitimation of Late Classic polities. A situation similar to that proposed by Golden can be found in Post Classic Mexico, where the Mexica of newly founded Tenochtitlan asked the ruler of neighboring Culhuacan to send them a ruler. Though the geographic distance was not great, the ontological and social differences separating the two cultures was.

supernatural status (Houston 2001). While possible, it seems more likely that it was simply Teotihuacán's status as a distant and largely mythological location that made it an ideal source for a legitimating ideology. Even though Teotihuacáno and Maya beliefs may have "coalesced into a syncretized religious and ritual practice" (Hruby 2005.:4; see also Berlo 1984:202-215) useful for sanctioning rule, there was little inherent in the nature of Teotihuacán rulership or cosmology that made it an ideal source for a legitimating ideology. This becomes clear when one considers the very different forms of rulership exercised by paramounts at Teotihuacán and at Classic Maya sites.

While we know little of the specifics of rulership at Teotihuacán, we can make inferences as to the nature of that rule by comparing the Teotihuacán art with the royal art of the Maya Lowlands. Few monuments of any kind are known from Teotihuacán.[44] Instead, most of the known art is found painted on the interior of ostensibly residential compounds and would not have been visible to large public audiences. The mural art of Teotihuacán is notable for the absence of identifiable individuals and the common depictions of impersonal deities and mythological locations. If the murals were the focus of devotion, then that devotion was focused on the deity and the related mythology, not on the deified leader. The sense is of an ideology more dependent on collective identification with place and pantheon rather than on the moral authority or charisma of an individual. Cowgill even goes so far as to suggest that one of the key integrative mechanisms of Teotihuacáno society may have been an overriding sense of "civic pride

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[44] The known monuments of Teotihuacán include two enigmatic multi-ton monoliths. One is now located at the entrance of the National Museum in Mexico City. The other reside in front of the Pyramid of the Moon at Teotihuacán. These have been recently interpreted as a carved depiction of the goddess figure prominently displayed in Teotihuacán mural art (Headrick 2002; Pastorzy 1997).

and sense of citizenship, and not just submission to overawing deities and overpowering rulers" (Cowgill 1997:153). The same "faceless, nameless tradition" (Fash and Fash 2000:449) followed at Teotihuacán was practiced by the Toltecs of Tula, Hidalgo, and the Aztecs and speaks of a system common to Central Mexico.

In contrast to Teotihuacán, much Maya art is highly visible and focused on the individual. The most highly visible forms of Maya art - the stelae lining the plazas in front of monumental architecture - are monotonous in their depictions of rulers and courtiers engaged in ritual or ceremonial actions taking place in recognizable, named locations. In fact, it seems likely that many of the events depicted on monuments may have taken place in full view of the public, a fact further emphasizing the central importance of the ruler in Maya civic life (Inomata 2000:344). The emphasis on the individual and the highly visible location of Maya art suggests a fundamentally different conception of rulership and authority than found in Central Mexico.[45] Given this, it seems more likely that it was that it was Teotihuacán's status as a distant and largely mythological location that made it an ideal source for a legitimating ideology. This practice not only has numerous ethnographic analogs outside Mesoamerica (see Helms 1993) but is also analogous to practices within Mesoamerica, whether the exotic land is variously named Tollan, Zuyua, or Aztlan (Boone 2000; Lopez and Lopez 2000; Roys

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[45] The same themes found on monumental art are reflected in less publicly visible media such as lintels, or the murals occasionally found decorating the interior of structures. Like the monuments found elsewhere at Maya sites, lintels often depict rulers engaged in ritual or receiving tribute of prisoners or other goods. Like the more publicly visible monuments, the thematic content of lintels emphasizes the personal power and position of the ruler and his power over others. Again, the absence of comparable depictions at Teotihuacán suggests a very different kind of rule and ruler for that site when compared to the Maya Lowlands.

1933; Tedlock 1996:165-76).[46]

Stuart (2000) makes a strong case for direct intervention by Teotihuacán in the political affairs of the Maya Lowlands, suggesting that the use of Teotihuacáno imagery in Maya art has a historical basis. While this *may* be the case at Tikal and Copan, it is a difficult argument to extend to other sites, where there is little evidence for direct contact with Central Mexico. Despite the prominent contact between Piedras Negras and Teotihuacán evidenced in the monumental art, there is very little *material* evidence for direct contact between the two sites.[47] Given the absence of material markers of political and economic connection to Teotihuacán, the decision to adopt Teotihuacáno imagery at Piedras Negras must be seen, at least in part, as a political strategy to stabilize and reorient political relationships both within and without the site, and to create a new legitimating identity to efface past political trauma (Golden 2002; Muñoz and Golden 2005).

There is no doubt that Teotihuacános inserted themselves into Lowland Maya lifeand that the Classic Maya were present at that Central Mexican metropolis. With the passing of Teotihuacán, the Maya were left with an indelible memory of the place but one that mythologized and (re)imagined rather than recreated lived experience. For the Maya the past as a source of legitimating ideology was a conflation of myth and history.

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[46] The Zuyua mentioned in the Popul Vuh is a place where the Quiche forefathers acquired the staff of rule. For the Yucatec Maya, Zuyua was the source of an esoteric language consisting of a series of riddles. Taken together, these riddles formed a kind of civil service exam whose successful completion was necessary for promotion to various ritual and civic positions within the community.

[47] It is important to note that even at Maya sites with asubstantial history of contact with Teotihuacán (e.g., Copan and Tikal) there is very little direct material evidence for contact between those sites and Central Mexico (Ponce de Leon 2003; Sharer 2003a)

Dynasties or lineages with documented, historical pasts could extended without contradiction beyond memory into the imagined past, where fact merged with myth, becoming what Tedlock (1996:95) calls "mythistory". The idea of mythistory resonates with what Hobsbwam and Ranger (1983) describe as the "Invention of Tradition." For Hobsbwam, invented traditions are practices:

> …which seek to inculcate certain values and norms of behavior by repetition, which automatically implies continuity with the past…However, insofar as there is a reference to a historic past, the peculiarity of "invented" traditions is that continuity is largely facetious. In short, they are responses to novel situations which take form to reference to old situations…" [Hobsbwam 1983:1-2]

The invented traditions discussed by Hobsbwam and others evolved in the late 19th and early twentieth century as a response to the emergence of new social classes in the context of increasing industrialization and urbanization. Political legitimacy, once founded on principals of divine order, had to be refashioned to allow for democracy and social mobility. While the specific historical context in which these traditions were invented bears no resemblance to our Maya case, the more general context may - the industrial revolution in Europe represented a period of profound change during which many state institutions had to be refashioned to accommodate a changing social and political landscape. The changes occurring in the art and architecture of Piedras Negras appear to occur at just such a break in the history of the site and signal the beginning of a social and political order.

Invented traditions are not manufactured out of whole cloth. Rather they are constructed from past experience and memory, and though they are idealized and essentialized evocations of the past, they may still serve as powerful, legitimating symbols of social and moral order. In this sense, invented traditions are more than "serviceable humbuggery…fabricated with an eye politic to the present situation" (Sahlins 1999:402) and intended to stave off inevitable stasis and cultural dissolution. Traditions are not simply the result of people making their history just as they wish, selectively including or ignoring those aspects of the past they find most useful in constructing their present. Rather, invented traditions represent the active accommodation and incorporation of often disparate ideals into novel cultural representations that are intended, consciously or not, to create, maintain, and/or contest social and political identities.

In invoking the idea of invented tradition, however, we must be careful to avoid a conception of such practices as being only instruments of domination and hegemony-rather, traditions (invented or not) arise through a recursive process in which the dominated have a say in the organization of social relations; in which there is a consensus as to what constitutes a valid social contract between the governed and governors. In this sense, "traditions are invented in the specific terms of the people who invent them. When such traditions….rise to consciousness, they will be aetiologized: that is, as charter myths" (Sahlins 1999:409).

CONCLUSION

Monuments, whether building or sculpture, are more than thermodynamic excesses. They serve as spatial and temporal landmarks indexical of historic events, serving a didactic and connotative function - they are memory systems inscribed in stone that personify the "state," transmit a mythic history, provide a material connection with the past, and legitimate authority (Boyer 1994:32-35; Osborne 2001:51; see also Ashmore and Sabloff 2002; Hamann 2002; Houston and Stuart 1996; Watanabe 1992). At Piedras Negras, these myths found expression in architectural façades and monumental art that evoked an imagined past and distant place. It suggested separate origins and residences for the Piedras Negras elite, highlighting the ontological differences between ruler and subjects manifested in royal performance. Monuments, particularly stelae, depicted rulers engaged in acts whose purpose was to ensure continuity with the past into the present, either as moral beings representing idealized behaviors or as “stranger kings” whose charter was rooted in a mythical history. This association was intended, consciously or not, to create a legitimating identity for rulers, one that referenced the past, while presenting a novel view of history.

The changes in the monumental art and architecture of Piedras Negras were the result of complex local social and political processes embedded in a period of pan-Mesoamerican change following the collapse of Teotihuacán and subsequent rearrangement of Central Peten polities. Though resulting from the complex interplay of a wide variety of social and political forces, the coordinated nature of these changes suggests that they were, at least in part, the result of elite strategies intended to reorient and stabilize social and political relationships disrupted by the political traumas of the sixth and seventh centuries. The messages of order and legitimacy expressed by these monuments, however, were not singular statements imposed on a powerless population. Rather, they resulted from negotiation and modified social and political practices on both the part of the ruled and the rulers to deal with the exigencies of a reordered social and political landscape.

The timing of the changes in the monumental art and architecture at Piedras Negras were mirrored by changes in other classes of material culture, including ceramics. Beginning in about A.D. 650, the ceramics of Piedras Negras begin to undergo a series of rapid, regular and profound changes resulting in the creation of a regional ceramic style. The timing and distribution of the earliest iteration of these novel styles suggests that they were the result of a similar need for unique material expressions of elite identity that drove, on a much more dramatic scale, the changes in the monumental art and architecture visible at the site.

The following chapter reviews some of the ceramic changes occurring at Piedras Negras between A.D. 550-750, focusing on the earliest iterations of some of the novel ceramic types, including resist decoration. To a far greater degree than the monumental art and architecture, ceramics are amenable to replication and emulation. The transformation of certain ceramics types from markers of elite status to common goods suggests that ceramics may have been one of the most visible media in which the political and social negotiation between elites and non-elites played out.

Chapter 6

CERAMIC CHANGE AT PIEDRAS NEGRAS, GUATEMALA A.D. 550-750

The previous two chapters reviewed the historical and social background of the ceramic changes occurring at Piedras Negras between about A.D. 550 and A.D. 650. The political changes affecting Piedras Negras as well as the decision to utilize Teotihuacáno iconography in Late Classic art and architecture are rooted in the larger political events affecting the Maya Lowlands. The political traumas affecting Piedras Negras at the end of the sixth century as well as the concurrent interruptions in the political life at sites elsewhere in the Lowlands were most likely tied to the gradual withdrawal of Teotihuacáno influence from the Maya Lowlands as well as the increasing hostilities between Tikal and Calakmul that followed in the wake of that withdrawal.

At Piedras Negras, the most obvious reaction to the altered sociopolitical landscape was an effort on the part of the Piedras Negras elite to stabilize and legitimate political relationships through novel iconographic programs expressed in architecture and monumental art. Concurrent with the thematic shifts in monumental art and the architectural changes occurring at Piedras Negras, the ceramics underwent a series profound and regular changes. These changes culminated in the creation of a distinct tradition emphasizing the use of an elaborate true resist technique. Though resist decoration is known from a few other Maya sites, nowhere else did it develop with the same vigor - resist decoration becomes so common, in fact, that the positive painted tradition so characteristic of the Late Classic Maya never becomes as common or as elaborated as at sites elsewhere in the Lowlands.

This new decorative technology, the product of elite artisans working within a particular cultural milieu, may have initially served as a marker of elite identity and status. It quickly became, however, a tool for contesting those identities as the style was replicated at increasingly lesser social scales and was distributed more and more widely. To the degree that the invention of resist decoration was an intentional effort on the part of Piedras Negras elite, it parallels the processes that resulted in the creation of new monumental and architectural programs. These new programs not only signaled a new political order, they helped establish new political and elite identities.

These changes, particularly the decision on the part of the Piedras Negras potters to adopt and elaborate the resist technique characterizing the majority of Late Classic polychromes, was one outcome of the political and social changes affecting Piedras Negras at this time. More specifically, it is likely that the diversification of ceramic technology at Piedras Negras was one result of efforts on the part of the nobility to distinguish themselves materially from their elite counterparts both within and without the site. These efforts were expressed through the production of pottery exclusively for use by members of the royal court and through the conspicuous consumption of these wares in competitive displays intended to advance personal standing, a process with historical analogs elsewhere.

The decision to focus on resist decoration as the primary polychrome mode in the early Late Classic had a lasting affect on the developmental trajectory of the Piedras Negras ceramics, eventually resulting in the creation of a regional ceramic style. The development of resist decoration, however, is only the most elaborated example of this process - several ceramic styles identifiable with particular regions or sites developed in the Maya Lowlands during the Late Classic. These styles, however, were not the result of the elaboration of the positive painting techniques known and practiced widely, and did require the same processes of innovation and invention seen at Piedras Negras. The invention and diffusion of resist-reserve decoration across the site implies a process whereby the artistic and cultural value of ceramics produced under conditions of restricted production was downplayed in favor of the economic benefits gained by the production of a popular commodity (Kopytoff 1986).

CHAPTER SUMMARY

The first section presents a description and definition of resist and resist-reserve decoration. Unfortunately, the method employed by the ancient Maya in achieving the resist decoration is not clear. Though the techniques employed by modern potters in achieving similar results provide a reasonable analog for understanding ancient practices, the use of modern materials presents some interpretive difficulties. The ancient Maya had only organic materials available to them and used relatively unsophisticated firing techniques. In contrast, modern potters have available a wide array of masking materials and access to more sophisticated firing techniques. This makes direct application of modern techniques to the archaeological record problematic. Resist decoration was practiced by other archaeological peoples, but the exact techniques employed remain unknown. As a result, the study of the means whereby the ancient Maya decorated and fired resist vessels represents a viable avenue for future research.

The second major section of this chapter presents a discussion of the ceramic changes occurring between A.D. 560 and A.D. 750. This period encompasses the Balche and Yaxche ceramic phases - the two periods which witnessed the development and dissemination of resist decoration. By A.D. 750 and the beginning of the Chacalhaaz ceramic phase, resist decoration was declining in popularity and was being gradually replaced by positive painting as the primary polychrome technique. Included in this discussion is an overview of the distribution of resist and resist-reserve decorated ceramics in the Maya Lowlands. In general, resist and resist-reserve ceramics are widely distributed but are represented by only a few relatively rare types. This contrasts with Piedras Negras, where they are the majority types for a large part of the Late Classic.

Following this is a discussion of three major modal changes affecting the ceramics of Piedras Negras. These three modes - negative resist, the use of specular hematite, and polychrome resist - occurred in rapid succession, each replaced the other, all appeared first in elite contexts, and all achieved varying degrees of distribution across the site. This discussion is intended to familiarize the reader with the observations underlying this dissertation, and are a necessary precursor to the final section of this chapter.

This chapter closes by presenting several hypotheses regarding the relationship between the creation and dissemination of a novel ceramic style, and the ways in which ceramic production changed to meet expanding consumer demand. These hypotheses, though specific to phenomena observed at Piedras Negras, are intended as measures of processes affecting the course of ceramic change and, more generally, technological change. The hypotheses presented in this section are predicated on assumptions regarding the organization of Maya craft production at differing social scales. These assumptions are based on the ethnographic, ethnohistoric, epigraphic, and archaeological indicators of craft production, production organization, and the relationship between crafting, consumption, and identity presented in the previous chapter.

At the level of inference allowed by interpretation of archaeological data, the increasingly wide distribution of resist decorated ceramics implies an expanding consumer audience matched by concomitant changes in production organization. These differences in the organization of production can be investigated through a modal study of the resist decorated ceramics. More subtly, the changing distribution of the resist and resist-reserve ceramics suggests the successful creation of new aesthetic canons, indicating a subtle reorganization of cultural ideas regarding the definition of art and expressions of status.

CERAMIC CHANGE AT PIEDRAS NEGRAS A.D. 550-750

The period A.D. 560-750 includes the Balche and Yaxche ceramic phases. It is during this period of time that resist decorated ceramics first appear and come to dominate the polychrome assemblage of the site. A detailed description of the changes in the ceramics of Piedras Negras occurring at this time was presented in Chapter 4. The intent of the following section is to briefly review the changes in the ceramic assemblage occurring during this time, emphasizing those changes most relevant to the thesis presented here. This section begins with a discussion of resist and resist-reserve decoration. Following this is a discussion of the distribution of resist and resist-0reserve decoration in the Maya Lowlands. A review of the literature indicates that while resist and resist-reserve decoration do occur sporadically in the Maya Lowlands, at no other site do they achieve the same prominence as at Piedras Negras. This section concludes with a short description of the resist and resist-reserve types at Piedras Negras.

Techniques of Resist and Resist-Reserve Decoration

Resist and reserve are both varieties of negative decoration; that is, the design appears as light-colored areas set against a dark field. This is in contrast to positive techniques in which the design is applied in dark colors against a lighter field. Most painted polychromes in the Maya area are decorated using a positive technique. In reserve decoration or painting, the dark field is applied around the desired design using a brush or some other device that allows the careful application of color to specific areas. Before the application of the dark field, the design may be outlined using a positive technique. This outline may serve as a guide to the artist during the application of the background color or to highlight particular parts of the design. It is important to note that reserve decoration, in the sense that it is described here, is a free-hand technique. That is, it is done without the use of forms or other guides to direct the application of the background color (Rice 1987; Shepard 1956; Smith 1955; Woodbury and Trik 1953).

In contrast, resist decoration is dependent on the use of forms or temporary coatings to protect the design while the background color is applied. While the exact nature of the protective coating used on ancient Maya resist decorated pottery is not clear, most likely it was an organic material such as wax that could be easily removed by heat without distorting the underlying color. This coating was probably applied freehand, using a brush (Rice 1987; Woodbury and Trik 1953). The background color (or overslip) typically consists of a single dark slip probably applied by dipping or some other technique that would allow a very rapid and even application. At Piedras Negras, some resist decorated ceramics show evidence of having been fired at least twice. The initial firing removed the resisting material, and hardened both the cream underslip and the dark orange overslip. After this firing, clay based paints were applied to some of the resisted areas and the vessel was fired again. These paints fired to black and/or orange and highlighted areas of the design. Sonin (in Coggins 1975:46-47) reports that some elaborately decorated resist vessels may have required three or more applications of slip and possibly multiple firings. These observations are duplicated in notes left by Sonin in the Museo Nacional in Guatemala City. In these notes, Sonin describes some sherds as "RR," indicating double resist, or "RRR," indicating triple resist. This suggests multiple applications of slip, resisting material, and/or firing.

It is not clear what type of material the ancient Maya would have used to mask off portions of the vessel prior to application of the overslip. Modern era potters use a variety of materials when creating resist decorated pottery, one of the most popular being a combination of vaseline or petroleum jelly mixed with water. In general, modern potters avoid the use of resist materials such as wax or other organic materials that may burn off at a relatively low temperature. The reason for this is that when these materials burn off they may stain the surface of the vessel through the deposition of carbon. Latex, however, is also used by modern potters in the creation of resist decorated pottery. Latex is applied prior to slipping or painting and removed prior to firing so that it does not stain the vessel surface. Natural latex, derived from the Sapodilla (*Manikara zapote*), a tree common to the forests of Lowland Guatemala, is a material that would have been available to the ancient Maya, though ethnohistoric and ethnographic literature has provided little guidance on this topic.

Though the results of resist and reserve decoration appear similar, there are a number of visual clues that help distinguish between the two. On reserve decorated vessels, if the design was outlined prior to the application of the background color, then parts of the outline may be obscured if the background color was applied carelessly. In contrast, on resist decorated vessels, if the design was outlined after decoration was complete and the resisting material removed, then the outline may not follow the resisted areas exactly. In most cases, the background color on reserve-decorated vessels is applied with a brush. Because it is difficult to maintain an even application using a brush, the background may have a splotchy appearance. In contrast, because resist decorated vessels receive their final slip by dipping or some other method resulting in a very even coat, this same effect is not observed. A final clue useful for distinguishing between resist and resist-reserve decoration includes a slight blurring of the resist-applied decorations. The exact cause of this blurring is not clear, but it may result from the movement of the overslip beyond the point of application as the vessel dries or is fired.

Resist and Resist-Reserve in the Maya Area

Resist and resist-reserve are techniques utilized to one degree or another in the Maya area beginning in the Preclassic and extending through the Late Classic. Resist decorated ceramics can be broken into two broad classes, bichrome and polychrome. In general, bichrome resists consist of abstract or geometric motifs executed in a lighter color set against a dark field. More than two colors are utilized. The production of bichrome resist vessels is uncomplicated and likely required only a single application of slip and paint. The design appears as the result of the differential oxidation of the exposed and unexposed slips. For example, the production of the gray and cream resist decorated vessels known from the Guatemalan highlands would have required the application of slip that would fire to a cream color. Areas of this slip were masked and then the vessel was fired in a reducing atmosphere. This resulted in the deposition of carbon on those areas not masked by the resisting material. The design appears as light-colored areas set against a dark field. In other cases, the design appears as dark areas set against a cream field.

Bichrome resists are widely distributed in time and space and can be found from the Yucatan Peninsula, Tabasco Plain and Belize, through Guatemala (including the Highlands) and into Honduras with dates ranging from the Middle Preclassic through the Late Classic.[1] Japon Resist (Smith 1955, Figures 5f-g; Culbert1993, Figures 21a, 27a1), Egoista Resist (Ball 1977:82, Figures 22b-d; Ball 1978; Thompson 1939), Sombra Resist (Willey et al. 1994:38, Sharer 1978), an unnamed bichrome resist from Zaculeu (Woodbury and Trik 1953:197-204, Fig. 267), and Zope Negative Dichrome from La Lagunita, El Quiche, Guatemala (Ichon and Arnauld 1985) are all examples of bichrome

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[1] A discussion of the distribution of Usulutan style ceramics is purposely omitted from this description. Though Usulutan ceramics found in El Salvador are often the products of a true resist technique, the types common in the Maya Lowlands (e.g. Metapa Trichrome, Sacluc Black-on-Orange) are executed using a “wipe off” technique whereby multiple slips of contrasting colors are applied simultaneously and then dragged across the surface of the vessel with a comb-like instrument (Culbert 2003). This results in the distinctive vertical markings characteristic of the Lowland Maya “Usulutan” types. These Usulutan-like ceramics are known from Piedras Negras.

resist decorated types.[2] Bichrome resist is known from Piedras Negras, but it is restricted to an Early Classic termination deposit found in front of Str. J-20 (Golden 2002), and similar deposits. These are the earliest resist decorated ceramics known at Piedras Negras and are roughly contemporaneous with the bichrome resists known from the Highlands and Japon Resist, and they slightly predate Egoista resist. In overall execution, the Piedras Negras bichrome resists most closely resemble the Highland examples.

Polychrome resists utilize three or more colors, may involve some positive painting, and likely require a larger labor investment that bichrome resists. Designs run the gamut from abstract/geometric through iconographic and figural. At Piedras Negras, abstract and iconographic motifs predominate, though a few figural designs are known. The exact technique by which the Maya produced resist decorated ceramics is unknown. As described in the previous section, some polychrome resist may have required multiple applications of slip and firing. This is evident from examining examples of Santa Rosa Cream Polychrome, the most common resist decorated ceramic type at Piedras Negras. These vessels were first coated with a cream under slip. This was followed by the application of resisting material and a second light orange slip. Next, a second coat of resisting material was applied, and a third coat of slip, typically a dark orange to red followed. In some cases, black line painting is used to highlight portions of the design. The painting is usually applied prior to the second application of slip.

Polychrome resists are less common and their distribution in space and time is more

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[2] Bichrome resists similar to the Zaculeu examples have also been found around Jacaltenango, Guatemala. It is not clear whether the ceramics decorated this way are found further to the east or not.

limited. Polychrome resist types found outside of Piedras Negras include Mataculebra Cream Polychrome: Mataculebra variety; Santa Rosa Cream Polychrome: Horqueta, Negra, and Interior-Exterior varieties; Moro Orange Polychrome: Resist variety; and Palmar Orange Polychrome: Resist-reserve variety. Mataculebra Cream Polychrome was first identified at Altar de Sacrificios (Adams 1972, fig. 53a-c) and appears to have the widest distribution of any polychrome resist type. Examples of Mataculebra have been found in the Central Highlands (Gordon 1944, Smith and Kidder 1951, fig. 82d, e), La Joyanca (Melanie Forne, personal communication 2002), and El Peru (Mary Jane Acuña, personal communication 2003) as well as Piedras Negras. Holley (1983:483) reports that a related type might occur at Trinidad in the Naab complex, and numerous examples of this type can be found in the Kerr archives (see, for example, K3924, K3459, K2023).[3]

The Mataculebra Cream Polychromes known from private collections generally bear exterior decorations executed on the exteriors of cylinders or barrels. The decorations are more complex than those found on the Piedras Negras examples, though they are similar to examples found elsewhere in the Peten. The use of interior decoration at Piedras Negras, as well as the emphasis on hemispherical bowls, suggests that the variety of Mataculebra found at Piedras Negras was a local product, and not an import.

Moro Orange Polychrome was first identified at Becan (Ball 1977) and placed in the Bejuco ceramic phase. This placement agrees with an observation made on the distribution of this type at Piedras Negras, where it appears primarily in the Balche and early Yaxche phases. It is not clear where this type may have originated, though Ball

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[3] Photographs can be found in Kerr 1989, and at http://famsi.famsi.org:9500/dataSpark/Maya.

(1977, personal communication 2000) suggests that the presence of this type to the north of Becan may indicate a Gulf Coast provenience. This suggestion is born out by the distribution of this type - examples have been found at Edzna (Forsyth 1983:81-83), Isla Uaymil (Ball 1978:99), Yaxcopoil (Ball 1978:116), Dzibalchaltun, Xuphil, and Hochob (Ball 1977). A few other possible examples are known from Uaxactun (Smith 1955, Figures 35b) and Calakmul (Dominguez Carrasco 1994, 1996).

A Resist variety of Palmar Orange Polychrome was first identified at Altar de Sacrificios (Adams 1971:38-39) and dated to the early facet of the Pasion phase. Adams reports that other examples of this variety are known from Uaxactun (Adams 1971:38, see also Holley 1983:467) but that neither that site nor Altar are likely origin points for the variety given its rarity at both places. The same is also likely of the Piedras Negras materials - less than two dozen sherds of this variety are recognized in the collection.

Santa Rosa Cream Polychrome, perhaps the most common resist type found at Piedras Negras, is found in almost every Yaxche phase ceramic lot excavated at the site. Santa Rosa Cream Polychrome was first identified at Altar de Sacrificios (1971:42). A possible example of this type has also been found at La Joyanca (Melanie Forne, personal communication 2002). At Piedras Negras, this type occurs in a wider range of varieties than at any other sites where it has been found, and it occurs in much greater frequency. For these reasons, it seems likely that Santa Rosa Cream Polychrome as well as some of the other resist polychrome types discussed below had their origin at Piedras Negras.

Resist and Resist-Reserve Types at Piedras Negras

The research presented here is based on observations of the changing frequency and distribution of resist and resist-reserve decorated ceramics at Piedras Negras between A.D. 550 and 750. This period includes both the Balche and Yaxche ceramic phases. The resist technique utilized during this period likely grew out of a bichrome, negative resist that saw limited distribution during the Early Classic. By Balche, this technique is more common and is used to produce elaborate polychrome designs. By the Yaxche ceramic phase (A.D. 630-750), resist and resist-reserve dominate the polychrome assemblage of the site.

Resist and resist-reserve types include an undesignated cream resist, three varieties of Santa Rosa Cream Polychrome (Horqueta, Negra, and Interior-Exterior), Mataculebra Cream Polychrome, Moro Orange Polychrome, Lacanja Cream Polychrome, Suktan Polychrome, Lemba Polychrome, Palmar Orange Polychrome: Resist-Reserve, Bolonchac Orange Polychrome: Resist-Reserve, and Yokib Incised-Resist:Yokib.[4] With the exception of Mataculebra, Moro, and Palmar all of these resist types likely had their origins in or near Piedras Negras and are not found in quantity at any other Maya site.[5]

Mataculebra Cream Polychrome, Moro Orange Polychrome, Santa Rosa Cream Polychrome: Horqueta, Suktan Polychrome, and Yokib Incised-Resist appear at Piedras

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[4] A possible resist-incised vessel is shown in Kerr 1989. This vessel bears a great resemblance to excavated sherds from Piedras Negras. Unfortunately, the provenience of this vessel is unknown.

[5] Sufficient archaeological work has been performed in the central and eastern Peten, and Belize to determine that these areas were not large-scale producers of resist decorated ceramics. The lack of archaeological work in the western Peten and the adjacent areas of Mexico make it difficult to assess the distribution of resist decoration in these areas, though preliminary reports would seem to indicate that they are somewhat more common in this zone. Until more work is completed in the area, however, Piedras Negras must be considered the likely origin point for these materials. Indeed, the low typological similarity between Piedras Negras and other Maya sites for which adequate documentation exists suggest that Piedras Negras may have been the center of a Late Classic Western Maya ceramic sphere, though the direction and extent of this possible sphere is unknown. Archaeological work in the region of Tecolote, Texcoco, and Esmerelda in 2003 failed to recover any examples of resist-decorated ceramics.

Negras between about A.D. 550 and A.D. 630. The Negra and Interior-Exterior decorated varieties of Santa Rosa Cream Polychrome, as well as Lacanja Cream Polychrome, Palmar Orange Polychrome: Resist-Reserve, and Lemba Polychrome become common after about A.D. 680 and remain common until about A.D. 730. After this time most resist-reserve decorated types disappear - only Palmar Orange Polychrome, Lemba Polychrome and a Resist-reserve variety of Bolonchac Orange Polychrome remain in use. Shortly after A.D. 810 reserve-resist ceramics disappear from Piedras Negras.

RESIST-DECORATED CERAMICS AT PIEDRAS NEGRAS

Rather than focus on the changing distribution and content of the entire ceramic assemblage at Piedras Negras, this section will focus primarily on a single aspect of the Late Classic ceramic assemblage - those types decorated using either resist, reserve or a combined resist-reserve technique. Resist decorated ceramics appear first in elite contexts. They are carefully decorated and well-fired. Through time these ceramics become increasingly common and are recovered from all areas of the site and all levels of settlement. These later examples are poorly made and decorated using similar, though less labor intensive decorative techniques. This pattern suggests initially specialized or attached production for these ceramics, with concomitant changes in the organization of production as these ceramics become more widely available. This issue can be investigated by assessing the degree to which inferred changes in the production organization of these ceramics correspond with observed shifts in patterns of consumption.

This section provides an outline of the general pattern of ceramic change observed at Piedras Negras between A.D. 550 and 750. This is done by tracking changes in the distribution and frequency of particular polychrome and bichrome types through time and space. The major stylistic changes observed during this time include, in order of appearance, the use of smudge resist decoration, the use of specular hematite decoration, and development of polychrome resist, and finally development resist -reserve. These three decorative modes are essentially unknown at Piedras Negras before A.D. 550 and, after that time, follow in quick succession, each largely replacing the other.

The inclusion of specular hematite decoration in this list may seem out of place in a chapter whose primary focus is the changing distribution of resist decorated ceramics. It is important to note, however, that the appearance of polychrome resist is simply the final and most elaborated point in a process whose earliest stages are best exemplified through time and space of both smudge-resist and specular hematite decoration.[6] For that reason, it is necessary to consider these modes together, rather than focusing on resist decoration alone.

The observations upon which the following section is based are derived from the examination of several ceramic deposits excavated from Piedras Negras between 1997 and 2000. Two of these deposits were the remains of building termination rituals that preceded new construction. Termination rituals typically consist of large quantities of pottery, figurines, and valued goods deposited, often violently, against the façades of structures prior to new construction. These events are often accompanied by burning and the in situ burial of the deposited materials by the new building episode. The remains of palace Str. J-

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[6] Despite the wide availability of specular hematite in the paint in the Maya Lowlands, its use on pottery is relatively rare. Outside of a Piedras Negras, only Copador polychromes (Viel 1993; Willey et al. 1994) from Southern Guatemala and Honduras are decorated using this material. Specular Hematite is found in the Maya Mountains, but it does not appear to have been a popular decorative material for ceramics manufactured in that area.

20 sub-1 were associated with the first of these termination deposits. The second was found in front of Str. F-2 sub-1, the focal buildings of a group north of the palace. The termination ritual in front of Str. J-20 is estimated to have taken place no later than about A.D. 560 on archaeological and epigraphic data. The termination of Str. F-2 is somewhat later and is dated to between A.D. 600 and 630.

The third deposit, though not clearly associated with a particular structure, is located near Str. N-10 and consists of ritually disposed of ritual goods, including several vessels with ownership statements indicating that at least some of the vessels in this deposit were once the property of Piedras Negras Ruler 2. This deposit dates to no later than about A.D. 690. This date is established principally on epigraphic grounds (Figure 6.1).

In all three cases, the deposits are the result of discrete acts of destruction and therefore represent an accumulation of items of roughly contemporary in manufacture and use. In addition, the ceramic assemblages recovered from these deposits are sufficiently large and well-preserved to ensure good representation of the range of ceramics comprising the total ceramic assemblage in use at that time, and they allow easy comparison between ceramics recovered from different contexts. Throughout the following discussion it is important to note that every ceramic lot excavated at Piedras Negras between 1997 and 2000 was systematically examined. Thus, statements regarding the presence/absence of particular modes through time and space are grounded in an analysis of the entire sample and not a limited subset. The excavations from which the sample was drawn were quite numerous (over 1100 excavation units) and provide a representative sample both spatially and chronologically (see Appendix C for a list of excavation units).

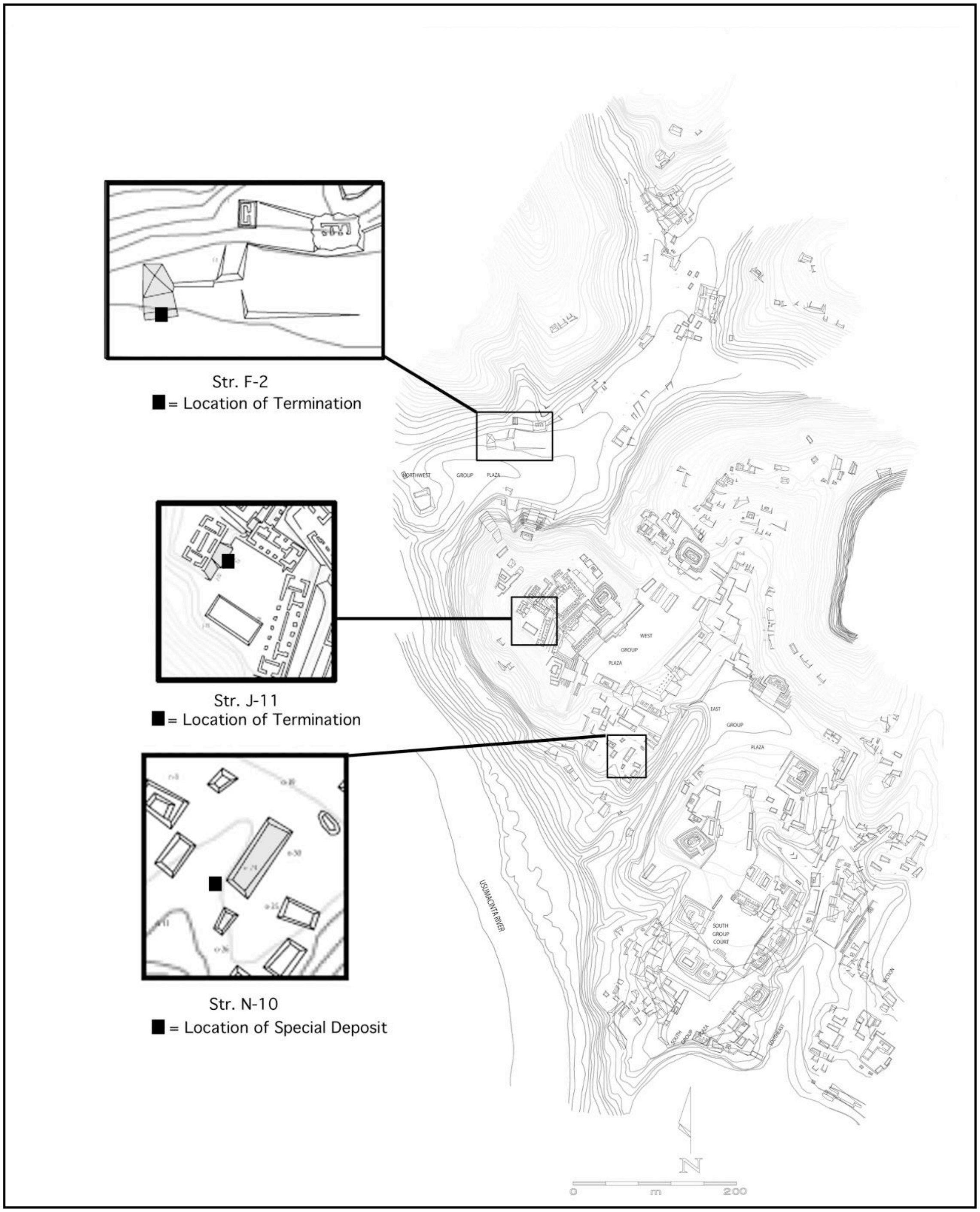

Figure 6.1 Map of Piedras Negras Showing the location of the three special deposits discussed in this chapter.

The activities associated with the creation of these deposits were very likely public and were, as a result, important venues for competitive displays. Several lines of evidence suggest to us that this was the case. First, excavations in front of Strs. J-20 and F-2 provided clear evidence that parts of the buildings and adjacent courtyard were buried beneath a layer of clay soon after the ceramics were deposited and the buildings burned. Doing this would have required considerable effort from a group of people and is suggestive of a large audience. Second, the recovered ceramics are more than sherds, they are the fragments of drinking and serving vessels, and their presence probably represents the remains of a feast that preceded the demolition of the buildings, a situation very likely similar to the termination found at Str. C-12.[7]

Finally, many of the ceramics recovered from the J-20 sub-1 deposit were decorated with incised post-fire graffiti. Though it is impossible to estimate the total number of individuals represented, it seems likely that at least several people were responsible. Many of the graffiti show crude stick figures, while others appeared to be the work of an artist, exhibiting the fluid style typical of the finest Maya art. There can be no doubt that a variety of hands were responsible for the graffiti, giving the impression that multiple witnesses and participants attended this termination (6.2).

[7] It is important to note that ethnographic house dedications are public events attended by a significant proportion of the community (McGee 1998; Vogt 1998). It seems reasonable to conclude that in the ancient past, house or building dedications and terminations were similarly public affairs.

Figure 6.2 Sherds decorated with graffiti recovered from a termination deposit found at Str. J-20 sub-1. Scale is approximately 1:2. (Illustrations by Charles Golden)

Str. J-20 sub-1

Str. J-20 sub-1 is located at the northern edge of Court Three of the Acropolis. Excavations recovered a large amount of materials deposited in a single brief episode coinciding with the burning and ritual termination of this structure (Golden 1997, 1998, 2002). In general terms, ceramics found in this deposit are consistent with Naba phase assemblages found elsewhere at the site. This deposit is clearly distinguished from middens at Piedras Negras because of the lack of domestic refuse, such as animal bone and lithic debris. This, plus the high number of partially reconstructable vessels recovered, and the fact that the deposit was found within and beneath layers of burned clay and bajareque, indicate that these materials were deposited purposefully, over a short period of time, and were intentionally smashed. It seems clear that this material was quickly buried following the end of the termination - excavation indicated that a cap of dark clay was laid over this deposit as the remains of the building continued to smolder (Golden 2002).

In addition to the numerous orange polychrome dishes recovered, a number of unique types were found, including sherds representing at least two vessels decorated in a novel style. The first was a cream slipped dish decorated with a smudge-resist design consisting of a circumferential chain of linked triangles (Figure 6.3). The second vessel was also cream slipped and decorated with a resisted design, this time consisting of a series of discs distributed across the vessels' surface. With the exception of these sherds and a few recovered from a possibly similar context elsewhere on the Acropolis (Golden 1999, 2002), ceramics of this type are known from nowhere else at the site.

In addition to these vessels, a buff-slipped basal flange dish with a broad red rim band executed in specular hematite was also found (Figure 6.3). Around the rim and painted in white is a fragment of a barely legible text, consisting of a single glyph block reading *tsib* which means 'writing'. This is almost certainly the remainder of the compound title *ah tsib* ("he of writing") which refers to the office of royal scribe (Stephen Houston, personal communication 2000). Below this glyph and on the base of the dish, the head of a *k'awil*, a deity associated with Maya kingship, is painted in specular hematite. Though the type-variety system of ceramic classification requires that this particular vessel be lumped in with a known type (Eq Red-on-Orange), the execution in terms of composition and quality of rendering is unique. However, like the smudge-decorated ceramics described above, this vessel should not be understood as simply another example of a well-defined type but rather as the unique production of a highly skilled and innovative artisan.

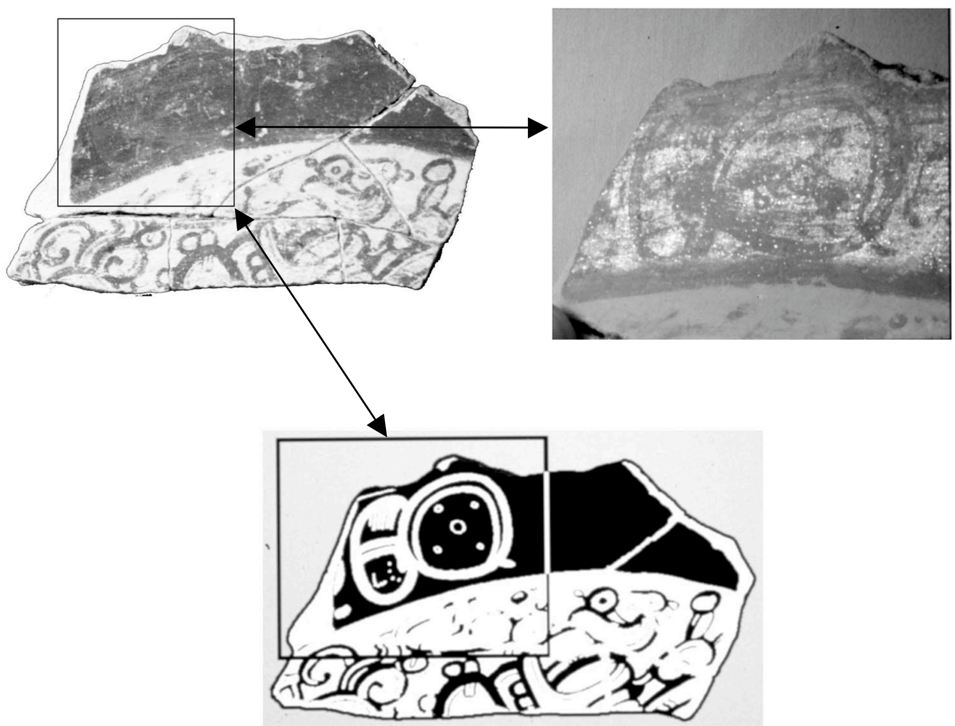

Figure 6.3 A fragment of an Eq Red-on-Orange plate recovered from the Str. J-20 sub-1 termination. The hieroglyphic text may be part of the title *ah tsib* ("he of writing") the office of royal scribe. (Photographs by Gene Ware, illustration by Stephen Houston)

Str. F-2 sub-1

Excavations in front of Str. F-2 sub-1 in the Northwest Group Plaza yielded evidence of a termination ritual very similar to the one encountered in front of Str. J-20 sub-1 (Wells 1998). Like the latter, this consisted of well-preserved, predominantly polychrome ceramics sealed under a layer of burned clay and bajareque. Though small amounts of other types of materials, such as obsidian, were recovered from this deposit, they were not in sufficient quantities to indicate that this was a midden. Instead, the location of this deposit at the base of a new structure, the obvious indication of burning, the high concentration of fine pottery, and the relatively low number of vessels represented indicate that this deposit resulted from an intentional act of destruction related, most likely, to the construction of Str. F-2-1st. Unlike the materials recovered from in front of J-20 these ceramics display an increase in modes more typical of Late Classic assemblages. Given these differences, these materials clearly postdate those found in front of J-20, though possibly by as little as 50 years, and can be placed in the Balche ceramic phase (A.D. 550-630).

At least four vessels decorated with specular hematite were found here. Most were decorated with relatively simple bichrome designs, while others were more complexly decorated, incorporating specular hematite paint into polychrome designs. In addition to these vessels, a shallow dish decorated with a hieroglyphic text was found. This vessel appears to be a variety of Saxche Orange Polychrome, but the form is not diagnostic, and, once again, this object should not be subsumed within a generalizing type-variety category. Like the hieroglyphic plate recovered from in front of J-20, this decorative standard of this vessel appears to be unique at Piedras Negras. Unfortunately, issues of preservation prevented translation, but the presence of this text suggests that the vessel’s owner was a member of the Piedras Negras elite. In addition to these pieces, there are a number of vessels decorated with resist decoration suggestive of those found later Yaxche phase deposits, such as the one excavated from in front of Str. N-10.

Str. N-10

Finally, excavations near Str. N-10, south of the Acropolis and West Group Plaza, uncovered a deposit containing a large amount of well-preserved ceramic vessels and figurines. This deposit contained the remains of at least twenty partially reconstructable vessels (Arredondo 1998a; Muñoz and Fitzsimmons 1998), including at least four, and possibly eight to ten, resist decorated vessels. Additionally, the remains of several hieroglyphic vessels were found. Three were shallow bowls incised with the name of Piedras Negras' Ruler 2 (Figure 6.4). It is likely that these bowls as well as the other materials in this deposit were manufactured during his reign (A.D. 639 to A.D. 686) and deposited shortly after his death. Unfortunately, the nature of this deposit is not clear - there is little evidence for burning, and the architectural associations are unclear. As a result, it is difficult to positively identify these materials as the result of an architectural termination. However, the array of materials in this deposit is very similar to that recovered from building terminations (D. S. Walker 1998) and this deposit may be the remains of items disposed of as ceremonial trash (Fitzsimmons and Muñoz 2000; W. Walker 1995).

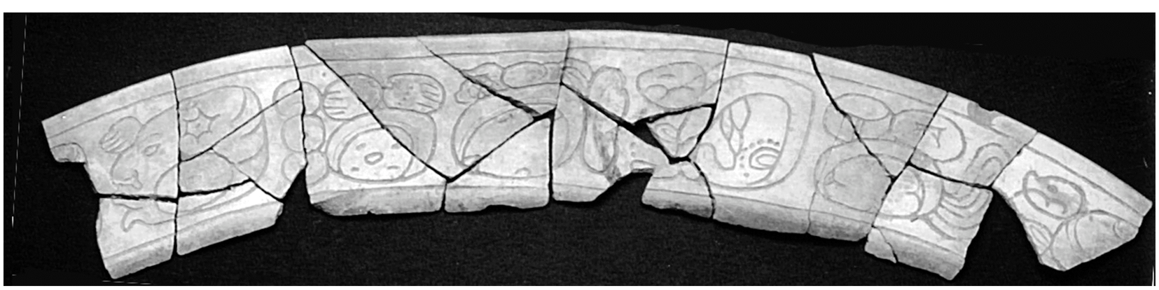

Figure 6.4 Paqal Incised Bowl Decorated with the Name of Piedras Negras Ruler 2. This bowl was recovered from the deposit near Str. N-20.The full text specifies the function of the bowl as a container for atole. (Photograph by Jorge Perez de Lara).

In addition to the incised hieroglyphic bowls, the remains of at least two other hieroglyphic vessels with cream colored, black-outlined glyphs resisted through a deep orange slip were found here. The hieroglyphs are identifiable phonetic syllables, but are not arranged in a legible order (Stephen Houston, personal communication 1998). Moreover, sherds of least two resist-incised vessels were found. Their exteriors are decorated with well-executed incised designs comprised of figural and vegetal elements. Portions of the incised decoration are highlighted, with cream and orange areas resisted through a black slip. Close study suggests that the pattern of resist evident on these sherds could have been accomplished only by multiple firings, indicating that the individual responsible for creating this vessel was a highly accomplished artisan.

Discussion

Examining these deposits from a synchronic perspective, a number of similarities are noticeable. In two of the three cases, the deposits are located in fairly restricted or specialized settings. This suggests attendance by an exclusive audience. Court Three of the Acropolis is by far the most restricted context, and it is likely that only the very highest members of Piedras Negras society could access this space. Structure N-10, the location of the deposit containing the vessels incised with Ruler 2's name, is less restricted, but the most obvious access route is through the West Group Plaza, at the foot of the Acropolis, and then through a narrow corridor between the Acropolis and a monumental royal sweat bath. Str. F-2 is the least restricted of the three and is located at the northern edge of the site, on the north side of a plaza facing a pyramid.

This inference of exclusivity is further supported by the preponderance of well-made polychromes, many of which appear to be unique types, or, if they can be subsumed within standard typologies, represent unique varieties exceptionally rendered in terms of the quality of decoration. Additional support for this inference is found in the presence of Ruler 2's name on several of the vessels recovered from near Str. N-10, the probable appearance of a title, *ah'tsib*, on the vessel recovered from in front of J-20 sub-1, and the presence of at least a single hieroglyphic vessel from the F-2 deposit.

Taken together, these facts suggest that the people who participated in these events were the highest members of the Piedras Negras sociopolitical hierarchy. Given our understanding of the production organization for some polychrome ceramics, it seems likely that embedded artisans produced at least a few of the vessels found in these deposits. Our most direct evidence for this is the presence of the scribal title, *ah'tsib*, found on the vessel recovered from the J-20 sub-1 termination, though the presence of legible hieroglyphic inscriptions in all three deposits indicates the work of scribes. The N-10 deposit, though not an architectural termination, likely represents the ritual disposal of particularly valued and highly charged possessions that were, like the materials destroyed in the architectural terminations, the products of embedded specialists.

Examining these deposits diachronically, the effects of these artisans' decisions on the direction of ceramic technology at the site as a whole are clear. To reiterate, the concern here is with the changing frequency and distribution of three decorative modes - smudge resist, specular hematite decoration, and polychrome resist. These three modes follow one after the other, beginning with smudge resist, and all appear first in elite contexts. While both specular hematite and polychrome resist decoration become major features of the ceramic assemblage, smudge resist never gained in popularity. This fact serves as a counter-example to the process described, but is equally illustrative.

Smudge Resist

Smudge resist is found only in the J-20 sub-1 termination and in a few contemporary contexts elsewhere on the Acropolis. In contemporary, non-elite contexts, no sherds with smudge resist decoration have been found. In addition to the limited spatial distribution, smudge resist appears to have a very limited temporal distribution. Stratigraphic, modal, and C-14 analyses all indicate that the J-20 deposit most likely dates to the second half of the sixth century A.D., placing it squarely within the latter part of the Naba ceramic phase. The other contexts from which this material has been recovered demonstrate the same array of ceramic modes, suggesting that these contexts are roughly contemporary (see Golden 2002: 238-245). Other Naba Phase deposits, both on the Acropolis and elsewhere at the site, that are slightly earlier or later than the J-20 sub-1 assemblage do not contain smudge resist decorated ceramics.

In sum, the temporal and spatial distribution of smudge resist decorated ceramics suggests that the knowledge necessary to produce this pottery was either not known or not available to the majority of local potters. This is despite the fact that 1) chemical characterization of the smudge resist sherds indicates that they were locally produced, and 2) that this is an uncomplicated decorative technique that can be done without the use of exotic materials (Shepard 1955, Woodbury and Trik 1953). These facts suggest that the production of this material was limited to relatively few individuals, who, given the context, were possibly elites. Furthermore, the popularity of other decorative modes found here suggests that the decision to abandon smudge resist must be related to particular social and historical factors.

Specular Hematite

Like smudge resist, the earliest uses of specular hematite had a very limited spatial distribution. One of the earliest and most exorbitant uses of specular hematite is found on the plate recovered from the Str. J-20 sub-1 termination. This plate features a broad red rim band and painted decoration executed in specular hematite. It contains a portion of a possible scribal title as well the painted image of a *K'awil*, a symbol of kingship. Vessels decorated with specular hematite are known from only a few contemporary contexts and no other examples demonstrate the same degree of either technical proficiency or extravagant use of specular hematite as the J-20 sub-1examples. Furthermore, the manner in which it was used, to decorate a plate bearing symbols of kingship and a possible scribal title, suggests that specular hematite, as a material for use in ceramic decoration, was available to only a small part of the Piedras Negras population.

Through time, however, the use of specular hematite became an increasingly common decorative mode. By the time of the F-2 termination (c.a. A.D. 600), specular hematite is so widespread that it is recognized as diagnostic of the Balche ceramic phase (A.D. 550-630), which falls in the century following the demolition of Str. J-20 in the mid-sixth century. Excavations in front of Str. F-2 recovered at least four semi-complete vessels decorated with specular hematite. The hematite on the vessels recovered in front of Str. F-2 lacked the brilliance and deep color of the hematite-decorated vessels found in the J-20 sub-1assemblage. This difference probably results from the adulteration of the hematite with another red pigment, and suggests changes in production organization concomitant with changes in consumer audience. More specifically, these changes in the appearance of the specular hematite, plus the observed changes in decorative motif and overall frequency, indicate that a larger number of potters engaged in the production of these wares and that this likely echoed an attendant increase in the number of consumers.

After about A.D. 680, specular hematite was no longer used for the decoration of ceramics at Piedras Negras, despite the fact that it continued to be traded into Piedras Negras and was a relatively common material in the decoration of architectural façades. This is an important point, as it indicates that the decision to incorporate hematite into ceramic decoration, as well as the later decision to abandon its use on pottery, was local, historically specific, and socially meaningful and was not necessarily related to the availability of that material. In fact, it is very likely that the decision to abandon specular hematite on pottery was directly related to the appearance and increasing popularity of polychrome resist decorated pottery at Piedras Negras.

Polychrome Resist

Some of the earliest polychrome resist decorated ceramics at Piedras Negras are found in the termination deposit excavated from Str. F-2, dated to the Balche ceramic phase (A.D. 550-630), and from a few contemporary deposits on the Acropolis. Two of the resist types found in the F-2 deposit are similar to resist decorated ceramics known from other Maya sites (Moro Orange Polychrome, in Ball 1977; Mataculebra Orange Polychrome, in Adams 1971), while two others (Santa Rosa Polychrome and Suktan Polychrome) were first identified at Piedras Negras (Holley 1983:499). All four of these types have some relation, in terms of palette and decoration, to polychrome resist vessels found in later contexts. Two of these types, however, Moro and Mataculebra polychromes, are most frequent in the Balche ceramic phase and disappear from the site after that time. The remaining two types, Santa Rosa Cream Polychrome and Suktan Polychrome, continue to be produced in increasingly large quantities and until approximately A.D. 750, after which time their popularity quickly waned.

Some of the earliest and mostly finely executed examples of these two types (Santa Rosa Cream Polychrome and Suktan Polychromes) were found in the deposit located near Str. N-10. While some positive painted polychromes of relatively common types were found in this deposit, resist polychromes were by far the most common frequent pottery type. The high quality of the pottery found within this deposit, as well as the presence of Ruler 2's name on several vessels, suggests that the deposit represents the disposal of royal refuse. Resist decorated vessels similar to these are almost invariably found in elite contexts dated by the appearance of other, independent modes to early facet Yaxche phase (ca. A.D. 630-680). These ceramics are rare in contemporary non-elite contexts. The context of the earliest resist polychromes suggest they were the product of a limited number of artisans working exclusively or nearly so for members of the royal court. After about A.D. 680, resist decorated ceramics are found in a wide variety of contexts, and at all levels of settlement. They become so common, in fact, that the positive painted polychromes typical of Classic Maya sites elsewhere become a minority type in the Piedras Negras assemblage.

Polychrome resist pottery from later contexts is distinguishable from earlier iterations principally through the greater diversity of applied designs and the use of a combined resist-reserve technique. The true polychrome resists from Piedras Negras may have required two or more firings to reach their final appearance and were thus labor intensive and possibly subject to a high rate of failure resulting from the necessity of multiple firings. Resist-reserve, however, can achieve results similar to those achieved using resist alone, but because only a single application of slip and paint and only a single firing are required, it demands less of the potter's skill and time. Thus, reserve decoration may be considered a cost and labor-saving effort on the part of the potter. These changes in decorative technique and motif, in combination with the expanded distribution of this material, suggest that a much larger number of producers and consumers were responsible for the manufacture and utilization of resist decorated pottery.

Hypotheses

The decision to focus on resist decoration as the primary polychrome mode in the early Late Classic had a lasting effect on the options available to later potters. Polychrome resist and, later, reserve decorated vessels became the dominant polychrome mode at Piedras Negras. The positive painted figural or iconographic decoration so commonly associated with the Late Classic Maya were, in fact, minority types through most of Piedras Negras' history. Given the contexts in which the earliest resist decorated ceramics are found, and given the organization of production likely for some classes of elite goods, it is likely that resist decoration was the intentional result of experimentation and regulated improvisation and was intended, consciously or not, as a partial solution to particular social, cultural and technical problems facing the Piedras Negras elite at a critical juncture in their history.

While some of this pottery may have been singular pieces reserved for the exclusive use of one or just a few individuals, it seems likely that other classes of pottery made within elite households came into wider circulation through any number of redistributive mechanisms - the role of elaborate polychrome ceramics as a political currency deployed to bolster inter- and intra- elite relationships has been well-documented for the ancient Maya (e.g. Lecount 1996, 1999, 2001; Reents-Budet 1998; Reents-Budet et al. 1994, 2000; Taschek and Ball 1992; see Foias 2004 for an extended discussion). As these unique pieces were seen and circulated, the particular style in which they were executed gained in popularity and was reproduced, through either replication or imitation, on an increasingly broader scale. The result was the creation of a regional ceramic style.

This conclusion is based on the observed changes in the distribution of polychrome resist decorated ceramics through time and space. To summarize, the earliest examples of polychrome resist pottery are found in Balche and early facet Yaxche phase contexts. They are well-made, carefully decorated, and found associated with the only most elite residences. These assemblages are notable because of a low frequency of resist-reserve decorated vessels. An early facet Yaxche phase date for these assemblages is appropriate because of the vessel forms represented, the use of specular hematite decoration on positive painted bichromes and polychromes, the association with vessels decorated with the name of a specific ruler, and the context. Over time, resist-reserve types become increasingly common and are recovered from all areas of the site and from all levels of settlement. These changes in the distribution of resist-reserve decorated ceramics are accompanied by changes in the frequency of reserve decoration relative to resist decoration. By late facet Yaxche, reserve decorated ceramics are much more common than vessels decorated using resist alone. By early Chacalhaaz, both resist and reserve decorated ceramics are rare, and there are no significant differences in their distribution.

These changes in the distribution of resist and resist-reserve decorated ceramics are accompanied by changes in vessel forms, decorative motifs, and labor investment. The majority of early resist decorated vessels are decorated with relatively complex geometric, abstract or figural designs. It is likely that they represent a higher labor investment than do the resist-reserve decorated ceramics. Many of these vessels would have required multiple applications of slip and resisting material and multiple firings to achieve their final appearance. In contrast, the later reserve-resist ceramics are generally decorated with less complex motifs, utilize a combined resist and reserve decorative technique and would have required only a single application of slip and paint and only a single firing before completion.

Costin and Hagstrum (1995; see also Costin 1991) suggest that the technological characteristics of an object, including inferred labor investment, may suggest the particular mode or modes of production in sociopolitical as well as reflect the nature of the producer-consumer relationship. The changing distribution, frequency, and decoration of resist-reserve pottery suggests changes in the organization of production for these ceramics. This, in combination with the observations regarding the distribution of resist-reserve ceramics through time and space, provides a series of hypotheses concerning the organization of ceramic production amenable to quantification and testing.

First, it is hypothesized that the earliest resist decorated ceramics were manufactured by specialists potting principally for members of the royal court and/or other high-level elites. Second, it is hypothesized that as resist decorated ceramics became more common, they were produced by potters working in shops across the site. These modes of production have measurable archaeological traces and agree with prior research on the production and distribution of Maya ceramics and other craft goods (Ball 1993; Fry 1979; Fry and Cox 1974; Lecount 1999; Rands 1967a, 1973; Rands and Bishop 1980; Reents-Budet et al. 1994, 2000; Rice 1987a; Taschek and Ball 1993).

Measures of relative standardization have proven a useful means for inferring the organization of production in archaeological and ethnographic studies (P. Arnold 1991; Benco 1988; Hagstrum 1985; Kvamme et al. 1996; Longacre et al. 1988; Sinopoli 1988; but see P. Arnold 2000 and B. Stark 1995). Modern potters producing for a large market tend to make more standardized products than potters producing for a specialized market. This is a result of learned motor habits, consumer expectation, and other market demands such as transportability. The same demands necessitating standardization in mass-produced ceramics are not necessarily constraints facing potters producing for specialized markets. These potters may have more freedom to experiment and may produce more diverse products (Arnold and Nieves 1991; Rice 1992).

This suggests two axes for data collection. First, resist decorated ceramics produced under differently organized systems of production may demonstrate differences in the degree of metric and decorative standardization. These differences will be evident in various vessel attributes. Ceramics made by attached specialists, because they may be producing for a small group of consumers, may show greater decorative variation than vessels produced by potters producing for a much larger market.

Second, paste composition and/or paste recipe may be more variable for independent producers than for attached specialists. Differences in paste composition and paste recipe may indicate different production loci - the greater the number of producers and the greater the number of possible production loci, the greater the measurable variability in past recipe and paste trace element composition (Arnold et al. 1999; Bishop 1975; Bishop et al. 1982). Intra-site differences in paste recipe and paste composition, if they are great enough, are measurable through the use of instrumental neutron activation analysis.[8]

CONCLUSION

Between A.D. 550 and A.D. 750, the ceramics of Piedras Negras underwent a series of profound changes that ultimately resulted in the creation of a regionally distinct ceramic style. The ceramic diversification evident at this time coincides with several key events in the history of Piedras Negras, including its establishment as the principal center for the region as well as the stabilization of the dynasty that would head the Piedras Negras polity for the next 200 years. At no other point in the ceramic sequence does change appear to happen so dramatically or so regularly as at this time. The eventual outcome of this process was the creation of a regional ceramic style.

Many authors have noted the increasing regionalization in Classic Period

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[8] Metric standardization may also provide some insight into production organization. This approach was not practicable at Piedras Negras for several reasons which are discussed in the following chapter.

polychromes (Ball 1977; Fry 1969; Reents 1983; Reents-Budet 1994; Reents-Budet and Macleod 1994; Smith and Gifford 1965; Rice 1987a). At many sites, the development of these regional styles was manifested by the increasing elaboration of polychrome decoration within the same technological and organizational scheme, a process that Inomata has described as "involutionary" (Inomata 2001:333). In contrast, the elite artisans at Piedras Negras, rather than focusing on the elaboration of extant painting styles, chose to create an entirely new technology of ceramic decoration, one that diffused from the most elite sectors of society to the least. In more general terms, this was a process whereby a class of ceramics originally defined by their rarity, locus of production, and technology as high-status were transformed into everyday possessions held by the majority and widely produced for economic gain.

This model for the creation and dissemination of resist technology and the implied differences in consumer audience as suggested by the observed changes in the distribution of resist and resist-reserve decorated ceramics can be tested through measures of standardization in decorative motif and paste recipe and labor investment. In short, the ceramics found in the most elite contexts are expected to have been the products of a few specialists working exclusively, or almost so, for the most elite members of Piedras Negras society. The later resist and resist-reserve ceramics are expected to have been produced by a much larger number of artisans whose products were distributed to a much larger and less restricted consumer audience. These differences in production organization should result in differences measurable along the parameters described above. The results of these analyses will be presented in the following chapter. The implications of this study for understanding processes of stylistic and technological change both in the Maya Lowlands and more generally will be discussed in the final chapter.

Chapter 7

INSTRUMENTAL NEUTRON ACTIVATION AND MODAL ANALYSES

At Piedras Negras, the development of a resist decorated ceramics seems to have resulted from a need on the part of the site's elites to distinguish themselves materially from others both within and without the site. This was manifested most obviously in changing programs of monumental art and architecture as well as more subtly in ceramics. The possibility that the development of resist decorated ceramics resulted from these same processes is suggested first by the timing of the first resist decorated ceramics and the context in which these materials are first found, and second by archaeological, ethnographic, and ethnohistoric analogs emphasizing the meaning inherent in goods crafted by elites for elite consumption. The discussion in the previous chapter culminated in the presentation of some hypotheses regarding decorative and compositional variability, which if, supported, would provide some validation for the proposed model.

The assumption underlying these hypotheses is that ceramics manufactured under differently organized systems of production are expected to show more or less variability in several aspects of vessel morphology, including paste composition, decorative diversity and morphological standardization. Ethnographic and ethnohistoric data suggest that craft products manufactured by specialists for a specialized audience may be expected to show less variation in paste recipe and greater decorative diversity than goods manufactured for a more general audience. Production for a larger audience requires a larger number of producers selecting and preparing clays from more diverse sources and with more variation in paste preparation. At the same time, consumer expectations regarding appropriate designs, including motif and organization, work to limit decorative diversity.

In presenting and reviewing these data, it is important to point out that standardization is a relative measure - there is no absolute standard against which standardization, whether paste composition or decorative diversity, can be measured. Standardization is "a relative degree of homogeneity or *reduction in variability* in the characteristics of the pottery..." (Rice 1992:261, emphasis added). Given the distribution of resist and resist-reserve decorated ceramics during the late Yaxche and early Chacalhaaz ceramic phases, I assume that these were manufactured by potters working across the site and should be distinguishable from their early counterparts along the lines presented in the following table (Table 7.1).

Table 7.1 Hypothesized Differences in Vessel Standardization/Diversity

	Early Resists	**Late Resists**
Paste Recipe	Less Variable	More Variable
Vessel Decoration	More Variable	Less Variable

Methods, Data, and Results

There are two ways to consider the data for the changes in production organization outlined in the previous section. The first stems from the processes of establishing a type-variety classification, the second from the examination of compositional and modal data.

In reviewing the stratigraphic, epigraphic, and ceramic data from Piedras Negras, it is apparent that there are a larger variety of resist and resist-reserve decorated types being made during the late Yaxche and Early Chacalhaaz ceramic periods (Appendix E). Furthermore, much of this material appears to be more poorly manufactured and more widely distributed relative to the earlier resists. This fact alone indicates a diversification in resist and resist-reserve decorative modes beyond the limited number of types produced early in the history of this technology. It does not, however, say anything at all about where this technology may have originated or under what conditions it may have first appeared. In order to test these hypotheses, it is necessary to consider other, more sensitive markers of production organization. As outlined above, these include studies of paste composition and vessel decoration (organization, palette and motif). The following describes the sampling strategy employed in selecting sherds for the analyses described above, the results of those analyses, and what this might tell us about the processes of ceramic change at Piedras Negras.

Instrumental Neutron Activation Analysis: Methods, Data, and Results

Instrumental Neutron Activation Analysis (INAA) is a nuclear chemical technique for determining the trace element concentrations in a variety of materials. Discussions of the methods employed in INAA can be found in Perlman and Asaro 1969; Harbottle 1976; Bishop et al. 1982; Blackman 1986; and Neff 2000. Despite the fact that the analytical processes of INAA are well understood, there are numerous difficulties in using the derived data. Investigators are limited by the fact that they cannot directly observe the natural and cultural processes affecting the elemental composition of the pastes utilized in the manufacture of archaeological ceramics or the distribution of those ceramics. As a result, INAA data cannot be used alone as a baseline for archaeological interpretation. Instead, archaeological, spatial, and temporal data at both the site and regional level must be brought into the analysis to contextualize and interpret INAA data.[9]

The analysis of the data collected during the final stage of INAA consists most frequently of cluster or factor analyses designed to sort ceramics into statistical groups on the basis of trace element concentration. Often this can be accomplished through the comparison of just one or two elements or through more elaborate multivariate procedures, including factor analysis. Studies involving the use of INAA have been criticized on the basis that the statistical procedures employed in INAA tend to create groups that may be more the result of analyses rather than meaningful patterns existing somehow independent of the means of analysis.

This concern however, is misplaced in most, though not all cases. Often the procedures employed are rather straightforward - the differences in paste composition that are the basis of group formation may result from comparisons of elemental concentrations rather than the result of elaborate statistical manipulation. To anticipate some of the results presented below, a major compositional difference differentiating Early Classic from Late Classic polychromes resulted from differing correlations

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[9] Numerous studies have also investigated the natural and cultural sources of variation in the elemental composition of ceramic pastes and clays in order to better understand those factors and their role in archaeological interpretation. Several studies have investigated the role of tempering and paste preparation in effecting the elemental composition of clays, while others have focused on the effects of various post-depositional factors on elemental composition of archaeological ceramics (Arnold et al. 1991, 1999; Neff et al. 1988, 1989)

between iron and chromium. This comparison required nothing more than log normalizing the concentrations and plotting one against the other.

In those cases, however, when rather more elaborate statistical procedures are employed, the meaning of the resultant groupings is somewhat more obscure. This does not mean that the differences in groups are only a creation of the analyst. Rather, what is at issue is the relevance of these groups in addressing the questions asked of the analysis. Stated another way, at what level do differences in paste composition reflected by INAA cease to become meaningful? This question has no single answer and can only be addressed by the careful consideration of the INAA derived groups in light of archaeological, stratigraphic, spatial, and other data.

The compositional data from Piedras Negras was examined for differences within and between groups of resist and resist-reserve decorated pottery sorted by time. The goal of this analysis was the determination of whether or not there were compositional differences relating to clay source utilization or paste preparation with the sample of selected pottery. This approach to the analysis of compositional data has been used throughout the Maya Lowlands to model trade, establish provenance, and study changes in production organization. In the case of the Piedras Negras resists, the appearance of distinct compositional groups would indicate differences in the production organization of resist decorated ceramics from early and late periods.

Instrumental Neutron Activation Analysis: Sample Selection and Sample Preparation

Samples were selected for INAA analysis in the course of preparing the Piedras Negras ceramic typology. For the purposes of the proposed research it was necessary that the resist decorated ceramics selected for analysis come from unmixed lots that were identifiable as either early or late Yaxche or early Chacalhaaz on the basis of evidence independent of the materials being sampled. In other words, it was necessary to select sherds from deposits associated with dated monuments, with other epigraphic data, or that stratigraphically must date to the periods under study. For example, several resist decorated sherds were selected from provenience 24B-1-4. In addition to containing a large amount of resist decorated pottery, this stratigraphic unit contained several sherds decorated with specular hematite as well as fragments of several bowls incised with the name of Piedras Negras Ruler 2. Ruler 2 died in A.D. 686. Therefore, the materials in this lot likely were manufactured before his death and date to the early Yaxche ceramic period.

The selection of specific sherds was based on a number of criteria, including their representativeness with regard to the composition of the sample and their preservation. The representativeness of a sample was assessed in relation to the composition of the assemblage as a whole - an effort was made to include examples of all common vessel forms as well as of all common decorative motifs. Because no effort was made to sample only those pieces that appeared unique, the possibility exists that some interesting variation in the paste composition may have been missed. At the same time, the sampling strategy employed allows greater confidence in any of the groupings that do appear as a result of the compositional analysis. A total of 218 samples from resist and resist-reserve decorated ceramics were collected. Of these, 101 samples were randomly selected for analysis. The breakdown of these samples by period and decorative technique is shown in Table 7.2.

Samples of the pottery were extracted and analyzed using the standard procedures of the Smithsonian Institution - NIST neutron activation program (Blackman 1986). The pastes from which most of the Piedras Negras pottery is manufactured are prepared from clays weathered from local limestone and contain a large proportion of calcium-bearing non-plastics, most likely resulting from the addition of crushed carbonate rock during paste preparation. As a result of the temper and the low abundance of elements contained in the clays, several elements were at or below detection limits and were omitted from the final analysis. Twenty-two elements were quantified, of which 19 had adequate analytical precision (Na, K, Sc, Cr, Fe, Rb, Sb, Cs, Ba, La, Ce, Sm, Eu, Tb, Yb, Lu, Hf, Ta, and Th). Of these, K, Rb, Ba, and Tb had several values missing. Cobalt, an easily quantifiable element, was omitted because of occasional contamination resulting from the use of a tungsten-carbide drill bit used for sample extraction. Sodium, which may concentrate as a result of post-depositional processes, was also omitted from the final analysis. Data synthesis ultimately employed the concentrations of 11 elements: Sc, Cr, Fe, La, Ce, Sm, Eu, Yb, Lu, Ta, and Th.

Table 7.2. INAA Sampling by Time Period and Decorative Technique

Period	**Smudged -Resist**	**Sta. Rosa Resist**	**non- Sta. Rosa**	**Resist- Reserve**	**Incised- Resist**	**Totals**
Naba	4					4
Balche	3		1			4
Early Yaxche	7	26	14		4	51
Late Yaxche		6	4	8		18
Early Chac.		7	5	12		24
Totals	14	39	24	20	97	101

Instrumental Neutron Activation Analysis: Results

The Resist/Resist-Reserve data set was transformed into log values to reduce the effect of major variations in elemental concentrations masking any variation attributable to those elements in trace concentrations. Following this, the data were subject to a cluster analysis. A matrix of Euclidean distance was joined by an average linkage algorithm to produce a tree diagram summarizing sample similarities. Nine potential compositional groups, labeled A thru I, emerged from this analysis. The linkages between these groups were shown graphically on a tree diagram, with strong breaks in the tree structure indicative of possible compositional differences.

The cluster analysis and tree diagram provide an initial means for sorting the samples into compositional groups. However, they are only a starting point of the analysis. The clustering program and tree diagram are based on overall sample-to-sample similarities compressed for presentation in two-dimensional form. An approach taking into account patterns of sample relationships when elemental correlations are considered is more appropriate for data from a site like Piedras Negras, where the addition of variable amounts of carbonate temper can introduce correlations among the determined elements.

Group A was a trial group from which the patterns of elemental correlations were extracted and Mahalanobis distances from the multivariate group centroid calculated for each sample. The Mahalanobis distance addresses the question of whether a particular case my be an outlier relative to a particular group of data. During the first iteration of the evaluation, all samples from trial group B were found to have > 5 percent probability of belonging to the core group (trial group A), thus A and B were combined.[10] Membership probabilities were again calculated, now based on the combined AB group as the standard. This process was repeated for all remaining trial groups, with recalculation of the standard following each iteration as individual samples were found to be within or without the 95 percent confidence interval relative to the standard group centroid. The purpose of this procedure was to produce compositional grouping based on elemental correlations having greater than a 95 percent probability of lying outside the standard group centroid.

The results of this procedure were that all members of trial groups E, F, G, and H were found to be outside of the 95 percent confidence interval of the combined reference group. Trial group C, consisting of only two samples, had probabilities of membership below .001 percent. One sample of Group I (n=4) did have a probability of greater than 5 percent of belonging to the core group.

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[10] This can also be understood this way - all members of trial group B had a 5 percent or greater chance of being outliers of Group A rather than representing their own compositional entity.

Instrumental Neutron Activation Analysis: Discussion

The majority of the analyzed Santa Rosa polychrome ceramics fall within a single major statistical group (Figure 7.1). The fragmentation of this group observed on the tree diagram reflected the formation of spherical clusters based on absolute measurements in elemental space. When correlations were considered and group membership probabilities assessed, four of the groups were found to merge. Groups E and F are notably different in composition, have chromium values less than half that of the combined AB group. They also vary in different ways from the core group in the iron concentrations. Thus, while a resource of unknown size was used for a most of the Resist/Resist-Reserve polychrome, it is clear that more than one resource was exploited for the production of the pottery.

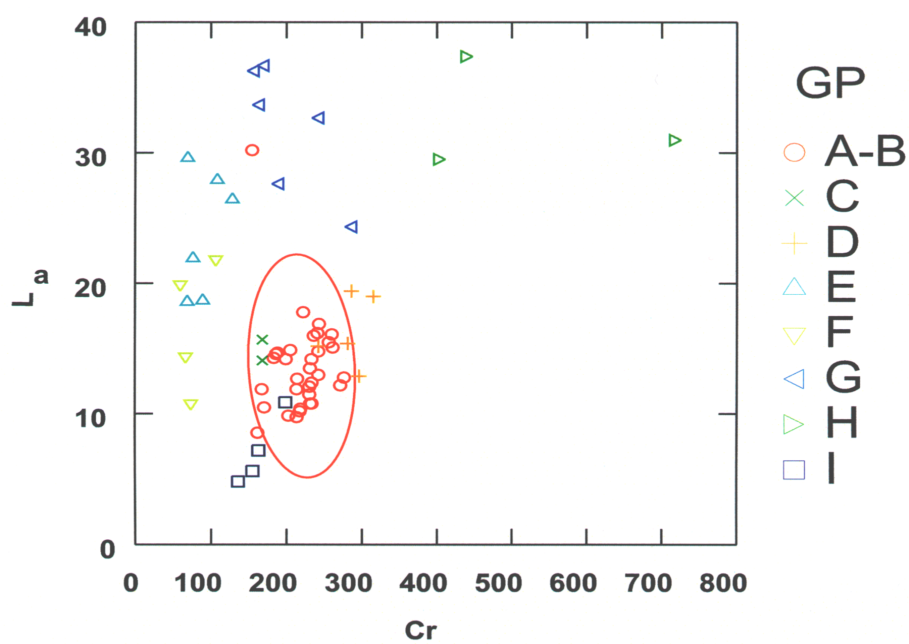

Figure 7.1 Plot Showing absence of distinct compositional groups by ceramic type, decorative technique, or phase. The column on the right identifies groupings of sherds defined by decorative mode and hierarchical cluster analysis.

There is no evidence indicating a compositional difference between early and late Resist/Resist-Reserve ceramics. The late Resist/Resist-Reserve ceramics are present in all groups except Group I (four samples). Within the resolving power of the analyses and the limits of the sampling, if there are changes in the production organization of resist and resist-reserve decorated ceramics between the two periods, it is not reflected in the compositional data.

Inspecting the data relative to the structural properties of the AB core groups allows us to determine whether Santa Rosa was compositionally distinct from other resist and resist-reserve decorated pottery. Of the 26 “non-Santa Rosa” resists, 15 had probabilities of belonging to the AB core group ($p>0.05$). All six of the samples of smudged resist pottery were found to lie within the 95 percent confidence of the AB Santa Rosa core group. These data failed to detect compositional differences between the resist (core group, AB) and the resist-reserve pottery.

These results indicate that the resist and resist-reserve decorated pottery were produced by potters with a shared knowledge of resist techniques, including access to similar clay resources and, most likely, tempering recipes. The latter is difficult to specify except that when considering the carbonate-tempered resist ceramics of Piedras Negras, the concentration of elemental calcium is 20 percent. Calcium is determined by INAA with known analytical error, and a 20 percent range of variation over a group 101 specimens is often associated with a well-defined group of carbonate-tempered pottery (Bishop, personal communication, August 8, 2005).

Ultimately, the resist pottery must be examined relative to an expanded body of carbonate-tempered pottery from Piedras Negras to assess more accurately just how different it was (or was not) relative to a more encompassing view of Piedras Negras ceramic production. Despite the lack of distinct Late Classic compositional groups reflecting differential clay source utilization or paste preparation as a result of changing ceramic production organization, there is evidence to suggest that there were some shifts in ceramic production at the Early Classic/Late Classic interface that may reflect more general changes in the organization of ceramic production. At many sites in the Maya Lowlands, the Early Classic/Late Classic break is manifested most clearly in changing ceramic styles. Early Classic monochrome black, brown and orange slips give way to monochrome red slips. Polychrome decoration, usually limited in the Early Classic to abstract or geometric representations, becomes increasingly iconographic, narrative and textual. Surface penetration decorations such as incising or carving become less common during the Late Classic. In addition to these decorative changes, vessel and rim forms also change - basal flange plates and hemispherical bowls disappear, jar necks become longer relative to orifice diameter, and bolstered rims become less common. The changes listed here are specific to Piedras Negras but can be extended to sites elsewhere in the Southern Maya area.

The changes in the decorative modes, vessel forms, and distribution of Late Classic and Early Classic ceramics suggest changes in ceramic production organization. Not only were more potters necessary to produce the increased amounts of pottery visible archaeologically, these potters were also participating in learning frameworks that allowed for the production of novel decorative and formal modes.

These changes may also demonstrate a shift in the pattern of clay source utilization and paste preparation between Early and Late Classic ceramics from Piedras Negras.

An analysis of both fine paste and carbonate-tempered ceramics from Piedras Negras indicates that there are two distinct compositional groups defined by variations in the relative concentrations of chromium and scandium (Figure 7.2). While both groups contain Late Classic pottery, the lower group contains *all* of the analyzed Early Classic pottery. The upper group, in contrast, contains exclusively Late Classic pottery, including the majority of fine pastes. The differences in paste composition demonstrated by this analysis, though subtle, are suggestive of the kinds of differences in paste recipe or clay source utilization that may follow changes in ceramic production organization. Given the magnitude of the change between Early and Late Classic ceramic modes, the magnitude of the concurrent sociopolitical changes of which they were a part, and the subtlety with which this change is marked in paste composition, it should be no surprise that the change in Late Classic ceramics discussed in this dissertation was not visible analytically.

It is possible that the changes in ceramic production visible archaeologically may not have had an analytically visible effect on paste compositions, though paste preparation practices may have differed significantly. Furthermore, given the potential homogeneity of the clays in the Piedras Negras region and the lack of distinctive tempers contributing to compositional diversity, INAA may not be the most appropriate technique for detecting differences in paste recipe, only the most sensitive.

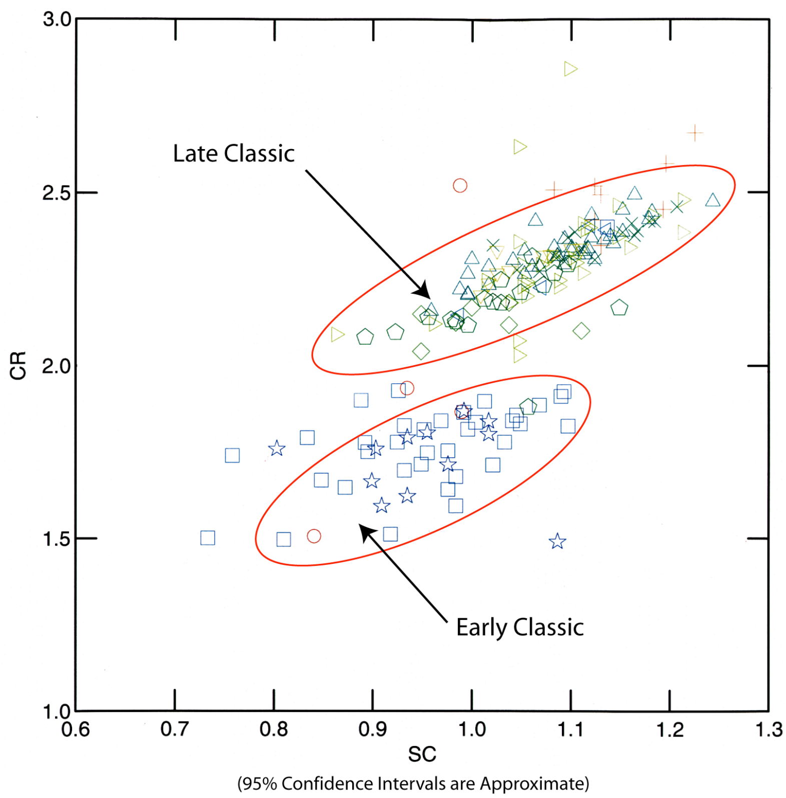

Figure 7.2 Plot Showing Early and Late Classic groups. Within the graph the shapes (triangles, squares, etc.) indicate individual sherds sharing membership in groups linked via hierarchical cluster analysis.

This does not mean that changes in paste recipe or paste preparation did not take place. Rather, it suggests that the changes that took place did not affect paste composition in a manner leaving traces detectable by INAA. Therefore, we should not take the negative INAA evidence as an indication that no changes in paste recipe and, by inference, ceramic production organization occurred. Alternative techniques for measuring changes in paste recipe that are not detected by INAA may indicate that the hypothesized changes in ceramic production organization took place. These as well as other measures of change in attribute diversity that may indicate changes in production organization are discussed in the following section.

Diversity Analyses: Methods, Data and Results

Instrumental Neutron Activation Analysis provides only one method for examining changes in the production organization of resist decorated ceramics. Following the hypotheses presented above, we can also examine this issue from the perspective of change in the degree of diversity demonstrated in specific variables. Metric standardization is often relied on as a measure of increasingly intense ceramic production, where concerns of transportability, durability, and consumer expectation become dominant issues in determine the organization of ceramic production. For example, as production moves from occasional production for household consumption to part- or full-time specialization for the production of market goods.

However, the lack of whole vessels in the Piedras Negras ceramic collection make a study of metric standardization difficult. While it is possible to measure vessel diameter from rim sherds if they represent a significant proportion of the complete rim, this was not the case with a large part of the Piedras Negras assemblage where the majority of measured rim sherds represented less than 12 percent of the vessel diameter. Additionally, the diameter chart utilized in this research was accurate only to ± 5 mm. While this is sufficient for characterizing mean vessel diameters in typological studies, it is not sufficiently accurate for measures of metric standardization.

Because measures of metric standardization are not applicable to the current study given the limitations of the sample, the best measures of change in production organization for the Piedras Negras resist and resist-reserve decorated ceramics may be measures of non-metric attributes, including the organization and thematic content of exterior and interior decoration, paste color and temper combinations (these may serve as a measure of clay source, paste recipe, and vessel firing techniques), and changes in the diversity of vessel forms produced.

Diversity Analyses: Sample Selection

Unlike the INAA analyses, where cost and other factors necessitated the selection of a small but representative sample from all of the available sherds, the selection of sherds for inclusion in the analysis of decorative, formal, and paste color/temper combinations was not subject to the same limitations as the INAA sample and was, as a result, far larger. Included in this analysis are data from nearly every analyzed polychrome sherd drawn from unmixed lots that could be confidently assigned to Balche, Early or Late Facet Yaxche and Early Facet Chacalhaaz. Despite this specificity, over 600 sherds were considered in the analysis (Table 7.3).

Table 7.3. Sampling by Time Period and Decorative Technique.

Period	**Resist**	**Resist-Reserve**	**Total**
Balche	72	35	**107**
Early Yaxche	108	12	**120**
Late Yaxche	216	148	**364**
Early Chacalhaaz	32	28	**60**
Late Chacalhaaz	12	27	**39**
Totals	**440**	**250**	**690**

It is important to note that this sample is a subset of a far larger set of data. To reiterate, sherds were selected only from lots that could be confidently assigned to Early or Late Facet Yaxche or Early Facet Chacalhaaz. Sample selection was made in this manner to increase the resolution of the analysis. By only using ceramics from unmixed and Early and Late Facet Yaxche and Early Chacalhaaz lots, it was possible to track changes in the selected variables over intervals of approximately 50 years. Had all resists and resist-reserves from unmixed lots been considered, the sample would have totaled well over 1,000 sherds, but the resolution of the study would have been limited to changes happening across periods of approximately 100 years.

Though limited by the need to select sherds from narrowly defined chronological contexts, the sample was drawn from a large number of contexts representing all parts of the site and all levels of settlement. A total of 36 excavation operations or approximately 60 percent of all the excavation operations at Piedras Negras are represented by the sample. It is important to note, however, that much of the resist and resist-reserve decorated sherds from the peripheral excavations at Piedras Negras were too eroded to consider in this analysis. In addition to the poor preservation of the resist and resist-reserve decorated ceramics, it was difficult if not impossible to determine chronological placement at the level necessary for this analysis. As a result, all of the resist and resist-reserve decorated ceramics from the peripheral excavations were omitted from this analysis. Finally, for this analysis all resists were considered together. No effort was made to track changes in decorative, formal, or other changes within specific resist or resist-reserve types or varieties. This was done because the present was concerned with changes in the overall production organization of resist and resist-reserve decorated ceramics, not with changes in the production organization of specific types, though this remains a viable program of analysis.

Diversity Analysis: Results

An analysis of the attribute data collected during the sherd-by-sherd analysis of the Piedras Negras ceramics was undertaken to address the question of whether there were statistically significant changes in the diversity of specific categories over time that might indicate changes in production organization. Despite the complexity of the data set (see Appendix D), the analysis of the data proved to be relatively direct. The raw data consisted of a series of alphanumeric codes recording details on 35 aspects of decoration, form, and paste by sherd and phase. Given the large number of variables, the first step of analysis was to select the most relevant variables. Nine variables were selected for analysis. These included:

1. Vessel Form
2. Paste Color/Temper
3. Interior/Exterior Decoration
4. Distribution of Interior Decoration
5. Location of Interior Decoration
6. Principal Theme of Interior Decoration
7. Distribution of Exterior Decoration
8. Location of Exterior Decoration
9. Principal Theme of Exterior Decoration

Information on these categories can be found in Appendix D, a listing of the codes used for recording the data collected for each category. Paste Color/Temper, however, requires some additional explanation in addition to what can be found Appendix D. Paste

Color/Temper is a composite category created by combining the Munsell color name with the measure of fine and coarse temper densities. Fine and coarse temper densities were determined by comparing the sherd cross section with a standardized chart showing particle size and percentages by area. Paste colors were initially recorded as Munsell color codes, e.g. 5YR 4/3. These codes were converted to their Munsell color names to reduce some of the variability in the sample and to moderate the effects of bias introduced by multiple analysts and changing light conditions. For example, the use of the color name Reddish Brown describes four similar Munsell colors 5YR 5/3, 5/4, 4/4 and 4/3. All four codes were recorded as Reddish Brown in the modified data set. During the initial analysis, information on each sherd was recorded with a series of alphanumeric codes denoting specific attributes within a single category. It was necessary to convert this sherd-by-sherd descriptive data into counts of specific attributes by phase and decorative mode. An example of the tabulated data is presented in Table 7.4.

Because the data were categorical, the kinds of statistical tests available for measuring changes in diversity was limited to tests of association such as Chi-Square or Eta/Eta-Squared. However, given the questions asked of the data, neither of these tests was entirely appropriate. Chi-square, for example, would only allow us to determine whether there was a statistically significant relationship between the categorical variables. Chi-squared might be applied to determine whether a statistically significant difference existed between ceramic phases and *frequencies* of specific vessel forms. A Chi-square test could not determine, however, whether or not there were statistically significant changes in the *number* of vessel forms represented between ceramic phases.

Table 7.4 An Example of the tabulated data. The codes in the "Form" column correspond to codes listed under the "Form" heading in the coding key included as Appendix D.

		Decoration			
Phase	**Form**	**Positive**	**Resist**	**Resist-Reserve**	**Total**
Balche	0	3	0	0	3
	1.1	12	0	1	13
		1	0	2	3
	2.1	1	1	3	5
	2.11	1	5	3	9
	2.2	5	0	0	5
	2.3	0	6	1	7
	2.4	0	0	5	5
	2.8	0	8	6	14
	3	1	3	3	7
	3.1	0	1	0	1
	3.2	0	2	1	3
	3.4	0	0	4	4
	3.8	6	0	0	6
	4	8	1	2	11
	4.1	7	2	12	21
	4.2	1	0	1	2
	4.3	1	3	2	6
	4.5	1	0	4	5
	4.7	2	2	1	5
	4.8	4	0	2	6
	4.9	1	1	0	2
	5	0	5	2	7
	5.6	0	0	1	1
	7	5	1	0	6
Total		**60**	**41**	**56**	**157**

Eta/Eta-squared is a measure of association appropriate for a dependent variable measured on an interval scale, such as ceramic phase, and an independent variable with a limited number of categories, such as vessel form. In general terms, Eta is similar to an ANOVA, in that it compares differences in frequencies (rather than mean scores) of specific categories to determine if a statistically significant difference exists between dependent variables. Eta-squared is a measure of the percentage of variability in the dependent variable accounted for by the independent variable. These tests, however, are not appropriate when the number and categories represented by the independent variable change between intervals.

Given the questions asked, the limitations imposed by the use of categorical data, and the differences in sample size, the most appropriate analysis involved expressing the variation within a single variable by ceramic phase as a percentage of the total variation found within that category. For example, Table 7.5 lists the number of vessel forms used in the production of resist/resist-reserve decorated ceramics phases. The number of vessel forms used in each time period was divided by this number to arrive at a percentage expressing the amount of variation in vessel forms between time periods, controlling for decorative mode. For example, the highlighted cell indicates that 29.73 percent of all the variation in vessel form in resist decorated ceramics occurred during early Yaxche. The variation in the succeeding time period accounted for a larger percentage of the total variation in vessel forms, indicating that a wider variety of vessel forms were in use during the later period.

Table 7.5 Tabulation of Variation in Vessel Form by Time Period and Decorative Mode

<table>
<tr><td colspan="2" rowspan="2">Total Number Vessel Forms Used</td><td>Resist</td><td>Resist-Reserve</td></tr>
<tr><td>37</td><td>38</td></tr>
<tr><td>%/Period</td><td>Balche</td><td>0.3243</td><td rowspan="2">.4333</td></tr>
<tr><td></td><td>Early Yaxche</td><td>0.2973</td></tr>
<tr><td></td><td>Late Yaxche</td><td>0.3353</td><td>0.2773</td></tr>
<tr><td></td><td>Chacalhaaz</td><td>0.0431</td><td>0.2894</td></tr>
</table>

These results do not require further statistical analysis, In examining resist data from Table 7.5, it is clear that there is a slight reduction in vessel forms utilized from Balche to early Yaxche in the production of resist decorated ceramics. However, there is an increase in the number of vessel forms used in the production of resist decorated ceramics during the late Yaxche ceramic phase. By the Chacalhaaz period, only a few resist ceramics are being produced; resist-reserve ceramics are more common. This procedure was repeated for all nine variables (Table 7.6).[11]

For resist decorated ceramics, three of the remaining eight variables follow a similar trajectory. There is a clear increase in the number of specific decorative motifs used to decorate vessel interiors and exteriors and in the number of paste color/temper combinations. Three variables, Distribution of Exterior Decoration, Location of Exterior Decoration, and Interior/Exterior Decoration show slight decreases through time, while a fourth, Distribution of Interior Decoration, does not change at all. Finally, a single variable, Location of Interior Decoration, does not appear to change in a patterned way.

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[11] Pearson's-R, a non-parametric measure of correlation between nominal variables, could be used to assess the strength of the relationship between the dependent and independent variable. Doing so, however, would require eliminating the Chacalhaaz phase from consideration because resist decorated ceramics are so poorly represented during this time period.

Table 7.6 Tabulated Percentages of Variation by Phase and Decorative Mode

Specific Exterior Theme

	Resist	Resist-Reserve[12]
Bache	0.1364	0.1200
E. Yaxche	0.4091	0.0000
L. Yaxche	0.4411	0.6400
Chacalhaaz	0.0134	0.2400

Specific Interior Theme

	Resist	Resist-Reserve
Balche	0.1064	0.0952
E. Yaxche	0.2340	0.0000
L. Yaxche	0.5865	0.7143
Chacalhaaz	0.0731	0.1900

Distribution of Exterior Decoration

	Resist	Resist-Reserve
Bache	0.3636	0.2778
early Yaxche	0.3636	0.0000
late Yaxche	0.2367	0.2778
Chacalhaaz	0.0361	0.4444

Distribution of Interior Decoration

	Resist	Resist-Reserve
Bache	0.3333	0.2143
early Yaxche	0.3333	0.0000
late Yaxche	0.3333	0.2857
Chacalhaaz	0.0000	0.5000

Location of Exterior Decoration

	Resist	Resist-Reserve
Bache	0.4210	0.2400
early Yaxche	0.2914	0.0000
late Yaxche	0.2632	0.2800
Chacalhaaz	0.0344	0.4800

Location of Interior Decoration

	Resist	Resist-Reserve
Bache	0.3158	0.2632
early Yaxche	0.3252	0.0000
late Yaxche	0.3158	0.2632
Chacalhaaz	0.0432	0.3684

Interior/Exterior Decoration

	Resist	Resist-Reserve
Bache	0.4138	0.2727
early Yaxche	0.3309	0.0000
late Yaxche	0.1724	0.3183
Chacalhaaz	0.0923	0.4090

Paste Color/Temper

	Resist	Resist-Reserve
Bache	0.2429	0.2188
early Yaxche	0.3051	0.0000
late Yaxche	0.4203	0.5703
Chacalhaaz	0.0317	0.2109

[12] There are no resist-reserve ceramics in the early Yaxche ceramic sample. It is possible that this technique was abandoned for a short time in the Late Classic in favor of resist-only decorated ceramics. The resist-reserves of the Balche ceramic phase belong to a single type, Mataculebra Cream Polychrome that is technologically similar to later polychromes but is distinct typologically. Therefore, in examining the resist-reserve data, it is important to focus only on changes occurring in the Yaxche and Chacalhaaz phases.

Diversity Analyses: Discussion

For resist-reserve decorated pottery, four variables Vessel Form, Specific Interior Theme, Specific Exterior Theme, and Paste Color/Temper show decreases in variability through time. The remaining five variables, Distribution and Location of Exterior Decoration, Distribution and Location of Interior Decoration, and Interior/Exterior Decoration all show increasing variability between the Late Yaxche and Chacalhaaz periods. With regard to the resist decorated ceramics, it seems clear that the changes in production following the initial appearance of this ware resulted from an increased number of potters producing resist decorated vessels. Exterior and interior decorative motifs and paste/temper combinations become more variable late in the ceramic sequence. At the same time, there is reduction in the variability of the distribution and location of exterior design. This suggests increasing standardization in the placement of exterior decoration matched by an overall increase in the number of themes incorporated into the decoration. This is visible in the ceramics principally as an increase in the number of geometric motifs combined to produce exterior and interior decorations, though a few other non-geometric motifs are introduced as well. Finally, the increase in the decorative variability is matched by an increase in the variability of the vessel forms being produced. The precipitous drop in the variability of all measures during Chacalhaaz is attributable to the near-complete abandonment of resist decoration in favor of resist-reserve and positive painting.

The evidence regarding the resist-reserve decorated ceramics is more ambiguous. Rather than a reduction in variability indicative of, perhaps, increasing standardization in production, variability in most measures, particularly in the manner in which decorations are distributed across vessel interiors and exteriors, increases through time. Interestingly, there is a matching *reduction* in the total number of decorative themes applied. This is the opposite of what occurs in the resist decorated ceramics. The overall picture is one in which fewer and fewer themes are being used to decorate resist-reserve ceramics, but these are being placed in increasingly diverse locations on vessel interior and exteriors.

Overall, the hypotheses regarding the changing organization of ceramic production at Piedras Negras is supported, albeit weakly. While there is some evidence for decreasing variability in some aspects of vessel production, these changes do not occur across variables where linkages were expected, or even within the same variable when comparing resist and resist-reserve ceramics. The latter differences may be the result of the different technologies used in the manufacture of these wares as well as differences resulting from the origins of these technologies.

If resist and resist-reserve ceramics are considered together, the measures of variability become very nearly random - there is *no* indication of directional change in any of the variables selected for analysis. This suggests that the production organization for these two wares was not identical when considering a single time period. This result makes sense considering the initial hypotheses. Resist technology arose *de novo* at Piedras Negras and, early in its history, was manufactured by relatively few potters at the site. Resist-reserve, in contrast, was developed out of resist technology and drew on already established practices. Furthermore, even in its earliest stages of development, resist-reserve was likely the product of more potters than resist decorated ceramics at a similar point in its developmental trajectory. Therefore, we should not expect to see identical developmental changes along any of the measured parameters when considering these wares separately.

Conclusion

The data presented in this chapter has provided some evidence regarding changing production organization for resist and resist-reserve decorated ceramics. The modal data indicate decreasing diversity in certain aspects of vessel design. However, these changes are not consistent across all relevant variables, and some ambiguity in the interpretation of the data exists. Neither the modal nor the INAA data provide direct evidence for the kinds of changes in the organization of production hypothesized to have occurred.

The model of ceramic change presented here, built primarily from epigraphic and ethnohistoric data from the Maya Lowlands, fits well with the distribution of resist and resist-reserve ceramic observed archaeologically. While the modal data provide some support for changing production organization, it does not provide evidence bearing directly on the origins of resist and resist-reserve decorated ceramics. It simply indicates that some changes in the production organization of these wares occurred and that these changes were not necessarily coincident, either across time or across comparable variables. The INAA data, though indicative of some changes in paste recipe/paste composition coincident with the Early/Late Classic break at Piedras Negras, did not indicate any compositional patterning indicative of the hypothesized changes in the organization of production of resist and resist-reserve ceramics. Given the results of the analyses presented here the strongest evidence for the model of ceramic change offered in this dissertation remains the archaeological data regarding the distribution of resist and resist-reserve decorated ceramics at Piedras Negras.

Chapter 8

SUMMARY AND CONCLUSION

> …crossing both sets of structuralists are the vast army of reductionists, those who search for the really real in Anthropologyland. Pigs are not to think, or even to constitute relationships with; they are protein. Marriage and the family are really about biology and the production of enough bodies to fill the circles and squares of the anthropologist's genealogical charts…To the reductionists, ideology and culture are mystifications or expressions of false consciousness, or they are the working out of predetermined needs, or *post hoc* rationalizations growing out of the actual behavior of the actors. [Cohen 1987:21]

Beginning in about A.D. 550, the ceramics of Piedras Negras underwent a sustained period of rapid and profound change. These changes were primarily decorative in nature and culminated in the development of an elaborate resist and resist-reserve technique. This distinctive decorative technology dominated the Piedras Negras polychrome assemblage for almost 200 years, becoming the most common polychrome decorative mode. Though resist and resist-reserve decoration is known at a few other Maya sites, nowhere did it become as common or as elaborated as at Piedras Negras. Far more than the elaboration of extant decorative techniques, the development of resist and resist-reserve decoration was an innovation requiring fundamentally altered technological practices. Understanding how and why this change may have come about\ and the social and historical forces underpinning this change were the principle foci of this dissertation.

While the developmental trajectory observed for the ceramics at Piedras Negras may have been unique in it details, it was part of a much larger pattern - numerous authors have noted the increasing regionalization of Late Classic polychromes (Ball

1977; Fry 1969; Reents 1983; Smith and Gifford 1965; Rice 1987a). Some have attempted to tie this development to changes in the organization of ceramic production (e.g. Fry 1969; Rice 1987a), but none have adequately addressed the question of why or how changes in production organization may have contributed to the development of a distinct a ceramic style. The decision on the part of the Piedras Negras population to adopt a novel and highly visible ceramic style, and the resultant developmental trajectory of this style, provides an excellent opportunity to examine this issue.

Additionally, the nature of the ceramic changes at Piedras Negras provides an opportunity to examine the processes of technological change in pre-modern societies. More specifically, how which the development of regionally specific ceramic styles bear on the relationship between technological innovation, crafting, the possession of cultural goods and processes of political legitimation. The distinctive nature of the Late Classic polychromes, the exceptional epigraphic record available for Piedras Negras, and the large and well provenienced sample resulting from the recent excavation make the site an excellent case study for this subject.

Approaching these issues requires the selection of an appropriately broad theoretical frame in which to analyze and interpret the available data. The Classic period Maya were a complex society who left behind a rich body of iconographic and historical information. This information is complemented by the large body of ethnohistoric, ethnographic, and comparative data available from the modern descendents of the ancient Maya as well as from societies elsewhere in the world. An appropriate body of theory is one that can integrate this data into a narrative framework - one that is at once historical as well as rooted in larger sociocultural processes. While it is possible to interpret the ceramic change at Piedras Negras as a purely *archaeological* process, doing so ignores much of the available data, reducing the material culture changes evident at Piedras Negras, of which the ceramics were only a part, to a curiosity disconnected from the larger social, political, and historical currents in which they were embedded. An appropriate body of theory must, therefore, admit as much of this data as possible while providing an explanation for change that does not necessarily hinge on the details of the specific case.

SUMMARY

The following section summarizes the arguments regarding the causes for the ceramic changes occurring at Piedras Negras between about A.D. 550 and A.D. 700. In general this summary follows the structure of the dissertation, though the sections on the historical and social contexts of ceramic change have been combined.

Three Models for Artifact Change

This dissertation began with a discussion of three general theoretical paradigms, Evolutionary Archaeology, Evolutionary Ecology, and Social Constructionism, commonly employed by archaeologists in interpreting material culture change. The goal of this section was not to point out the futility of any single paradigm in explaining change in the archaeological record but rather to point out differences and similarities between the three approaches, ultimately arriving at an approach satisfying the necessities of the Piedras Negras case and providing an explanation for change generalizable to cases elsewhere.

Evolutionary Archaeology focuses almost exclusively on artifacts as past adaptations to environmental or ecological conditions serving to enhance reproductive success. Artifacts or technologies change as the result of natural selection acting on adaptively random cultural variation, while artifact frequencies change as a result of the differential reproductive success of the artifact or technologies of their users. As in biological evolution, the emphasis is placed on gradual descent with modification, stressing the “genetic” relatedness of artifact forms. A key element of Selectionists’ explanations is the construction of artifact genealogies wherein the gradual changes that occurring in artifact design can be traced over long periods of time.

Given this, Evolutionary Archaeology’s strength lies in explaining changes that occurred over hundreds or thousands of years and that involve the gradual modification of extant artifact forms. Transformational changes in the archaeological record - that is, changes in artifact forms or assemblages occurring rapidly over the course of a few generations and with few or no antecedents - are not amenable to examination under this model. This does not mean that these changes are not subject to empirical archaeological analysis. It does suggest, however, that these kinds of changes require an alternative approach better suited to understanding rapid shifts in material culture. Evolutionary Ecology may provide such an avenue.

Evolutionary Ecology approaches changes in human behavior and cultural systems from a perspective similar to Evolutionary Archaeology, with one critical difference. Rather than emphasizing gradualist descent with modification in artifact forms and, by inference, their behavioral or cultural bases, Evolutionary Ecologists emphasize the evolved capacity of organisms to make evolutionarily adaptive choices to cope with immediate environmental or ecological stresses. Behavioral choices are framed in terms of optimality models, with fitness conferred on those organisms making the most efficient use of available resources. There is no appeal to genetic evolution or condition requiring “genetic” relatedness between temporally linked behaviors. The result is that explanations in Evolutionary Archaeology can accommodate changes in behavior that happen more quickly and in response to a wider variety of factors than do explanations relying on Darwinian processes.

There is no requirement with Evolutionary Ecology that behavioral choices be perfectly optimal. Behavioral choices and in the case of human societies their material correlates, are constrained by demands or limitations in other realms. These demands include environmental constraints such as raw material availability, the recursive effects of other organisms or social entities on the range of available choices, and prior behavioral or strategic decisions. Given this, behavioral changes, whether in animal population or human societies, cannot be assumed to result from natural selection acting on culturally transmitted variation. Rather, behavioral strategies are structured by prior behavioral states that are the result of even earlier states. While Evolutionary Ecology admits the possibility that factors other than mechanical efficiency influence the direction of technological or material culture change, there is no satisfactory means for dealing with these factors or for understanding how they may affect the direction of change. It is these factors that are the subject of constructionist approaches.

A general criticism leveled at both Selectionist and Ecological approaches is their inability to adequately deal with change in complex societies.[13] In many cases, evolutionary or ecological explanations are unnecessarily reductionist, eliminating from consideration much of the data making complex societies like the ancient Maya so fascinating and limiting their relevance for understanding larger social processes. Constructionist approaches avoid this criticism by incorporating as much archaeological, historic, ethnohistoric, and ethnographic data as possible into explanatory narratives. Unfortunately, this drive often results in particularistic accounts that do little to place the case at hand into a more general framework.

The constructionist approach described in this dissertation attempts to circumvent this shortcoming, integrating as much ethnographic, ethnohistoric, and archaeological data as possible with a broader body of ecological and sociological thought. This approach places coevolution, competition for limited resources, and the recursive effects of phenotype on ecological conditions on new phenotypic variations in a practice-oriented framework. This approach stresses the culturally competent manufacture and use of cultural goods in political competitions at a variety of scales. Though the approach presented here is broadly ecological, the emphasis is on the impact of short-term decision making on social reproduction and material culture, not on biological reproduction or the unidirectional replication of utilitarian artifact forms.

The central metaphor of this model is that of the symmetric Red Queen race - a competition for access to limited resources in which the contestants are constantly

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[13] It is important to note that while I believe this to be generally true, I can think of at least one example where an ecological approach has provided a deeply satisfying explanation for the evolution of a specific material system - Balinese rice agricultural (Lansing 1991).

escalating the means of competition in reaction to the activities and practices of their nearest competitors.[14] Factions, classes, or similar social entitles are the participants in these kinds of contests and cultural goods are the medium of competition. These contests are played for definitions of status, class, and identity, and the outcomes manifested as the reproduction of social and political structures. One result of these contests is the creation of specific cultural goods that may transmit individual and group identity, and foster social reproduction.

The competent manufacture and use of cultural goods is defined by socially negotiated sets of material practices. Practices, as fields of action defining dispositions and perception, take the form of practical knowledge and may become expressions of individual and group identity. Practices may result from negotiations between individuals and groups as they strive to express political and social ideals. These negotiations involve and affect social forms that ultimately find expression through practices. This process of negotiation and the attendant co-opting of values and ideas is an eminently political process, one that takes place every day and in a variety of material forms, from the mundane to the extraordinary.

The Historical and Social Context of Ceramic Change at Piedras Negras

The specific historical factors affecting Piedras Negras at the beginning of the Late Classic period, as well as the more general context of elite craft production are the context for the ceramic changes affecting Piedras Negras at the beginning of the seventh

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[14] Asymmetric competitions are commonly associated with predator-prey relationships, or wuth what Dawkins and Krebs (1979:491) term, "attack-defence arms race."

century A.D., as well as other marked changes in material culture that took place at the site. These changes included shifts in the theme and content of monumental art and the location and construction of monumental art. While it is possible to study these changes in isolation, doing so unnecessarily limits isolates one aspect of material culture from another. Given the nature and timing of these changes, it seems most likely that these material shifts were initially part of a larger, though not necessarily unified, strategy on the part of the site's elite to reorient and stabilize political relationships as Piedras Negras emerged from the traumas of the Early Classic.

Though the reproduction of elite architectural forms may have been beyond the purview of the largest part of the public, the replication of the ceramic technologies that may have originally been developed for elite use as expressions of status and class was not. Resist and resist-reserve decorative technologies developed concurrently with the changes in the monumental art and architecture at Piedras Negras and similarly may served as a means for the Piedras Negras elite to express the differences between themselves and between themselves and the larger part of the population. The decorative technologies may have first been deployed on vessels intended exclusively for elite consumption, perhaps in competitive displays, and later reached other, less elite segments of society.

Historical Context of Ceramic Change

In general, the material changes visible at Piedras Negras were part of a much larger shift affecting sites across the Peten, and the changes potentially related to the withdrawal of Teotihuacán from the Central Maya Lowlands. The withdrawal of Teotihuacán likely disrupted political relationships throughout the Peten, including the Usumacinta Basin, and provided substantial opportunity for political maneuvering. In addition, the Teotihuacáno presence in the Maya Lowlands provided a rich body of iconography and mythological associations that would later be incorporated into Maya ideology.

More specifically, the ceramic and other material culture changes occurring at Piedras Negras at the beginning of the Late Classic were situated in a historical context that begins with the emergence of Piedras Negras from a long period in the late Early Classic during which it may have been politically subservient to a site elsewhere in the Usumacinta Basin, possibly Pomona. This period of subservience or, at the very least, severely reduced political potency was marked at Piedras Negras by a series of architectural destructions, including the razing of the Early Classic palace and the destruction of numerous Early Classic monuments, several of which were found shattered and reused in Late Classic structures. The pattern of architectural terminations as well as the destruction of Early Classic monuments suggest an attempt by the rulers of Piedras Negras to eliminate history and eradicate memories of past political trauma in an attempt to reestablish royal legitimacy during the Late Classic.

The rulers of Piedras Negras marked their Late Classic return to political preeminence by engaging in a protracted program of revitalization, gradually shifting the locus of the royal authority from the South Group Court, where it had resided for several centuries, to the Acropolis, a collection of palaces, sweat baths, and temples located on a hill overlooking the site. Other construction projects beginning at about this time included the expansion of the West Group Court and the initial construction of pyramidal

Str. K-5. Interestingly, the construction on the Acropolis and West Group Court contained several architectural references to Central Mexico, including the use of Mexican year signs executed in plaster to decorate the façade of Str. K-2 at the entrance to the Acropolis, and the use of trapezoidal hill signs on the base of Str. J-4. It is reasonable to read these architectural elements as signs of disconnection and an attempt to create a new political identity, signaling to the larger part of the Piedras Negras population that the Acropolis, the seat of royal power, was somehow outside of Piedras Negras and that the rulers were ontologically distinct from their subjects.

This same strategy of disconnection is evident in the Late Classic monuments of Piedras Negras, particularly in the so-called warrior stelae. The warrior stela depict the Late Classic rulers of Piedras Negras wearing costumes laden with Teotihuacáno iconography and clutching a square, fringed shield of the kind often associated with Teotihuacán at sites elsewhere in the Peten. Stone (1989) argues that these stelae exemplify strategies of disconnection, attempts to emphasize a rulers difference from his subjects. While it is possible that there was something inherent in government as exercised at Teotihuacán that made it an ideal source for a ruling ideology, it seems more likely that Teotihuacáns' status as a distant and largely mythical location made it an ideal source for a legitimating ideology.

The changes in monumental art and architecture at Piedras Negras occurring at the beginning of the Early Classic were only the most visible efforts of the Piedras Negras nobility to stabilize and reorient political relationships following the political traumas of the late fifth century A.D. The new monumental programs were intended to evoke an imagined and distant past, emphasizing the ontological difference between the ruler and the ruled and reinforcing the legitimacy of the political order. As a system of *practices*, rulership at Piedras Negras was more than an instrument of domination, it was an active accommodation of numerous, disparate ideals into a novel cultural form, requiring constant renegotiation in response to changing political and social conditions.

Social Context of Ceramic Change

The changes in the monumental art and architecture of Piedras Negras that occurred during the period A.D. 550-680 were a result of an elite need for unique material expressions. These efforts were undertaken to stabilize political relationships disrupted by the sociopolitical events affecting Piedras Negras and the Maya Lowlands at the end of the sixth century A.D.. The Late Classic ceramic diversification evident at Piedras Negras and across the Maya Lowlands filled this same need for unique material expressions and resulted from general conditions structuring ceramic production, the link between crafting, the possession of cultural goods, and political legitimation.

The term “elite” is best defined as a culturally and historically constructed identity occupying a particular social space defined by economic, social, and cultural capital. Cultural capital refers to the corpus of knowledge necessary for the culturally competent definition, production and consumption of cultural goods. As such, it is an indivisible component of High Culture, a value-laden stylistic complex, manifested through the production and consumption of aesthetic items, or cultural goods. Cultural goods, as a more general class of material culture, communicate socially significant messages and reinforce social boundaries.

The consumption of cultural goods is predisposed to legitimate social differences and it is within this that the competition between and among individuals and corporate groups to differentiate themselves from one another can be observed. It is important to note that the utility of cultural goods is not absolute, and their status is constantly in the process of negotiation as items are co-opted, discarded, or revived in a constant effort to produce novel symbols of exclusivity. It is the nature of these efforts, their constancy and their structure, that suggest the utility of the Red Queen metaphor for understanding this process.

In some societies, patron-client relationships may be formed whose function is the production of high cultural goods for use in competitive displays or other status-enhancing venues. The creation of cultural goods results from an association between talented artisans and the supernatural and the products of talented artisans may be perceived to have some connection with the supernatural making them effective political symbols. By participating in craft production or sponsoring craft specialists, elites assert control over these political and supernatural symbols, providing proof of their own exalted status, and controlling the definition, production and consumption of cultural goods.

Among the Classic Maya, as well as their historic descendents, there is a clear association between crafting, supernatural sanction, and political legitimacy. There is abundant archaeological and epigraphic evidence for elite craft production, especially the production of the finely painted polychrome vessels so commonly associated with the Classic Maya royal culture. It is clear that the production of at least some of these polychromes took place within royal compounds or palaces of some sites, that the producers of these polychromes were themselves elites, and that the primary consumers of these vessels were also members of the elite.

Though we lack the epigraphic and archaeological data to identify elite craft production at Piedras Negras, the data drawn from elsewhere in the Maya area and from both Classic and Postlassic contexts overwhelmingly supports the proposition that at least some of the pottery found at Piedras Negras was produced by client artisans whose products were intended for use by the most elite members of Piedras Negras society. If this was the case, then the context of their production suggests that at least some of these vessels, because of the rarity and provenance, carried with them the inalienable properties marking them as high cultural goods and ensuring their relevance in defining the social and political identities of their owners. Furthermore, their status as products of high culture ensured their desirability and the continuing escalation of the material contest of which they were a part.

Ceramic Changes A.D. 550-750

The appearance of resist and resist-reserve decorated pottery that is the focus of this dissertation was only one of a series of shifts affecting the pottery of Piedras Negras between A.D. 550 and A.D. 700. Two of these decorative shifts, smudge resist decoration and specular hematite decoration, followed a similar developmental trajectory as resist decoration, but did not come to dominate the polychrome assemblage of the site in the same way as resist and resist-reserve decoration. These two examples were important because they point to a repetitive pattern at Piedras Negras of which the appearance and distribution of resist decoration was only the most obvious example. This involved the creation of unique ceramics for the site's most elite residents for use in public displays of status and wealth. Through time, these ceramics initially produced for the sites most elite were replicated and became widely distributed, losing in the process their identity as exclusively elite possessions, though perhaps never becoming entirely divorced from their elite associations. The result was the creation of a regional ceramic style that ultimately served to distinguish the pottery of Piedras Negras from the polychrome pottery found elsewhere in the Peten. Though similar ceramics are known from elsewhere in the Maya Lowlands, nowhere else were they as common or as elaborated.

The fact that the appearance and distribution of resist and resist-reserve decorated ceramics followed a similar trajectory as other pottery styles at Piedras Negras suggests that ceramics were one of the principal means by which the elites of the site expressed their status and were, as a result, one of the principal foci for non-elite expression, celebration, and contestation of elite ideals. Other expressions of elite status - monuments, architecture, and exotic goods - because of the esoteric knowledge involved in their production, or because of the expense of acquisition, were beyond the ability of the larger part of the population to acquire. In contrast, ceramics, because they are highly visible and because they can be manufactured from pedestrian materials, are easily replicated and integrated into the everyday lives of the populuce. This fact necessitated the constantly escalating search for novel material expressions of status.

This model for the origin and spread of resist and resist-reserve decorated ceramics, and the organization of ceramic production suggested by the archaeological and ethnohistoric data from elsewhere in the Maya Lowlands leads to several testable hypotheses that can be assessed through measures of standardization, including paste recipe and decorative diversity. The earliest iterations of resists and resist-reserve pottery may have been produced by artisans who may themselves have been members of the elite and who potted exclusively, or nearly so, for other the elite. This pottery may have been used in competitive displays intended to advance personal standing and prestige. Later, this pottery style was replicated and produced by non-elite potters working across the site. If this is the case, then we might expect to see differences in paste recipe and decorative diversity. Pottery made by fewer potters is expected to show less variability in paste recipe and more decorative variability, while the ceramics manufactured later should show greater overall diversity in paste recipe and less decorative diversity.

Instrumental Neutron Activation Analysis and Modal Analysis

The INA analysis of the Piedras Negras ceramics failed to indicate any differences in the paste recipe utilized in the early or late resist and resist-reserve decorated ceramics. Though there does appear to have been a shift in paste composition coincident with the Early/Late Classic break, no significant difference in paste composition could be found in between early and late resist and resist-reserve decorated ceramics. There are numerous reasons why this might be the case, the most likely being the relative homogeneity of the clays in the Piedras Negras region and the lack of distinctive tempers. The lack of compositional differences between resists, resist-reserves and other polychromes and unslipped wares manufactured at Piedras Negras suggest that this may be the case.

The modal analysis provided some results indicating that changes in production organization did occur in the hypothesized direction. These data, though suggestive, are ambiguous and difficult to interpret. Some of this ambiguity may result from the fact that the changes in the production organization of resist and resist-reserve decorated ceramics are not sequent. Rather, resist-reserve ceramics began to be produced concurrently with resist decorated ceramics and, therefore, production organization did not undergo the same transformations. As a result, changes in comparable variables did not necessarily occur in the same direction or with the same magnitude. Combining measures of variation in resist and resist-reserve ceramics resulted in seemingly random change in almost every variable investigated.

Discussion

Given the results of the analyses presented here, the strongest evidence for the model of ceramic change offered in this dissertation remains the archaeological data regarding the distribution of resist and resist-reserve decorated ceramics at Piedras Negras. The model presented here is predicated on the idea that the initial iterations of resist decorated pottery were produced by elite artisans working within conditions of restricted production, producing that because of the status of the artisans and their audience were endowed with certain inalienable qualities that made them particular well suited for use as political currency deployable in social competitions stressing status and prestige. This model, constructed from a large corpus of archaeological, epigraphic, ethnohistoric, and ethnographic data fits the distribution of resist and resist-reserve ceramics observed archaeologically and is a compelling explanation for ceramic change.

It is possible, however, that resist decorated ceramics were not originally produced by embedded elite producers. Rather, non-elite potters working at locations across the site were commissioned to produce pottery for use by the site's most celebrated members. This possibility is suggested by Rowlands (1987) description of non-elite craft producers who were occasionally commissioned by elite consumers to produce specific commodities for use by the site's elite. These commissioned works, because of the status of the consumers, were perceived to be of a higher quality and took on greater social or symbolic meaning. If non-elite artisans were commissioned to make elite pottery and were charged with creating unique wares such as the earliest iterations of resist decorated pottery, the resulting distribution of these wares visible archaeologically would be hardly distinguishable from the distribution resulting from elite production for elite consumption.

In the absence of sumptuary laws restricting the production and distribution of these wares or the technological knowledge necessary for the manufacture of these wares, we might expect to a rapid replication of resist decoration with a near simultaneous expansion in the production of resist-reserve decorated ceramics to meet an expanding consumer demand. Again, the archaeologically visible distribution of resist decorated ceramics suggest that this may be an alternative explanation for the observed distribution and changing frequency of resist and resist-reserve pottery. In fact, the lack of compositionally distinct pastes and the modal data suggests that this may be a reasonable alternative. Unfortunately, the archaeological and ethnohistoric evidence for commissioned ceramic production by non-elite artisans in the Maya area that would support this interpretation is lacking. In contrast, there is abundant evidence for works commissioned artistic production by elite artisans.

Though this model is a reasonable alternative for the invention and distribution of resist decorated ceramics presented in this dissertation, it does not contradict it. Those inalienable qualities of material culture that make them avatars of high culture derived from the status of the producer as well as from the status of the *consumer*. Despite the seemingly pedestrian origins of some goods, consumption by celebrated members of society can result in the transformation of what might otherwise have been defined as a popular commodity into high cultural political currency. Finally, it is important to point out that the transformation can occur even in the absence of commissioned works – the conspicuous consumption of popular goods by elites may be sufficient in and of itself to initiate the transformation.

Finally, the nature of the data from Piedras Negras has forced the examination of the issue of technological change from a top-down perspective. This has necessarily entailed an emphasis on identifiable elite practices and while the largest part of the Piedras Negras population has been homogenized and given little influence on the social, political and material currents affecting the city and polity. In reality, it is unlikely that this was the case. I would like to return to the metaphor of the Red Queen race and an Ecology of Practices. The decision, however arrived at, to replicate and imitate elite pottery forms had a lasting effect on the ceramics of Piedras Negras and influenced the direction of future ceramic change. The decision to replicate and imitate, though done in reaction to elite strategies, forced an escalating competition that expressed through the consumption of cultural goods, goods constantly in the process of redefinition as elite and non-elites alike adjusted their tastes and preferences and altered material practices in reaction to one another. In this sense, material culture is a historical entity, with past conditions and behaviors structuring the range and expression of future material practices, though in an unpredictable way. Paste and present practices recursively effect of future practices on dispositions, effecting on the developmental trajectory of social, political, and cultural conditions. Though less visible, the effects of popular practices may impact high culture as forcefully as high culture impacts popular practices.

CONCLUSION

There is no single approach to the archaeological record or study of artifact change that is superior to all others. The application of appropriate theory to the archaeological record is a matter of finding that body of theory that has the most explanatory power in a given context. In less complex societies, theories heavily dependent on ecological or other external stimuli for explanations of culture change may prove to have more explanatory power than those explanations heavily dependent on social theoretical arguments. The reason for this does not lie in the fact that less complex societies are any less “cultural” than more complex societies or that somehow the culture has less of an effect on the creation of artifacts and artifact styles. Rather, it is that in the case of more complex societies archaeologists have richer body of archaeological, contextual, ethnohistoric, historic, and ethnographic material to interpret and to synthesize into explanatory narratives than do archaeologists working with societies or areas in which the available materials are less rich. It is the nature of the data, rather than personal bias alone, which force to us to increasingly diverse explanations for human behavior.

Newtonian mechanics, sufficient to describe the universe as it was understood in the seventeenth, eighteenth and nineteenth centuries was supplemented by quantum mechanics once physicists began to understand creation's true complexity. It was not that Newtonian mechanics was flawed; rather it was that the problems physicists were addressing were not amenable to Newtonian analysis. Newton's work retained its explanatory power, though its applicability depends on the complexity of the problem under investigation and the nature of the variables under study. Newtonian mechanics is an appropriate explanatory framework for describing the orbital paths of celestial bodies; however it is not an appropriate framework for describing the paths of subatomic particles. The inverse holds true as well. Quantum mechanics, as successful as it is in describing the motion of subatomic particles, the flow of time, and the fabric of reality is not an appropriate means for studying the interaction of celestial bodies, the acceleration of falling objects, or even simple problems of force and weight.

The problems amenable to analysis by Newtonian physics arise, ultimately, from interaction at the nuclear and subatomic levels. Newtonian mechanics provide an explanation for the behavior of objects at a specific scale and level of complexity and quantum mechanics at another. The central focus of Newtonian physics, gravity, results from interactions among subatomic particles described by quantum mechanics. It is therefore better to consider Newtonian and quantum physics as occupying either end of a continuum, rather than being fundamentally unrelated.

The direct application of Darwinian theory to the archaeological record provides a satisfactory means for examining change in less complex societies where the most relevant variables-those accounting for the largest percentage of variation -are easily observed and quantified, and sufficient time for Darwinian processes to operate is available. The study of more complex societies, however, calls for similarly complex theories. With the Maya, for example, we are not limited to a few bare collections of stone tools, animal bones, and domestic debris. Instead we have a rich store of epigraphic, ethnohistoric, and archaeological data on which to build our explanations. The nature and complexity of this data requires that we consider explanations and theoretical modes better capable of incorporating the wide range of available data. Doing so, however, carries the risk of producing explanations that are overly particular and without general applicability.

Though focusing on ceramic change at a single site, this study provides a wider perspective on technological change and the social significance of style as a practice-oriented expression of individual and group status and identity. This theoretical approach suggests a mechanism for stylistic change not based on external processes such as trade, diffusion, warfare, or exogenous environmental influences. Instead, the approach taken is broadly ecological and evolutionary, stressing competition, negotiation, and agentive producers and consumers. The result is a study which is sensitive to Piedras Negras' specific historical context but which has wider applicability.

The data from Piedras Negras provide a means for understanding the causes of ceramic change in terms particular to an individual Maya site and polity embedded in larger anthropological processes with both archaeological and cross-cultural relevance. By taking a practice-orientated perspective on style and technological, emphasizing the role of material culture in communicating identity, and focusing on the production organization of a few classes of pottery, the development of ceramic styles at Piedras Negras and in the Maya Lowlands is framed first as the result of choices made by potters working within specific social and historical circumstances, and second as part of more general evolutionary processes.

In the absence of major techno-functional innovation, the creation of new ceramic styles were primarily artistic expressions that, because of their loci of production, the status of the producers, and the status of the consumers, were imbued with particular symbolic and ideological qualities. The replication and imitation of these ceramics represents the recognition of the pottery's inalienable qualities and the successful creation of new aesthetic canons, indicating a subtle reorganization of definitions of art and expressions of status. This processes is ongoing and represents constant recognition and renegotiation of social and political roles.

Copies and imitations do not lessen the symbolic potency of the original. Rather they partake of that aura, sharing the originals' inalienable properties and playing a role in the naturalization of ideology. The more commonplace and taken for granted an object becomes, the greater its role in legitimating the ideological assumptions embodied in the original (Benjamin 1968; Miller 1982:142). This process of recognition and imitation observed in distribution of ceramics from Piedras Negras served a dual purpose - at once celebrating and legitimizing elite culture while at the same time subverting and blurring status distinctions. It is in this way that we can frame stylistic change as a product of ideology, social negotiation, and resistance.

There is no single meaning inherent in material culture, but rather a range of meanings produced by social action throughout the life of an object (Kopytoff 1985). This ambiguity means that there is no single way to make anything, but rather a range of culturally acceptable forms. This range is often understood by archaeologists to constitute "style." Stylistic change is not simply an outcome of random processes. It is the results of decisions made by the artisan working within a specific historical framework. These decisions are based upon a range of culturally acceptable choices determined by the anticipated consumption of the object in a way that is both socially meaningful and historically specific, as well as for reasons of personal aesthetic and mechanical functionality.

Piedras Negras provides an excellent case for examining these processes. Piedras Negras was not the sole Classic Maya site experiencing social upheaval during the late sixth century A.D., but in adjusting to changing conditions, the Piedras Negras rulers and their subjects manipulated a social situation that was both part of a regional system and historically specific. These manipulations of the immaterial social realm left a significant material signature on, among other categories of artifacts, changing pottery styles. Resist decorated pottery emerged and reached its apex in a historical context that allowed for the manipulation of ceramic styles and the consumption of these ceramics in competitive displays, as part of a suite of practices intended to advance the social status of individuals. It is unlikely that ceramics were the only materials in which this competition was expressed; they were perhaps only the most durable.

APPENDIX A: EXCAVATION AT PIEDRAS NEGRAS 1930-1939

Str.	Function	Type of Excavation
Str. E-1	Residence	Clearing
Str. E-2	Residence	Clearing
Str. J-1	Platform	Controlled Fill
Str. J-10	Palace	Controlled Fill
Str. J-11	Palace	Controlled Fill
Str. J-12	Palace	Controlled Fill
Str. J-13	Palace	Controlled Fill
Str. J-17	Palace	Clearing
Str. J-18	Palace	Controlled Fill
Str. J-2	Palace	To Bedrock
Str. J-21	Palace	Clearing
Str. J-22	Palace	Controlled Fill
Str. J-23	Palace	Controlled Fill
Str. J-28	Palace	Clearing
Str. J-29	Temple	Controlled Fill
Str. J-3	Temple	Controlled Fill
Str. J-4	Temple	Controlled Fill
Str. J-5	Platform	Controlled Fill
Str. J-6	Palace	To Bedrock
Str. J-7	Platform	Controlled Fill
Str. J-9	Palace	Controlled Fill
Str. K-1	Unknown	Clearing
Str. K-5	Temple	To Bedrock
Str. K-6	Ballcourt	Clearing
Str. K-7	Unknown	Clearing
Str. O-12	Temple	Controlled Fill
Str. O-13	Temple	To Bedrock
Str. O-15	Sweat bath	Controlled Fill
Str. O-16	Unknown	Controlled Fill
Str. O-3	Unknown	Clearing
Str. O-4	Sweat bath	Clearing
Str. O-5	Unknown	Clearing
Str. O-7	Unknown	Clearing

Str. O-8	Unknown	Clearing
Str. O-9	Unknown	Clearing
Str. P-7	Sweat bath	To Bedrock
Plaza Court One	Palace	To Bedrock
Str. R-1	Temple	Clearing
Str. R-10	Temple	Controlled Fill
Str. R-11	Ballcourt	Controlled Fill
Str. R-13	Sweat bath	Clearing
Str. R-16	Temple	Clearing
Str. R-2	Unknown	Clearing
Str. R-3	Residence	Clearing
Str. R-3	Temple	To Bedrock
Str. R-4	Temple	Clearing

APPENDIX B: EXCAVATIONS AT PIEDRAS NEGRAS 1997-2000

Operation 1: Str. O-13

A: summit and terraces of Str. O-13
B: base and front area of Str. O-13
C: tunnels within Str. O-13

Operation 2: Residential area, 50 m. east of South Group Court

A: Strs. S-39, S-40, S-41
B: Strs. S-35 and S-36
C: Strs. S-38, S-39, and P-27
D: Strs. S-8, S-9, S-10, S-11, S-12, and S-13
E: Strs. S-11, S-17, and S-18
F: Strs. S-2 and S-44
G: Strs. S-5, S-6, S-7, S-8, and S-9
H: in front of Strs. S-17, S-18, and S-19

Operation 3: South Group Plaza

A-1: near Str. U-3
A-2: near Str. U-4
A-3: near Str. R-1
A-4: near Str. R-1
A-6: near Str. R-10
A-7: near Str. R-1
A-8: near Str. R-1
A-9: near Str. R-32
A-10: near Str. U-2
A-11: near Str. R-1
A-12: near Str. R-1

Operation 4: South Group Court

A-1: near Str. R-32
A-2: near Str. R-32
A-3: front of Str. R-6
A-4: front of Str. R-5
A-5: near Str. R-7
A-6: front of Str. R-7

Op. 4 Cont A-7: front of Str. R-8
A-8: front of Str. R-9
A-9: front of Str. R-10
A-10: center of South Group Court
A-11: near Str. R-5
A-12: northwest corner of South Group Court
A-13: northwest corner of South Group Court
A-15: southwest corner of South Group Court

Operation 5: P-7 Sweat bath
A: excavations within Str. P-7
B: excavations within, behind, and front of Str. P-7
C: excavations within and front of Str. P-7

Operation 6: Residential area, V-sector
A: near Str. V-28
B: Str. V-20
C: Str. V-1, V-2, and V-3
D: Str. V-17
E: Str. V-23
F: Str. V-11

Operation 7: Str. J-4
A: summit of J-4

Operation 8: Test pit near Turtle Petroglyph
A: base of cliff with petroglyph
B: niches below petroglyph

Operation 9: Second terrace, Str. J-3
A: second terrace, Str. J-3

Operation 10: Residential area, southeast of West Group Plaza
A: Str. O-15 and O-16
B: Str. O-23
C: Strs. O-19 and O-20
D: Str. O-30
E: Strs. O-25 and O-26
F: Str. O-24
Op 10 cont. G: near Str. N-7

H: Strs. N-7 and O-21
I: Strs. O-21, O-22, and O-23
J: Str. O-22
K: Strs. N-2, N-3, and N-4
L: Str. N-6

Operation 11: Patio 3, Acropolis (Golden [97, 98, 99], Pellecer [99])
A: near Str. J-20 (97, 98)
B: near Str. J-18
C: center of Patio 3
D: Str. J-23
E: trench between Str. J-19 and bedrock outcropping
F: Str. J-20 stairway
G: corner of Strs. J-20, J-23, and J-21
H: northwest side of Str. J-20
I: northwest side of Str. J-18

Operation 12: West Group Plaza
A-1: front of Str. K-5
A-2: front of Str. J-3
C: front of Str. J-1
D: foot of Str. J-2
E: center of West Group Plaza, on alignment
F: front of Str. O-17
G: near Str. O-17, close to Str. N-1 sweat bath
H: near Str. O-18
I: platform of Str. K-2
J: West Group Plaza
K: near Str. G-2

Operation 13: "Corridor" between Strs. R-7 and R-16
A-1: near Str. R-7
A-2: near Str. R-16
A-3: near Str. R-16
A-4: near Strs. R-16 and R-11a
A-5: near Strs. R-15 and R-16
A-6: near Str. O-2
A-7: near Str. R-15
A-8: near Str. O-5

Operation 14: Northwest Group Plaza

A-1: near Str. J-29
A-2: near Str. J-29
A-3: near Str. J-29
A-4: near Str. J-29
A-5: near Str. F-1
A-6: near Str. J-28
A-7: western center of Northwest Group Plaza
A-8: western center of Northwest Group Plaza
A-9: western center of Northwest Group Plaza
A-10: near Str. K-13

Operation 15: S-sector

A: Str. S-11
B: Str. S-12
C: Str. S-10
D: Str. S-8
E: Str. S-9
F-1: front of Str. S-9
F-2: front of Str. S-8
F-3: front of Str. S-11
F-4: front of Str. S-13

Operation 16: East Group Plaza

A-1: near stairway of Str. O-12
A-2: along east-west axis of Plaza
A-3: near Altar 4
A-4: along east-west axis of Plaza
A-5: southern area of Plaza
A-6: 10 m. from Altar 4
A-7: near Operation 1B-4a

Operation 17: C-sector

A-1: near Str. C-25
B-1: between Strs. C-32 and C-33

Operation 18: R-13 Sweat bath

A: within and around Str. R-13

Operation 19: K-sector
A-1: near Strs. K-16 and K-17
B-1: near Str. K-20
C-1: near Str. K-23
D-1: near Str. K-8
E-1: near Strs. K-29 and K-30

Operation 20: Residences to west of South Group Court
D: center of R-18 Group
E: behind Str.R-18
F: front of Str. U-14
G: front of Str. U-13
H: behind Str. T-2
I: front of Str. Q-3

Operation 21: West Group Court near Str. R-5
A: north of Str. R-5, west of Str. R-6

Operation 22: Southern periphery of Piedras Negras
A-1, 3, 4: west of Str. V-32
A-2: south of Str. V-35
B: near Str. Y-3

Operation 23: Plaza of Str. R-20
A: Plaza of Str. R-20
B: Str. R-20
C: near Str. R-31
D: Str. R-30
E: Strs. 18 and 31

Operation 24: Residential area, southeast of West Group Plaza, equals Operation 10
A-1: Str. O-23
A-2: in plaza between Strs. O-19 to 21, and O-23
A-3: between Strs. O-19 and O-20
A-4: in front of Str. O-21
A-5: between Strs. O-21 and O-16
A-6: in front of Str. O-16
A-7: back of Str. O-16
Op. 24, cont. A-8: in front of Str. O-16
A-9: back of Str. O-21

A-10: back of Str. O-21
A-11: back of Str. N-8
A-12: corner of Str. N-6
A-13: corner of Str. O-24
A-14: back of Str. O-24
B-1: near corner of Str. N-10
B-2: behind Strs. N-10 and N-11
B-3: near corner of Str. N-10
B-4: west of Str. N-7
B-5: near corner of Str. N-10
C: Str. N-19 terrace

Operation 25: Residences west of Str. K-5; equates to Operation 19
A-1 to -4: near Str. K-16
A-5: near Strs. K-9 and K-10
A-6 to -7: in front of Str. K-12
B and C: Str. K-16

Operation 26: Str. F-2, Northwest Group Plaza
A: Str. F-2
B: Str. E-2

Operation 27: S-19 Sweat bath
A: within and around Str. S-19

Operation 28: S-4 Sweat bath
A: S-4 Sweat bath

Operation 29: North of Str. K-5
A-1: center of plaza defined by Strs. G-9 to -11
A-2: between Strs. G-12 and G-14

Operation 30: Northwest of Str. K-5
A: near Strs. K-23 and K-24

Operation 31: Flat area to north of Str. K-5
A-1: behind Str. G-19
A-2 to -4: near Strs. G-16 and G-17

Operation 32: Patio 2, Acropolis

A-1: trench of University Museum
B-1: tunnel in Str. J-10
B-2: room of Str. J-10
G-1, G-4: inside Str. J-11, back central room
G-2, G-3: inside Str. J-12
G-5: inside Str. J-13
G-6: south room of Str. J-11
G-7: inside Str. J-22, southern section
G-8: inside of Str. J-9, northern room
G-9: cleaning of room, south of Str. J-21
G-10: inside Str. J-23
G-11: in front of Str. J-23
G-12: inside northern extreme of Str. J-21
G-14: Str. J-12 platform, intersection with terrace of Str. J-4
G-15: atop unmapped platform
G-16: platform at corner of Str. J-12, close to base of Str. J-4
G-17: foot of platform of Str. J-12
G-18: axis of stairway of Str. J-15

Operation 33: Residences in U-sector

A: Strs. U-16 and U-17, with patios
B: Str. U-17 and adjacent patio (98, 99)
C: Strs. U-8 and U-17, with adjacent patio (98, 99)
D: Strs U-18 and U-16 and adjacent terraces
E: base of Str. U-16 (98, 99)
F: Strs. U-5, U-6, testpitting in Str. U-19

Operation 34: Patio 1, Acropolis

A-1 to-15: Str. J-7 (98, 99)
A-16: Str. J-6, central rooms
A-18: Str. J-6, southwest room
A-19 to -22, Str. J-5 (99, 00)
A-23: inside floor of Burial 5

Operation 35: Testpits near Strs. T-1, T-3, and U-13

A: testpits
B: tespits

Operation 36: S-2 Sweat bath
A: within and around sweat bath

Operation 37: Strs. S-3, S-44, and S-45
A: Str. S-44
B: Str. S-3

Operation 38: Rural plaza group on road to Corregidora
A: three testpits

Operation 39: Str. R-1
A: front base of Str. R-1

Operation 40: Strs. N-7 and N-10
A: Str. N-7
B: Str. N-10

Operation 41: C-group, Strs. C-10 to -14
A: patio
B: Str. C-13
C-1 to -2: residential group to south of C-group, north of Str. C-3
C-3 to -4: south of Str. C-3
D: Str. C-12
E: Str. C-10

Operation 42: C-sector, north of C-group
A-1, A-2, A-4: front of Str. C-25
A-3, A-5: east of Str. C-28
B: Str. C-25, cleaning of looters' pit

Operation 43: O-4 Sweat bath, and Str. O-3
A: within and around sweat bath
B: Str. O-3

Operation 44: N-1 Sweat bath
A: surface collection from University Museum excavations
B: within and around sweat bath

Operation 45: Str. P-6
A: summit and stairway

Operation 46: Northwest Acropolis
A: Str. J-33
B: south of Str. J-24
C: northwest of Str. J-24
D: phosphate testing
E: Str. J-26

Operation 47: Str. R-5
A: temple summit
B: southwest basal terrace
C: northeast basal terrace (99, 00)
D: central axis, front, with tunnel inside Str. R-5

Operation 48: Str. J-1 terrace, into lower base of Str. J-4
A: stairway axis and adjacent pits
A-14, A-18, A-19: northeast corner of Str. J-1, near niche of Stela 7
A-15, A-17: 2 m. from A-4, front of southwest corner of Str. J-4 stairway
A-16: cleaning of northeast corner of Str. J-4 stairway
B: interior of stairway of Str. J-4
C: Str. J-4, inside substructure and early platform of Str. J-1
D: substructure inside Str. J-4

Operation 49: J-17 Sweat bath
A: within and around sweat bath

Operation 50: Between Strs. J-3 and J-18
A: behind Str. J-3, on Str. J-8
B: sub-structure platform of Str. J-18

Operation 51: Str. O-17 (Fitzsimmons [99, 00])
A: northern and southern sides
B: northern side, Str. O-17
C: eastern side, Str. O-17
D: all sides, Str. K-3
E: test pit in West Group Plaza, west of Str. K-3
F: test pit next to Str. K-6
G: all sides, Str. K-1

Operation 52: Str. N-4

A: south side
B: east side, Str. N-3
C: test pit between Strs. O-14 and O-15

Operation 53: Z sector

A-1 to A-5: plaza in front of Strs. Z-5, Z-6, and Z-7
A-6: behind Str. Z-6
A-7, A-8, A-9, A-11: front of Str. Z-8
A-10: on Str. Z-8
A-12: northeast corner of Str. Z-6
A-13: northeast corner of mound group
A-14: behind Str. Z-7
A-15: northwest corner of Str. Z-5
A-16: northeast corner of Str. Z-7
B-1, B-3: on Str. Z-5
B-2: on Str. Z-7
B-3: on Str. Z-6
C-1, C-8: south corner of Str. Z-2
C-2, C-3, C-4: southeast corner of Str. Z-2
C-5: northeast corner of Str. Z-2
C-6: northwest corner of Str. Z-2
C-7: southwest corner of Str. Z-1
C-8, C-10: north side of Str. Z-1
C-11, C-13: northeast side of group
C-12: west side of Str. Z-1
C-14: north side of Str. Z-1
D-1: on Str. Z-2

Operation 54: Excavations in Str. J-27

A-1: on J-27, in center of structure
A-2: on J-27, an extension of A-1
A-3: on J-27, in northwest section of J-27
A-4: on J-27, adjacent to and northwest of A-3
A-5: on J-27, adjacent to and northeast of A-4
A-6: on J-27, adjacent to and northwest of A-4
A-7: on J-27, northeast of A-6
A-8: on J-27, northeast of A-7
A-9: on J-27, northeast of A-8

Op. 54, cont. A-10: on J-27, northeast of A-9
A-11: on J-27, northeast of A-10
A-12: on J-27, southeast of A-11
A-13: on J-27, southeast of A-12
A-14: on J-27, southwest of A-13
A-15: on J-27, southwest of A-14
A-16: on J-27, southwest of A-15
A-17: on J-27, southwest of A-1
A-18: on J-27, northeast of A-1 and A-17
A-19 and A-20: on J-27, northeast of A-1 and A-17
A-21: on J-27, southwest of A-1 and A-17

Operation 55: Strs. R-3 and R-32
A: excavations around platform R-32 and within Temple R-3

Operation 56: Str. R-2
A-1: in front of stairway
A-2: behind Str. R-2, on axis
A-3: central part of top terrace
A-4: front platform
A-5: between lateral east wall of Str. R-3 and west side of Str. R-2

Operation 57: V group
A-1, A-4: on platform of Str. V-45
A-2: north side of Str. V-44
A-3: southwest side of Str. V-46
A-5: east corner of Str. V-43

Operation 58: Str. R-16
A: front base
B: summit
Operation 59: Strs. R-8
A: excavations within and around Str. R-8

Operation 60: Str. R-14
A: excavations within and around Str. R-14

Operation 61: Strs. S-5 and S-7 in S-sector (Garrido [00])
A1-A34: 2x2 m units on south side of Str. S-5
B1-B13: 2x2 units on south side of Str. S-7

Operation 62: G' and H' sector
A-1, A-7, A-8: on Str. H'-4
A-2: south corner of Str. H'-2
A-3, A-5: north corner of Str. G'-3
A-4: 1.50 m from northwest profile of A-1
A-6: between Strs. G'1- and G'-2
A-9, A-10, A-11: between Strs. G'-6 and G'-3

Operation 63: Str. O-12 (Escobedo [00], Zamora [00])
A-1: central axis of pyramid, on plaza, front of access stairway
A-2: unit inside summit temple, southwest wing

Rural Survey 26
A: stripping of plaza group

Rural Survey 27
A: stripping of plaza group (99, 00)
B: excavations around cave sweat bath

Rural Survey 28
A: stripping of plaza group

Rural Survey 29
A: stripping of residential group

Rural Survey 30
A: 7 testpits in multi-plaza group

Cave Survey 1A

Cave Survey 2A

APPENDIX C: PROVISIONAL CERAMIC GROUPS

Fase			Grupo
Hol	Sin Engobe	estriado	Achiotes
		alisado	Hol Alisado
	Monocromo	rojo	Joventud
		crema	Pital
		negro	Chunhinta
	Bicromo	rojo sobre crema	Tierra Mojada
Abal	Sin Engobe	estriado	Sapote
		alisado	AbalAlisado
	Monocromo	rojo	Sierra
		crema	Flor
		negro	Polvero
		café	Miel
	Bi/Tricromo	sobre negro	Metapa
		sobre naranja	Sacluc
		sobre rojo	Cangrejo
	Sin Engobe	estriado	Sapote
		alisado	Pom Alisado
Pom	Monocromo	rojo	Sierra
		crema	Flor
		negro	Polvero
		naranja	Aguila
		café	Pucte
	Bi/Tricromo	sobre negro	NA
		sobre naranja	Aguaseca
		sobre rojo	NA
	Polycromo	sobre naranja	Dos Arroyos
Naba	Sin Engobe	estriado	Triunfo
		alisado	Naba Alisado
	Monocromo	negro	Balanza
		café	Pucte
		naranja	Aguila
	Policroma	crema	Yaloche
		naranja	Dos Arroyos
Balche	Sin Engobe	estriado	Triunfo
		alisado	Derrota
	Monocromo	negro	Aceituna
		rojo	Cereza

Balche, cont.	Bicromo	XXXX sobre crema	Sai
		hematita sobre rojo	Eq
		rojo sobre naranja	Durazano
	Policroma	negativa sobre crema	Mataculebra
		con hema. sobre naranja	Tsak
		positiva sobre naranja	Chol
Yaxche	Sin Engobe	estriado	Encanto
		alisado	Yaxche Alisado
	Monocromo	negro	Mal Amigo
		rojo	Martin
		naranja	Saraguate
		crema	Nube
		café	Kanche
	Bicromo	XXXX sobre crema	Corozo
		rojo sobre naranja	Coabano
		XXXX sobre rojo	Gallina
	Policroma	negative, sobre crema	Sta. Rosa
		positiva , sobre crema	Ahk
		positiva , sobre naranja	Lancha
		positiva, sobre rojo	Sangre
	Pastas Finas	Gris Fino	Chablekal
Chacalhaaz	Sin Engobe	estriado	Encanto
		alisado	Chac. Alisado
		pintura, sin engobe	Pirueta
	Monocromo	negro	Pai
		rojo	Tinaja
		naranja	Chub
		crema	Marqueta
		café	Buul
	Bicromo	rojo obre crema	Tres Champas
		rojo sobre naranja	Diamante
		XXXX sobre rojo	Tortola
	Policroma	bandas sobre rojo	Bolonchac
		policroma, con monos	Hutzijan
		negativa, sobre crema	Sta. Rosa
		positiva , sobre crema	Lemba
		positiva , sobre naranja	Chinche
		positiva, sobre rojo	Vino Tinto
	Pastas Finas	Importado	Importados
		Otros	Otros

Kumche	Sin Engobe	estriado	Precoz
		alisado	Lento
	Monocromo	black	Hormiga
		red	Camaron
		naranja	Fuego
		café	Coco
	Policromo	sobre naranja	Payaso
		bandas sobre rojo	Bolonchac

APPENDIX D: TYPE DATA CODES

Proyecto Piedras Negras - Clave de Códigos

Cerámica Decorada/Policromada - 2nd revisión -27 Junio 2002

Fase = Abal, Hol, Naba, etc.
Grupo/ Tipo = ej. Saraguate/Perlas. Si no hay tipo entonces marcar NA
Variedad/ Subgrupo = nombre de variedad, subgrupo (para monocromas)

1. **Procedencia =** PN/RS, Op, Subop., Uni. Etc.

2. **Forma**
   Desconocida = 0.0
   Basin = 1
   1.1 = pared divergente
   1.2 = pared curvo-divergente
   1.3 = pared curvada
   1.4 = pared curvo-convergente
   1.5 = pared curvo-vertical

   Cuenco = 2
   2.1 = pared divergente
   2.2 = pared curvo-divergente
   2.3 = pared curvada
   2.4 = pared curvo-convergente
   2.5 = pestaña basal
   2.6 = pestaña medial
   2.7 = ángulo-z
   2.8 = compuesto
   2.9 = otro (especificar)
   2.11 = con pared vertical

   Cilindro = 3
   3.1 = pared vertical
   3.2 = pared divergente
   3.3 = pared curvo-divergente
   3.4 = pared curvo-convergente
   3.5 = Silueta Compuesta

   Plato = 4
   4.1 = pared vertical
   4.2 = pared divergente
   4.3 = pared curvo-divergente
      4.4 = pared curvo-convergente
      4.5 = pestaña basal
   4.6 = pestaña medial
   4.7 = pared curvada
   4.8 = compuesto
   4.9 = pestaña basal modificada

   Cántaro = 5
   Olla = 6 (para cocinar)
   Incensario = 7
   7.1 = sahumerio
   7.2 = taza
   7.3 = zoomorfo
   7.4 = antropomorfo
   7.5 = ceiba
   7.6 = cilíndrico
      7.6.a = tallado
      7.6.b = de "corona"
   Comal = 8.0 (vea ilustración)
      8.1 = plano
      8.2 = cóncava
   Tecomate = 9
   Tapadera = 10
      10.1= disco
         10.1a = plana
         10.1b = curvada
         10.2 = escudo
         10.3 = con borde ganchudo
         10.4 = compuesto
      Tambor =11
      Miniatura = 12
   12.2 = cuenco
   12.3 = cilindro
   12.4 = plato
   12.5 = cántaro
   12.6 = olla
   12.7 = otro (especificar)

Ladrillo = 13
Otro= 14 (especificar)

3. Parte

Borde = 1
1.1 = directo cuadrado
1.1.a = directo acanaldura
1.2 = evertido plano
1.2a = evertido y acanaldura
1.3 = evertido angulado abajo
1.4 = evertido angulado arriba
1.5 = reforzado exterior
1.5.a = reforzado redondo
1.5.b = reforzado ovalado
1.6 = reforzado interior
1.7 = evertido y reforzado/ engros.
1.8 = evertido y ganchudo
1.9 = ganchudo al interior
1.10 = triangular
1.10.a = triangular y redondo
1.10.b = tri. y redondo con acanal./inc.
1.10.c = triangular y cuadrado
1.10.d = triangular y cuadrado con acanaldura/ incisión
1.11 = triangular reforzado ext.
1.11.a = tri. y red. refor. ext.
1.11.b = trian. y red. reforz. ext. y acanaladura
1.11.c = trian. y cuadrado con reforzado ext.
1.11.d = trian. y cuadrado, reforzado ext. y acanaldura
1.12 = triangular reforzado interior
1.12.a = trian. y redondo con reforzado int.
1.12.b = trian. y redondo con reforzado int. y acanal.
1.12.c = trian. y cuadrado con reforzado int.
1.12.d = trian. y cuad.
1.13 = trian. con reforz. int. y ext.
1.13.a = con acan./ inciso
1.14 = bisel interior
1.15 = directo agudo
1.16 = directo redondo
1.17 = inciso
1.18 = tallado
1.19 = bisel exterior
1.20 = reforzado con acanaladura
1.20.a = reforz. redondo c/ acanaladura
1.20.b = reforz. oval c/ acanaladura
1.21 = directo engrosado
1.21.a = engrosado exterior
1.21.b = engrosado interior
Cuello = 2
2.1 = vertical
2.2 = curvo-divergente
2.3 = divergente
2.4 = bulto (bulging)
2.5 = especificar
Base = 3
3.1 = plana
3.2 = convexa
3.3 = cóncava
3.4 = plataforma
3.5 = anular
3.6 = pedestal
3.7 = compuesto (ver ilustración)
3.8 = plana con incisión
3.9 = arremetida
3.11 = reforzada (ver ilustración)
Soporte = 4
S = Sólido
H = Hueco
C = Con sonaja
4.1 = cónico
4.2 = esférico
4.3 = mamiforme
4.4 = cilindro
4.5 = almenado
4.6 = zoomorfo
4.7 = otro
4.8 = de botón
Hombro = 6 (de cántaro/ olla)
6.1 = alisado
6.2 = estriado
6.3 = con impresión de uña
6.4 = con aplicación

Decoración, General

4. Engobe

A = Alisado
E = Estriado
1 = Crema

2 = Naranja
3 = Rojo
4 = Café
5 = Negro
6 = Naranja sobre crema
7 = Rojo sobre crema
8 = Café sobre crema
9 = Negro sobre crema
Compuesto (Ej. A3 = Alis. y con engobe rojo)

5. Decoración

1 = Monocroma
2 = Bicroma
3 = Policroma
4 = Positiva
5 = Negativa
6 = Positiva y Negativa
7 = Incisa/ Tallada/ Guiada/ Acanalada, etc.
8 = Aplicación
Compuesto (Ej. 24 = bicromo inciso)

6. Ubicación de Decoración, General

1 = Sólo Exterior
2 = Sólo Interior
3 = Interior y Exterior

7. Decoración Exterior, General

- = Ninguna (sin engobe o alisado/ estriado)
0 = Erosionado
1 = Monocromo
2 = Bicromo
3 = Policromo
4 = Inciso
5 = Tallado
6 = Gubiada
7 = Acanaldura
8 = Achaflanado
9 = Como Calabaza (Gadrooned)
11. Aplicación
Compuesto (Ej. 24 = bicromo inciso)

8. Decoración Interior, General

- = Ninguna (sin engobe o alisado/ estriado)
0 = Erosionado
1 = Monocromo
2 = Bicromo
3 = Policromo
4 = Inciso
5 = Tallado
6 = Gubiada
7 = Acanaldura
8 = Achaflanado
9 = Como Calabaza
11. Aplicación
Compuesto (Ej. 24 = bicromo inciso)

Organización de Decoración, Interior

9. Ubicación de Decoración, Int.

1 = Labio
2 = Pared
3 = Fondo
Compuesto = combinación

Labio

10. Tema
Ver códigos para "Temas Mayores de un Diseño Especifico" en pagina 7

11. Distribución
0 = ninguno
1 = repetido/ continuo
2 = distribuido en dos lados
3 = distribuido en tres lados
4 = distribuido en cuatro lados
5 = no distinguible

Pared

12. Tema
Ver códigos para "Temas Principales de un Diseño Especifico" en pagina 7

13. Distribución
0 = ninguno
1 = repetido/ continuo
2 = distribuido en dos lados
3 = distribuido en tres lados
4 = distribuido en cuatro lados
5 = no distinguible

Fondo

14. Tema

Ver códigos para “Temas Mayores de un Diseño Especifico” en pagina 7

15. Distribución

0 = ninguno
1 = central
2 = repetido/ continua
3 = distribuido en dos lados
4 = distribuido en tres lados
5 = distribuido en cuatro lados
6 = no distinguible

16. Ubicación de Diseño Principal, Int.

1 = Labio
2 = Pared
3 = Fondo
compuesto
(Ej. 13 = solo borde y base están decorados)

17. Distribución de Diseño Principal, Int.

0 = ninguno
1 = central
2 = repetida/ continuo
3 = distribuido en dos lados
4 = distribuido en tres lados
5 = distribuido en cuatro lados
6 = no distinguible

18. Técnica Decorativa, Diseño Principal, Int.

1 = Bicroma
1.1 = Positiva
1.2 = Negativa
1.2.a = resistente (como Moro)
1.2.b = resistente (manchado)
1.2.c = reservada
1.2.d = resistente y reservada
1.3 = Positiva y Negativa
2 = Policroma
2.1 = positiva
2.2 = negativa
2.2.a = resistente
2.2.b = reservada
2.2.c =resistente y reservada
2.3 = positiva y negativa
3 = Incisa / Tallada / Gubiado
1 = incisa
2 = tallada
3 = gubiado
4 = modelada
5 = acanalada
6 = achaflanada
7 = como calabaza
compuesta (Ej. 24 indica tallado y modelado)

19. Tema Principal del Diseño, General

(Ver códigos en pagina 7)

20. Tema Principal de Diseño, Especifico

(Ver códigos en pagina 7)

Organización del Diseño, Ext.

21. Ubicación de Decoración, Exterior

1 = sólo registro superior
2 = sólo registro central
3 = sólo registro inferior
4 = todo el exterior
5 = borde/ labio
6 = basal

Registro Superior (Borde/ Labio)

22. Banda Sobre el Borde

0 = Ninguna
1 = Crema
2 = Naranja
3 = Rojo
4 = Hematita
5 = Café
6 = Negro
7 = Incisa/ Tallada/ etc.
8 = Diseño Geométrico
9 = Diseño Iconográfico/ Veg.
compuesto
(Ej. 38 = diseño geo. hecho en rojo)

23. Enmarcado Superior

0 = Ninguno

1 = Crema
2 = Naranja
3 = Rojo
4 = Hematita
5 = Café
6 = Negro
7 = Inciso/ Tallado/ etc.
8 = Diseño Geométrico
9 = Diseño Iconográfico/ Veg.

Registro Inferior

24. Banda Sobre la Base
(ver códigos para "Banda Sobre Borde")

25. Enmarcado Inferior
(ver códigos para "Enmarcado Superior.)

26. Distribución de Diseño Principal
0 = ninguno
1 = central
2 = repetido/ continuo
3 = distribuido en dos lados
4 = distribuido en tres lados
5 = distribuido en cuatro lados
6 = no distinguible

27. Técnica Decorativa, Diseño Principal
1 = Bicroma
  1.1 = Positiva
  1.2 = Negativa
    1.2.a = resistente (como Moro)
    1.2.b = resistente (manchado)
    1.2.c = reservado
    1.2.d = resistente y reservado
  1.3 = Positiva y Negativa
2 = Policroma
  2.1 = positiva
  2.2 = negativa
    2.2.a = resistente
    2.2.b = reservada
    2.2.c =resistente y reservada
  2.3 = positiva y negativa
3 = Incisa/ Tallada/ Gubiada
  1 = incisa
  2 = tallada
  3 = Gubiada
  4 = modelada
  5 = acanalada
  6 = achaflanada
  7 = como calabaza
  compuesta (Ej. 23 indica tallada y modelado)

28. Tema de Diseño Principal
(ver códigos en pagina 7)

29. Temas Principales del Diseño, Especifico
(ver códigos en pagina 7)

Datos Morfológicos

30. Ancho de Borde = en centímetros
31. Diámetro = tabla de diámetro. En cm.
32. % de Diámetro = el area en cm
33. Color de Engobe (para monocromos)
Munsell # 1=y
2=y/r
3=r
e.g. 1.5yr 2/5 = 15225

34. Color de Pasta
Munsell # igual al color de engobe

35. Inclusiones
1.0 = Hierro
2.0 = Mica
3.0 = Otro

36. Desgrasante
1 = Calcio sin cristalizar
2 = Calcio cristalizado
3 = Calcio cristalizado y sin cristalizar
4 = Cuarzo
5 = Concha
6 = Ceniza
7 = Arena

Tamaño y % de Desgrasante = Orton
37. Desgrasante Fino

38. Desgrasante Grueso

39. Núcleo? 0=absent, 1=present

40. Manchado

0 = ausente
1 = interior
2 = exterior
3 = interior y exterior

Temas Principales del Diseño, Especifico

1 = Geométrico
- 1.1 = Líneas horizontales
- 1.2 = Líneas verticales
- 1.3 = Líneas diagonales
- 1.4 = Cuadros
- 1.5 = Triángulos
- 1.6= Piramidal (escalones)
- 1.7= Escalonadas
- 1.8 = Ashurado
- 1.9 = X's
- 1.11 = Grecas
- 1.12 = Chevrones
- 1.13 = Volutas
- 1.14 = Circulos
- 1.15 = Discos
- 1.16 = Bandas
  - 1.16.a = bandas verticales
  - 1.16.b = bandas horizontales

2 = Fitomorfo
- 2.1 = flores
- 2.2 = semilla (como cacao)
- 2.3 = otro

3 = Zoomorfo
- 3.1 = Pájaro
- 3.2 = Pez
- 3.3 = Mono
- 3.4 = Conejo
- 3.5 = Murciélago

3.6 = Abeja
- 3.7 = Serpiente
- 3.8 = Venado
- 3.9 = Tortuga
- 3.9 = Otro

4 = Jeroglifico
- 4.1 = Pseudoglifos
- 4.2 = Nombre de Gobernante
- 4.3 = Nombre Desconocido
- 4.4 = Titulo
- 4.5 = Deidad
- 4.6 = Frase
- 4.7 = Desconocido/ Fragmento

5 = Calendárico
- 5.1 = numero
- 5.2 = fecha
- 5.3 = nombre de dia

6 = Iconográfico
- 6.1 = Pop/ Metate
- 6.2 = Orejera
- 6.3 = Ik
- 6.4 = Patolli
- 6.5 = Diseño Mexicano
- 6.6 = Serpiente
- 6.7= Otro

7 = Antropomorfo
- 7.1 = Personaje
- 7.2 = Deidad
- 7.3 = Otro

Tema de Diseño Principal, General

0 = Ninguno
1 = Geométrico
2 = Fitomorfo
3 = Zoomorfo
4 = Jeroglifico
5 = Calendarico
6 = Iconográfico
7 = Antropomorfo

APPENDIX E: PIEDRAS NEGRAS CERAMIC TYPOLOGY

HOL

Ware	**Group**	**Type:Variety**
Uaxactun Unslipped	Achiotes	Achiotes Unslipped: VU
		Macabilero Unslipped: Macabilero
Flores Waxy	Joventud	Joventud Red: VU
		Joventud Red: Jolote
		Guitara Incised: Pollo Desnudo
		Guitara Incised: VU
		Chunhinta Chunhinta Black: VU
		Pital Pital Cream: VU
		Paso Danto Incised: VU
		Tierra Mojada Tierra Mojada: VU
		Timax Incised: Timax

ABAL

Ware	**Group**	**Type:Variety**
Uaxactun Unslipped	Achiotes	Achiotes Unslipped: Achiotes
		Achiotes Unslipped: VU
		Macabilero Unslipped: Macabilero
		Undesignated Unslipped
	Sapote	Sapote Striated: Sapote
		Sapote Striated: VU A
		Altamira Fluted: Altamira
		Laguna Verde Incised: Laguna Verde
		Laguna Verde: Mito
Paso Caballo Waxy	Flor	Flor Cream: Flor
		Flor Cream : VU A
		Flor Cream: VU B
		Cantutse Incised: Cantutse
	Polvero	Polvero Black: Polvero
	Polvero	Polvero Black: VU
		Lechugal Incised: VU
		La Vaca Bichrome: La Vaca

ABAL, cont.

Ware	Group	Type:Variety
Paso Caballo	Boxcay	Boxcay Brown: Boxcay
		Boxcay Brown: Frijol
		Esclavos Incised: Esclavos
Usumacinta Unslipped	Quemadal	Quemadal Unslipped: Quemadal
		La Línea Incised: La Línea
El Macho Micaceo	Pejelagarto	Pejelagarto Red: Pejelagarto
		Pasadota Incised: Pasadota
		Cojolita Bícromo: Cojolita
	Karst	Karst Cream: Karst
		Dolines Red-on-Cream: Dolines
		Okol Incised : Okol
		Selva Alta Copal Bícromo: Copal
	Boca del Cerro	Boca del Cerro Brown:
		Comillas Incised: Comillas

POM

Ware	Group	Type:Variety
Uaxactun Unslipped	Achiotes	Conejito Red-on-Unslipped: Conejito
	Sapote	Sapote Striated: Sapote
	Texcoco	Texcoco Unslipped: Cuxu
		Mogotes Unslipped: Mogotes
Paso Caballos	Sierra	Sierra Red: Elchuuk
		El Pato Bichrome: El Pato
		Altamira Fluted: Papaya
		Laguna Verde Incised: Sahal
		Laguna Verde: Mito
		Flor Flor Cream: Flor
	Polvero	La Vaca Bícromo: La Vaca
	Boxcay	El Chorro Bícromo: El Chorro
	Campo Verde	Campo Verde Resist: Campo Verde

POM, cont.

Ware	Group	Type:Variety
Usumacinta	Quemadal	Quemadal Unslipped: Quemadal
		La Línea Incised: La Línea
	Tornillo	Tornillo Striated: Tornillo
El Macho Micaceo	Pejelagarto	Pejelagarto Red: Pejelagarto
		Pasadota Incised: Pasadota
		Cojolita Bícromo: Cojolita
	Karst	Karst Cream: Karst
		Ti Ha Incised: Ti Ha
		Okol Incised: Okol
		Selva Alta Selva Alta Black: Selva Alta
		Jotil Incised: Jotil
		Copal Bícromo: Copal
	Nespa	Nespa Orange: Nespa
		Izcan Incised: Izcan
	Boca del Cerro	Boca del Cerro Brown: Boca del Cerro
	Aguaseca	Aguaseca Resist: Aguaseca
Peten Gloss	Aguila	Aguila Naranja:Menche
		Virgilio Bícromo:Tillom
		Buj Inciso:Buj
		Undesignated Incised A
		Undesignated Streaky Orange A
	Pucte	Ka Incised: Tun
		Eco Brown: Eco
	Dos Arroyos	Otatal Orange Polychrome: Otatal

NABA

Ware	Group	Type:Variety
Uaxactun Unslipped	Texcoco	Texcoco Unslipped: Texcoco
		Texcoco Unslipped: Temper Drag
		Texcoco: Hombro Impreso
Uaxactun Unslipped	Texcoco	Ojo Negro Applique: Ojo Negro
		Trebol Applique: Trebol

NABA, cont.

Ware	Group	Type:Variety
	Gardunza	Gardunza Striated: Gardunza
		Gardunza Striated: Finger Impressed
Peten Gloss	Balanza	Balanza Black: Yonal
		Lucha Incised: VU
		Paradero Fluted: Paradero
		Urita Gouged-Incised: Urita
		San Roman Plano-Relief: San Roman
	Pucte	Pucte Brown: K´an
		Ka Incised: Ka
		Chiclero Fluted: Chiclero
		Contrabandista Gouged-Inc.: Contraband.
	Aguila	Aguila Orange: Nemegue
		Xatero Fluted: Xatero
		Virgilio Bícromo: Virgilio
	Xab Incised: Xab	
		Buj Incised: Buj
		San Clemente Gouged-Incised: VU
		Pococalado Plano-Relief: Pococalado
		Undesignated Bichrome Incised:
	Matutino	Yaloche Cream Polychrome: VU
		Undesignated Cream Incised
		Undesignated Cream Resist
		Undesignated Grooved-Incised
	Tzak	Tzak Polychrome: Tzak
		Eq Red-on-Orange: Eq
	Otatal	Otatal Orange Polychrome: Otatal
		Otatal Orange Polychrome: Garza Gorda
		Otatal Orange Polychrome: VU
Peten Gloss	Dos Arroyos	Dos Arroyos Orange Polychrome: VU

BALCHE

Ware	**Group**	**Type:Variety**
Uaxactun	Texcoco	Texcoco Unslipped: Texcoco
Unslipped		Texcoco Unslipped: Temper Drag
		Texcoco Unslipped: Filo
		Texcoco Unslipped: Hombro Impressed
	Portal	Portal Unslipped: Portal
		Metzaboc Unslipped: Metzaboc
	Gardunza	Gardunza Striated: Gardunza
		Gardunaza Striated: Finger Impressed
	Encanto	Petate Striated: Petate
Petén Gloss	Balanza	Lucha Incised: VU
		Urita Gouged-Incised: Urita
		Paradero Fluted: Paradero
		Bos Bos Black: Bos
Petén Gloss	Pucte	Chico Brown: Chico
		Chico Brown: Pálido
	Aguila	Aguila Orange: Mehen
		Virgilio Bícromo: Virgilio
		Xatero Fluted: Xatero
		Buj Incised: Buj
	Durazno Red-on-Orange: Durazno	
		Undesignated Incised:
	Otatal	Otatal Orange Polychrome: Garza Gorda
		Chol Orange Polychrome: Chol
	Tzak	Eq Red-on-Orange: Eq
		Tzak Polychrome: Tzak
		Tzak Polychrome: Ruby
	Palmar	Saxche Orange Polychrome: Saxche
		Saxche Orange Polychrome: VU
	Palmar	Saxche Orange Poly: Interior-Exterior
		Saxche Orange Poly: Reserve-Resist
		Matutino Sai Red-on-Cream: Sai
		Bethel Bícromo-Incised: Bethel

BALCHE, cont.

Ware	Group	Type:Variety
Peten Gloss	Santa Rosa	Mataculebra Cream Polychrome: Mata.
		Saxche Orange Poly.: Interior-Exterior
		Porvenir Cream Polychrome: Porvenir
		Playona Cream Polychrome: Playona
		Moro Orange Polychrome: Moro
		Moro Orange Poly.: Finger Nail Imp.

YAXCHE

Ware	Group	Type:Variety
Uaxactun Unslipped	Portal	Portal Unslipped: Portal
		Portal Unslipped: Arrastre
	Texcoco	Texcoco Unslipped: Filo
	Encanto	Petate Striated: Petate
Peten Gloss	Bos	Bos Black: Bos
		Tepocate Bichrome: Tepocate
		Black Fine Line Incised:
	Kanche	Kanche Brown: Kanche
		Kanche Brown: Luum
		Chencheha Incised: Chencheha
		Undesignated Brown Carved
Peten Gloss	Uvalas	Uvalas Red-Orange: Uvalas
		Uvalas Red-Orange: Dicroma
		Uvalas Red-Orange: Gallina
	Tinaja	Anaite Red: Anaite
		Anaite: Pachyra
		Tinaja Red: Matte
		Tinaja Red: Tractor
	Saraguate	Saraguate Orange: Búho
		Saraguate Orange: Saraguate
		Saraguate Orange: Estriada
		Coabano Red-on-Orange: Coabano
		Orange Monocromo Incised:

YAXCHE, cont.

Ware	**Group**	**Type:Variety**
Peten Gloss	Santa Rosa	Santa Rosa Cream Polychrome: Horqueta
		Santa Rosa Cream Polychrome: Negra
		Santa Rosa Cream Polychrome: Int.-Ext.
		Yokib Incised-Negativo: Yokib
		Suktan Cream Polychrome: Suktan
		Suktan Cream Polychrome: VU
	Palmar	Saxche Orange Polychrome: Saxche
		Saxche Orange Polychrome: VU
		Guadua Orange Polychrome: Guadua
		Palmar Orange Polychrome: Palmar
		Palmar Orange Poly.: Resist-Reserve
		Palmar Orange Polychrome: Alas
	Ahk	Ahk Incised: Ahk
		Pacal Incised: Pacal
		Nacimiento Incised: Nacimiento
		Undesignated Red and Black on Cream:
		Undesignated Fine line Incised:

CHACALHAAZ

Ware		**Group Type:Variety**
Uaxactun Unslipped	Cambio	Cambio Unslipped
		Portal Unslipped: Portal
		Portal Unslipped: Chichic
		Miseria Applique: Spiked
		Miseria: Hollow Handle
		Granizo Unslipped: Granizo
		Metzaboc Unslipped: Metzaboc
		Pantano Impreso: Pantano
		Sargento Red-on-Unslipped: Sargento
		Undesignated Molded/Modeled Type
	Encanto	Petate Striated: Quinil
		Petate Striated: Petate
		Petate Striated: Sadatay
Peten Gloss	Tinaja	Tinaja Red: Tinaja
		Tinaja Red: Leche

CHACALHAAZ, cont.

Ware	**Group**	**Type:Variety**
Peten Gloss	Tinaja	Tinaja Red:Tractor
		Tinaja Red: Siguan
	Chub	Perlas Red-Orange: Perlas
		Chub Orange: Chub
		Subida Orange: Subida
		Streaky Red-on-Orange:
		Isleta Fluted: Isleta
		Isleta Fluted Modeled Rim
		Chancala Impressed Incised: Chancala
		Diamante Red-on-Orange: Diamante
		Undesignated Black-on-Orange
		Cañon Modelado-Tallado: Cañon
		Undesignated Chacalhaaz Glyph Incised
	Pai	Pai Black: Pai
		Pai Black: Tenamaste
		Chilar Fluted: Chilar
		Keh Fluted: Keh
		Cantil Incised: Cantil
		Jato Black-on-Gray: Jato
		El Bosque Simple-Incised:El Bosque
		Undesignated Black Molded
	Buul	Buul Brown: Buul
		Buul Brown: Pinto
		Buul Brown: Striated
		Mal Amigo Zoned Fluted: Mal Amigo
		Hormiga Grooved: Hormiga
		Hormiga Grooved: Chevron
		Raudel Fluted: Raudel
		Raudel Fluted: Borde Modelado
		Budsilha Punctate-Incised: Budsilha
		Libertad Incised: Libertad
		Pachanga Incised: Pachanga
	Chinche	Bolonchac Orange Polychrome:
	Bolonchac	Bolonchac Orange Poly.: Int. Slipped

		Bolonchac Orange Poly.: Guapaque

CHACALHAAZ, CONT.

Ware	**Group**	**Type:Variety**
Peten Gloss	Bolonchac	Bolonchac Orange Poly,: Smudged Int.
		Hutzijan Polychrome: Hutzijan
		Chacalha Orange Polychrome: Chacalha
		Chinche Orange Polychrome: Chinche
		Buhtil Orange Polychrome: Buhtil
		Buhtil Orange Polychrome: Cedrillo
		Pirueta Orange Polychrome: Pirueta
	Palmar	Palmar Orange Polychrome:Palmar
	Santa Rosa	Santa Rosa Cream Polychrome: Horqueta
		Santa Rosa Cream Polychrome: Negra
		Santa Rosa Cream Polychrome: Int-Ext.
		Lemba Cream Polychrome: Lemba
		Suktan Cream Polychrome: Suktan
	Zacatel	Chinos Black-on-Cream: VU
		Zacatel Cream Polychrome: VU
		Tres Champas Red-on-Cream: Tres
Champas		
		Undesignated Cream Polychrome
	Chablekal	Chablekal Fine Gray: Chablekal
		Telchac Composite: Telchac
		Chicxulub Incised: Chicxulub
		Cholul Fluted: Cholul

KUMCHE

Ware	**Group**	**Type:Variety**
Uaxactun	Cambio	Portal Unslipped : Sotz
		Portal Unslipped: Chichic
	Encanto	Petate Striated: Quinil
		Undesignated Fine Line Incised

KUMCHE, cont.

Ware	**Group**	**Type:Variety**
Petén Gloss	Tinaja	Tinaja Red: Tinaja
		Tinaja Red: Tractor
	Chub	Chub Orange: Chub
		Perlas Red-Orange: Perlas
	Pai	Pai Black: Pai
		Pai Black: Tenamaste
	Buul	Buul Brown: Buul
		Buul Brown: Pinto
	Chinche	Bolonchac Orange Poly: Bolonchac
		Bolonchac Orange Poly,:Guapaque
		Bolonchac Orange Poly..-Smudged
		Bolonchac Orange Poly.:Int. Slipped
Fine Gray	Tres Naciones	Tres Naciones Fine Gray: Tres Naciones
Fine Orange	Altar	Altar Orange: Altar
		Provincia Plano-Relief: Provinicia
		Pabellon Modeled-Carved: Pabellon
		Cedro Gadrooned: Cedro
		Trapiche Incised: Trapiche

POST CLASSIC

Ware	**Group**	**Type:Variety**
Uaxactun	Cambio	Cambio Unslipped
	Pedregal	Modeled: Pedregal
Fine Paste	Silho	Silho Fine Orange:VU

Alphabetical Listing of Types and Varieties

F, CONT.

Flor Cream: VU B

G

Gardunza Striated: Finger Impressed
Gardunza Striated: Gardunza
Granizo Alisado: Granizo
Guadua Orange Polychrome: Guadua
Guitara Incised: Pollo Desnudo
Guitara Incised: VU

H

Hormiga Grooved: Chevron
Hormiga Grooved: Hormiga
Hutzijan Polychrome: Hutzijan

I

Isleta Fluted Modeled Rim
Isleta Fluted: Isleta
Izcan Incised: Izcan

J

Jato Black-on-Gray: Jato
Jotil Incised: Jotil
Joventud Red: Jolote
Joventud Red: VU

K

Ka Incised: Ka
Ka Incised: Tun
Kanche Brown: Kanche
Kanche Brown: Luum
Karst Cream: Karst
Keh Fluted: Keh

L

La Línea Incised: La Línea
La Vaca Bichrome: La Vaca
Laguna Verde Incised: Laguna Verde
Laguna Verde Incised: Sahal
Laguna Verde: Mito

L, CONT.

Lechugal Incised: VU
Lemba Cream Polychrome: Lemba
Libertad Incised: Libertad
Lucha Incised: VU

M

Macabilero Unslipped: Macabilero
Mal l Amigo Zoned Fluted: Mal Amigo
Mataculebra Cream Poly.: Mataculebra
Metzaboc Unslipped: Metzaboc
Miseria Applique: Spiked
Miseria: Hollow Handle
Mogotes Unslipped: Mogotes
Moro Orange Poly.: Finger Nail Impressed

N

Moro Orange Polychrome: Moro
Nacimiento Incised: Nacimiento
Nespa Orange: Nespa

O

Ojo Negro Applique: Ojo Negro
Okol Incised : Okol
Otatal Orange Polychrome: Garza Gorda
Otatal Orange Polychrome: Otatal
Otatal Orange Polychrome: VU

P

Pabellon Modeled-Carved: Pabellon
Pacal Incised: Pacal
Pachanga Incised: Pachanga
Pai Black: Pai
Pai Black: Tenamaste
Palmar Orange Polychrome: Alas
Palmar Orange Polychrome: Palmar
Palmar Orange Poly.: Resist-Reserve
Pantano Impreso: Pantano
Paradero Fluted: Paradero
Pasadota Incised: Pasadota
Paso Danto Incised: VU

P, CONT.

Pedregal Modeled: Pedregal
Pejelagarto Red: Pejelagarto
Perlas Red-Orange: Perlas
Petate Striated: Petate
Petate Striated: Quinil
Petate Striated: Sadatay
Pirueta Orange Polychrome: Pirueta
Pital Cream: VU
Playona Cream Polychrome: Playona
Pococalado Plano-Relief: Pococalado
Polvero Black: Polvero
Polvero Black: VU
Portal Unslipped: Portal
Portal Unslipped : Sotz
Portal Unslipped: Arrastre
Portal Unslipped: Chichic
Portal Unslipped: Portal
Porvenir Cream Polychrome: Porvenir
Provincia Plano-Relief: Provinicia
Pucte Brown: K´an

Q

Quemedal Unslipped:Quemedal

R

Raudel Fluted:Modeled Border
Raudel Fluted: Raudel

S

Sai Red-on:Cream:Sai
San Clemete Gougde-Inc.: San Clemente
San Roman Plano Relief:San Roman
Santa Rosa Cream Polychrome: Horqueta
Santa Rosa Cream Polychrome: Int.-Ext.
Santa Rosa Cream Polychrome: Negra
Sapote Striated: Sapote
Sapote Striated: VU A
Sapote Striated: VU B
Saraguate Orange: Búho
Saraguate Orange: Estriada
Saraguate Orange: Saraguate
Sargento Red-on-Unslipped: Sargento
Saxche Orange Polychrome: Int.-Ext.

S, CONT.

Saxche Orange Poly.: Resist-Reserve
Saxche Orange Polychrome: Saxche
Saxche Orange Polychrome: VU
Selva Alta Black: Selva Alta
Sierra Red: Elchuuk
Sierra Red: Sierra
Sierra Red: Tzu-Tzu
Silho Fine Orange
Streaky Red-on-Orange
Subida Orange: Subida
Suktan Cream Polychrome: Suktan
Suktan Cream Polychrome: VU

T

Telchac Composite:Telchac
Tepocate Bichrome: Tepocate
Texcoco Unslipped: Cuxu
Texcoco Unslipped: Filo
Texcoco Unslipped: Hombro Impreso
Texcoco Unslipped: Temper Drag
Texcoco Unslipped: Texcoco
Texcoco: Hombro Impreso
Ti Ha Incised: Ti Ha
Tierra Mojada: VU
Timax Incised: Timax
Tinaja Red: Leche
Tinaja Red: Matte
Tinaja Red: Siguan
Tinaja Red: Tinaja
Tinaja Red: Tractor
Tornillo Striated: Tornillo
Trapiche Incised: Trapiche
Trebol Applique: Trebol
Tres Champas Red-on-Cr.:Tres Champas
Tres Naciones Fine Gray: Tres Naciones
Tzak Polychrome: Ruby
Tzak Polychrome: Tzak

U

Undesignated Bichrome Incised
Undesignated Black Molded
Undesignated Black-on-Orange
Undesignated Brown Carved

V

X

Y

Z

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