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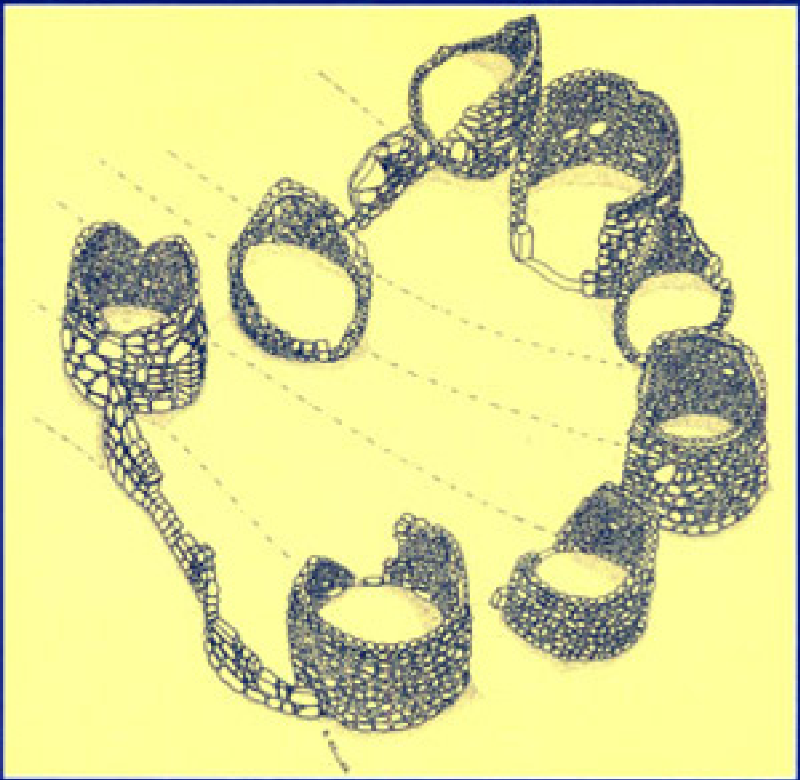
Empire and Domestic Economy



Terence N. D'Altroy
Christine A. Hastorf

Empire and Domestic Economy

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Empire and Domestic Economy

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Foreword

We are both immensely pleased to have played supporting roles in the archaeological research that led to this volume. As a faculty member at the Universidad del Centro (Huancayo) in the 1960s and later at the Universidad Nacional de San Marcos (Lima), Matos Mendieta developed a special interest in the Upper Mantaro and adjacent Tarma drainages, and during the 1960s and 1970s, he carried out general reconnaissance and several excavations in the area between Lake Junín and Huancayo. Matos Mendieta began his field research in the *Sierra Central* as part of the "Proyecto Andino de Estudios Arqueológicos" sponsored by the Smithsonian Institution. As a fellow at the Smithsonian Institution in the mid-1960s, Matos Mendieta began to interact more closely with North American scholars; during this period, he began to encourage and facilitate the interests of several US.-based archaeologists in the Peruvian *Sierra Central,* including Craig Morris, John Murra, and Donald Thompson, who were beginning fieldwork at and around the Inka provincial center of Huanuco Pampa north of Lake Junín, and David Browman, who in 1969 carried out one of the very first systematic archaeological surveys in highland Peru over parts of the main Mantaro Valley between Huancayo and Jauja.

In 1968 Matos Mendieta invited Kent Flannery to visit the known preceramic sites in the Mantaro Valley and the Junín *puna;* this led directly to their collaboration in the analysis of faunal remains from preceramic cave sites in the Junín *puna* (Flannery, 1975) and to Flannery's subsequent study of modern camelid pastoralists in the Ayacucho puna farther south (Flannery, Marcus, and Reynolds, 1989). This association between Matos Mendieta and Flannery produced a round of new investigations of Archaic rockshelter sites in the Junín *puna* during the 1970s and a series of articles, theses, and dissertations appeared over the next few years (e.g., Hurtado de Mendoza, 1971; Kaulicke, 1981; Lavallée and Julien, 1975; Morales, 1977; Rick, 1980; Wheeler, 1975; Pires-Ferreira, J., Pires-Ferreira, E., and Kaulicke, 1976). That same period in the Junín *puna* witnessed the beginning of paleoclimatic and geomorphological studies by Herbert Wright and John Bradbury (Wright and Bradbury, 1975) as well as studies of human biological adaptation to high altitude by Roberto Frisancho and his students (Frisancho, Borkan, and Klayman, 1975).

Beginning in the early 1960s, Parsons's interests focused on settlement pattern studies in the Valley of Mexico, where he was influenced by the regional and ecological orientation of William Sanders, a former student of Gordon Willey. Sanders and Parsons collaborated in settlement pattern surveys in Mexico throughout the 1960s and early 1970s. Terence D'Altroy participated in two of these field seasons, in 1972 and 1973, as an undergraduate student at the University of Michigan. Matos Mendieta and Parsons first met in 1967 during Matos Mendieta's visit to Mexico. At that time, Parsons was conducting surveys a few dozen kilometers east of Mexico City and Matos Mendieta was able to take part in that fieldwork. Here Matos Mendieta acquired a serious interest in systematic regional survey and Parsons became more fully aware of the possibilities of Andean field research.

In 1974 Matos Mendieta and Parsons together visited the area between Cerro de Pasco, Tarma, and Huancayo, examining many of the archaeological sites that Matos Mendieta had previously located and studied. It was during this tour that a general plan was formulated for a systematic regional survey in Junín: Matos Mendieta felt that such a project was an essential component of long-term research in the Peruvian *Sierra Central,* and Parsons was eager to begin developing a regional Andean data set that could serve as a basis for making general comparisons between pre-Hispanic cultural development in Mesoamerica and the Central Andes. This survey project was carried out over an eleven-month period in two field seasons during 1975 and 1976.

Timothy Earle was a graduate student at the University of Michigan in the late 1960s and early 1970s. As an undergraduate student at Harvard in the mid-1960s, Earle had worked in the Lurin Valley on the Peruvian central Coast in a survey project directed by Thomas Patterson. Following his dissertation research in Hawaii, Earle's interests gravitated back to the Andes after the mid-1970s. Early in 1977, Earle and Parsons spent several days in Ann Arbor going over the field notes from Parsons's recently completed Junín survey. They agreed that a logical next research effort would be for Earle to build on the established regional foundation in part of the survey area and move forward from there to undertake more intensive investigations that would seriously address important questions about long-term cultural change in the region. Earle's project (Upper Mantaro Archaeological Research Project) got underway the following year and continued, with varied assistance and encouragement from Matos Mendieta, for several highly productive field seasons through 1986, when the study area became too insecure for further fieldwork.

More than a quarter century has now passed since Matos Mendieta and Parsons first talked about the possibility of their research collaboration in Junín and since Browman first demonstrated that systematic regional survey was feasible and productive in the main Mantaro Valley. UMARP's efforts in the intervening years have produced some ofthe most important new data and interpretations in contemporary Andean archaeology; clearly, more is still to come. The articles in this volume and in numerous other UMARP project reports have helped develop innovative approaches and set new standards in Andean archaeology in terms of research design, sampling strategy, data recovery, faunal and floral analyses, ethnoarchaeological study, ecological perspectives, materials analysis, and ethnohistoric–archaeological interfacing. Their contributions to the understanding of prehistoric Andean economy and polity are truly outstanding.

Perhaps the project's paramount achievement has been twofold: (1) the development of a multistage research design that produced a varied database adequate to address multifaceted and complex problems at the household, settlement, community, regional, and interregional levels of analysis; and (2) the effective operationalization of anthropological theory in an archaeological context and the clear demonstration of the importance in archaeological research of the creative interplay between theory and substance. Their achievement is such that their work must be taken seriously even by those who may disagree with its orientation, focus, or interpretations; that its substance will endure and can serve as a testing ground for new and different ideas well into the future; that it serves as a model for future work in other areas and as a foundation for new work in the Upper Mantaro itself; and finally, that it appeals so strongly not only to Andeanists but also to scholars interested in the dynamics of prehistoric change all over the world. Our own claim to a small share of this achievement would be to emphasize that it was necessary for Earle and his collaborators to have a systematically defined regional context *at the outset* oftheir investigations; without that, they simply could not have proceeded with anything approaching the success, productivity, and credibility that has characterized their work.

We might cite two specific UMARP contributions, as examples of many others, that have underwritten significant advances in archaeological interpretation. First is the refinement of the local Late Intermediate Period and Late Horizon ceramic sequence into three well-defined phases—Wanka I, II, and III. This has made it possible to disentangle reliably and consistently three very distinct developmental eras and to comprehend, at least in general outline, the complex processes that transformed smaller polities into larger ones. Second is their control of the spatial and temporal variability in architectural and architectonic detail such that good inferences can be made about the social status and activities of the people who occupied different structures in different times and different places. This accomplishment depends greatly, of course, on the remarkable superficial preservation of late prehistoric stone architecture. Nevertheless, it was only through careful selection of site areas for testing and detailed mapping that it was possible to work out the full range of architectonic variation and to relate this to other categories of archaeological variability.

One important function of a work such as this is to suggest the most promising directions for future investigation by calling attention to incomplete knowledge. One example would be the still relatively limited information about the pastoral component of the Mantaro economy, both past and present. Our own 1975–1976 survey in the main Mantaro Valley penetrated only into the edges of the high *puna* grasslands bordering the valley to the north and south. The UMARP investigations subsequently focused almost exclusively on the north side of the main valley floor and its immediate borders—areas of very predominantly agricultural economy. Our archaeological survey in the adjacent Tarama–Chinchaycocha region a few dozen kilometers to the northwest (Parsons, Hasting, and Matos Mendieta, 1997, 2000) suggests, as do many ethnohistoric and ethnographic studies, that changing relationships between *puna* herders and *kichwa* (valley) agriculturalists may have played key roles in long-term organizational change in highland Peru. Expanded surveys into the domain of ancient and modern herders in higher ground bordering the main Mantaro Valley should be equally productive of new insights into the nature of Wanka I, II, and III polity and economy.

It is also important to emphasize the rich and still largely untapped ethnographic resources of the Mantaro Valley that offer great potential for archaeological interpretation. UMARP investigators have made important contributions to the ethnoarchaeological study of modern pottery production, but many other contemporary cultural patterns with strong pre-Hispanic links persist in the region: for example, premonetary exchange systems, including networks of tambos that facilitate the movement of people who transport and redistribute goods and services between communities; agricultural terraces that maintain high productivity without the use of chemical fertilizers; the daily use of the traditional implements such as the *chaki-tajlla* (foot plow) and the backstrap loom; and premodern household cooking and fuel management systems.

Wanka I—and even Wanka II—polities will remain inadequately comprehended until more is understood about the nature of the antecedent Middle Horizon in the main Mantaro Valley. This was precisely what UMARP was beginning to turn to at the point, in 1986, when it became too dangerous to continue fieldwork. Are Wanka I and Wanka II polities best understood, as has been suggested or implied by most UMARP investigators, as corresponding to something like relatively simple (Wanka I) and relatively complex (Wanka 11) chiefdoms? Or will it be necessary to consider more fully how the inhabitants of the main Mantaro Valley may have been directly, or indirectly, linked to the Wari state, whose capital was only about 150 kilometers distant? A possible scenario might be that Wanka I represents the disarticulated remnants of a collapsed state organization—a situation for which a chiefdom model may not be closely applicable. There are certainly no obvious archaeological signs that the UMARP study area was a Wari administrative province during the Middle Horizon. Nevertheless, there is a major Wari-related site (Wari-Willka, an installation of still uncertain function, although it is usually considered a "temple" or "shrine") only a few dozen kilometers to the southeast near the modern town of Huancayo (Matos Mendieta, 1968; Shea, 1969). Like the Inka in many parts of their empire, Wari influence may have been subtly enough manifested in material terms such that it will require intensive and persistent archaeological investigation to detect and define it adequately.

In a different vein, other investigators working in the Mantaro Valley might one day want to modify an interpretive orientation that emphasizes a from-the-top-down perspective in its view of lnka impact. Such a perspective generally predominates in studies of Inka imperial organization throughout the Andes, yet several recent studies (e.g., Hayashida, 1995) suggest that it may be necessary to think more about the interests, priorities, and power of local elites, artisans, labor forces, and organizational structures that interacted with the imperial lnka more in the active than in the passive sense. The notable success of the Spanish in recruiting some disaffected Wanka factions to their cause in 1532–1533 (Espinoza Soriano, 1971) is suggestive of the continuing power and influence of local Wanka elites even two generations after initial Inka "conquest." Some future scholar might also want to reexamine D'Altroy's view in this work that "the Inka resettled much of the populace into lower-elevation, more open settlements," so as to recast it more as a process set in motion by local authorities in order to take advantage of new opportunities for their own wealth generation and prestige enhancement afforded by Inka-imposed peace and Inka interest in higher maize production.

UMARP investigations have provided great insight into Inka imperial strategies and tactics, but it is worth pointing out that these perspectives derive almost exclusively from the north side of the Mantaro Valley. Future archaeological studies should keep in mind that the nature ofthe lnka impact and interaction remains virtually unknown from the still largely unexplored southern side of the valley, where a handful of known sites (such as the Acostambo center and the *qollqas* at Pucará) indicate strong lnkaic influence—an influence that may not have been isomorphic with that exhibited on the valley's north side. Equally important in this regard is the need for renewed attention to understudied local archives throughout the *Sierra Central*—such as the investigation undertaken recently in Tarma by Carmen Arellano (1994)—that offer such great potential for the definition of local groups and their interactions with lnka and Spanish authorities.

One of the great strengths of the UMARP contribution is that new ideas or different views can often be evaluated using the UMARP database. Alternatively, should this database prove inadequate for such a purpose, the well-explicated UMARP research design can often clearly suggest the best ways to generate the necessary new field data.

As we noted earlier, a notable UMARP contribution has been the use of well-preserved stone architecture to make important inferences about function and status. A major effort was made to make detailed architectural plans and to use these to design further testing operations involving both excavation and surface collection. These efforts should be emulated and expanded by others; in particular, we call attention to the vast, mostly untapped wealth of superficially well-preserved architectural remains that characterize late pre-Hispanic sites (and some earlier ones as well) throughout the central Andes. Recent advances in laser mapping instruments and geographical positioning systems (GPS) devices greatly reduce the time necessary for making accurate and detailed maps of ancient architecture. We urge Andean archaeologists to build on the UMARP lead and make use of this new technology in new mapping projects while the great resource of ancient surface architecture still remains relatively intact throughout such a large region.

In summary, the chapters in this collection, together with other UMARP contributions, help establish a whole new level of expectation about the quality of Andean archaeological research. They follow the lead ofearlier investigators and build firmly on these foundations; they greatly expand the corpus of available data and ideas; they clearly illuminate some of the best pathways for future Andean archaeological research; and they will help interest many non-Andeanists in the theory and substance of Andean archaeology.

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Preface

> The villages were made up of neighborhoods, [with houses] like forts made of stone, that seemed like little towers, wide at the base and narrow in the upper part. . . . And walking along the royal highway, . . . one can see certain very ancient buildings, all undone and torn down, on the mountaintops that surround the valley. . . , In all these parts there were great lodgings of the Inkas, although the principal ones were at the beginning of the valley in the part they call Xauxa, because there was a large enclosure, where there were strong and very excellent stone lodgings, and a house of women of the Sun, and a very rich temple, and many storage structures full of all the things that could be had.—Pedro Cieza de León[1]

> This city [Cuzco] is the greatest and finest ever seen in this country or anywhere in the Indies. We can assure Your Majesty that it is so beautiful and has such fine buildings that it would be remarkable even in Spain.—Pedro Pizarro[2]

In these phrases, the first European witnesses captured images of life in native America's grandest empire—bucolic peasant villages, a provincial center that presided over state affairs, and the Inka capital with its splendid palaces, temples, and artistry. For centuries, adventurers and scholars alike have been captivated by the upper tiers of the empire, especially the life and times of royalty. Drawing from a Cuzco-centered viewpoint, they wrote that *Tuwantinsuyu*—"The Four Parts Together"—was a powerful monarchy in which the mummies of long-dead kings and queens participated in lnka politics, ceremony, and social life through cults staffed by their descendants. Eyewitnesses described the empire as a neatly structured society that was ruled according to uniform, if sometimes diabolically inspired, customs. In the self-promoted view of Cuzco's royal kin, the Inkas had created social order from chaos and nothing was too slight to escape their interest. The myriad ethnic groups found in the empire adopted Inka customs into their daily lives and fulfilled state needs through a rotating labor tax applied to individual households, while local lords learned Quechua as the language of public affairs.

There is much truth to this vision but the order and eccentricities that permeated Inka rule have long overshadowed the lives of the diverse peoples who inhabited Tawantinsuyu. The domain outside the Inka heartland was a cultural mosaic made up of hundreds of local societies, each with its own history and nature. Many had economies and cultures similar to those of the Inkas, but Tawantinsuyu took in everything from forest villages to the Chimu Empire. Without downplaying the changes imposed by Cuzco, numerous scholars point out that the Inkas often based their policies on existing local relations or past Andean statecraft

[1] Cieza de León (1984:242–243, 245).

[2] Cabildo of Jauja, cited in Hemming (1970:120).

(e.g., Murra, 1980; Schreiber, 1987). And while it may be true that the Inkas remade the ethnic landscape by resettling millions of subjects and imposed new burdens on the taxpaying populace, they often tried to mask the changes by pretending that the new policies were simple extensions of time-honored relations, many of which continued uninterrupted. Even with their duties for the state, householders spent most of their time in commonplace activities revolving around family and community. Overall, the rhythm of daily life in many areas owed as least as much, if not more, to existing conventions and local relations as to dictates from above.

This communal focus defined the character of Andean life in the last centuries before the Spanish invasion of 1532 and for decades thereafter. When the Inka expansion began in the early fifteenth century A.D., a few communities or a regional polity formed the most extensive political or economic unit in much of the highlands. Most societies did not have a market system, state taxation, a temple economy, or any other institution that would allow the Inkas to divert easily the products of their labor to Cuzco's ends. The Inkas did not have a large urban population to support in Cuzco nor could they move bulk goods across great distances as part of a subsistence system. That situation contrasted with other early empires, such as the Aztecs or Romans, where urban economies drew support from specialized or market-oriented regional economies whose production was channeled to sustain a large civil population, the aristocracy, or both.

Under the circumstances, study of local communities before and under Inka rule has a great deal to contribute to our comparative understanding of preindustrial society. The authors in this volume take on that challenge, using archaeology complemented by written sources and ethnography to examine daily life in Peru's Upper Mantaro Valley. This valley—the same described in the opening quotation by the soldier Cieza de León—was a rich farming and pastoral region. It was home to the populous Xauxa and Wanka societies that built some of Peru's largest towns during the thirteenth and fourteenth centuries A.D., a few of them almost surely the ruins that Cieza de León saw. Under the Inka kings in the fifteenth and sixteenth centuries, the valley's inhabitants became favored subjects, enjoying some privileges of status while they served their Cuzqueñan lords.

The authors here draw from more than a decade's research by UMARP to provide a window into those times before Francisco Pizarro's invasion interrupted the autonomous flow of Andean history. Studying the shift from community independence to subordination was a complex task because we had to investigate simultaneously the household, the community, and the imperial province. The work was initially made possible by the generous sharing of field survey data by the authors of the Foreword, Jeffrey Parsons and Ramiro Matos Mendieta, and their colleague Charles Hastings. UMARP began its studies in 1977 and worked in the field until the Shining Path insurgency made further study untenable in 1988. The research included a nested series of projects designed to examine (1) the relations among warfare, demography, and community organization in the formation of political hierarchies; (2) changes in agriculture and craft production from independent to imperial contexts; and (3) the nature of Inka rule. The fieldwork entailed intensive surface surveys and chronological refinement, study of modern land use practices, extensive excavations, and reference to early written sources. Overall, UMARP recorded information on more than 300 archaeological sites, the largest of which contained about 4,500 buildings and may have housed over 10,000 people. As the data analysis continued beyond the fieldwork, the authors began to pose a new set of questions, such as how the lives of men and women complemented one another or were differently affected by imperial incorporation. We were fortunate in that the data collected allowed this book's authors to continue to address some of their unfolding research interests.

This volume—the synthetic capstone to our project on local communities—is organized into three parts. In the first, the authors discuss how UMARP's study of the household was conceived theoretically and carried out in practice. It continues with portraits of the social and natural context of life in the Upper Mantaro, drawing on environmental, ethnographic, and historical sources. The second part describes the Xauxa's household activities through study of architecture and community planning, agriculture, use of faunal resources, ceramic production and use, metals and shell adornments, and regional exchange. The final section draws the information together to draw pictures of life before and under Inka rule. By the end, we hope that it will be apparent that the Xauxa were an autonomous people before the Inkas took over their valley and maintained that identity through imperial Inka rule and into the hispanic centuries that followed. This volume is part of an effort to understand their lives.

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Acknowledgments

This volume is the product of over a decade's efforts by a large group of researchers working under the UMARP umbrella. The principal authors of this work, which represents only part of the research by project members, would like to acknowledge the enormous debt of gratitude that UMARP owes to the individuals and communities that supported or participated in our research, as well as to the governmental and private agencies that underwrote its completion and publication. Our first acknowledgment must go to the people of Peru who facilitated the study reported here. We owe a special debt to Ramiro Matos Mendieta, who introduced us to the archaeology of the valley and has been an unfailing friend of scholars working in the central Andes. Without his pioneering work as Director of the Junín Project and his shared knowledge of the region's prehistory, we could not have undertaken this research. Jorge Silva S. also deserves particular mention for his years of close work with UMARP and help over many an archaeological and administrative hurdle. The people of the valley made us feel welcome, especially Sr. Miguel Martinez and his family, who were our gracious landlords and dear friends in Jauja. Our heartfelt appreciation also goes to Andrés Moya, his wife Faustina Yachachin Moya, and their family. Andrés arranged for and managed the field crew and Faustina looked after us in our home, while their son José became an accomplished excavator. Many other people from Ataura worked with us, amazing us with their strength and patience in both the field and laboratory: Cirlio Arellano, Martin Casas, Alex Castro, Juan de la Cruz, Victor Esteban, Grimaldo Flores, Carlos Guerra, Zósimo Llanto, Teodoro Marticoreno, Miguel Mateo, Hector Moya, Jorge Neyra, and César Soto. Special thanks also go to the citizens of Jauja, Ataura, Sausa, Pancan, Marco, Concho, Tragadero, and Yanamarca for allowing extended fieldwork on their lands. Throughout its research, UMARP worked under the auspices of the Instituto Nacional de Cultura, which both supervised and collaborated with the project. We would particularly like to recognize the support lent by Dra. Isabel Flores.

Foremost among our colleagues from the United States is Jeffrey Parsons, who has been the most giving scholar and friend imaginable. Ramiro, Jeff, and Chuck Hastings provided UMARP with full access to their field notes, collections, and transport. Since they had completed a survey of UMARP's study area, their generosity allowed us to address research questions that otherwise would have been beyond our reach. One of UMARP's parents is missing from the list of authors—Cathy Scott. An original codirector, Cathy has been a delightful friend and colleague. Her closely thought out ideas permeate this text, whether in the chronology used in our work, the pre-Inka settlement pattern study, or the design of the present work. Among UMARP's other fine colleagues upon whose work we draw here are Glenn Russell, Terry LeVine, and Melissa Hagstrum whose studies provided crucial insight into lithic industries, Inka administration, and modern craft production.

The principal authors would also like to express particular thanks to Tim Earle, whose chapter on exchange represents only a fraction of his contributions both to the present volume and to the lives of its authors. As the founder of UMARP and its director our doctoral studies. Many of the chapters in this work are outgrowths of our doctoral research and Tim can claim a considerable measure of the credit for the entire work.

Many students and colleagues worked for months in the field and the laboratory with little financial support. The research that led to the publication of this volume has been accomplished only through their energies and special skills, and many of the ideas presented here arose from their insightful observations. From Peru, Cristina Baltazar, Enrique Bragayrac, Antonio Cornejo, Carlos Elera, Manuel Escobedo, Rubén Garcia, Beatriz Miyashiro, Virginia Peláez, Carmen Thays, Humberto Vega, and Moisés Vergara were first-class participants. Colleagues and students from the United States, England, and Australia included David Bulbeck, Andrew Christensen, Bruce Crespin, Jim Fenton, Anabel Ford, Patricia Gilman, ElizabethHart, David Hearst, Lisa LeCount, Banks Leonard, Sarah Massey, Marilyn Norconk, Bruce Owen, and Elzbieta Zechenter.

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Part I

Investigating the Domestic Economy

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Chapter 1

The Domestic Economy, Households, and Imperial Transformation

Christine A. Hastorf and Terence N. D'Altroy

INTRODUCTION

In 1532, when the Spanish conquistadores ascended the Peruvian Andes from coastal Tumbes, they entered a part of the world that seemed utterly foreign to them. Although many of the venturers had participated in the conquest of Mexico, the Andean environment, cultures, languages, and social formations presented a marvelous new set of curiosities and, more to the point, untold wealth and souls to save. The more perceptive Spaniards soon began to grasp that the land that they had invaded had been undergoing profound changes, as the lnkas of Peru's southern highlands had created the largest empire in the prehistoric Americas in the preceding century. It was not clear at the time, however, how much of what the Europeans encountered was a product of long-established tradition and how much was radically new.

Almost five centuries later, explaining the development of indigenous social and economic formations and the impacts of the lnka conquest remains a challenging topic of research. This volume addresses that issue by studying continuity and change in the domestic economy of one Andean society—the Xauxa populace of the Upper Mantaro Valley, in the central Peruvian highlands. Our goal is to assess the nature of economics at the household level, as the region's populace shifted from a series of independent polities to part of an imperial state. We know that during the first period we investigate (ca. A.D. 1300–1450), the Xauxa were becoming increasingly complex politically and economically, largely as a result of local interactions. In the second period (A.D. 1450–1533), the Xauxa and their neighbors were forcibly incorporated into the Inka empire. As a consequence, political power became markedly more centralized and the political economy more extractive.

In analyzing both the pre-Inka and imperial situations, the authors focus on the internal dynamics and the external links of production, distribution, and consumption. Although the book's orientation toward the domestic world of these people is an economic, material view of daily life, we hope to gain a broader cultural perspective by weaving together many cultural strands arising from diverse behaviors. We also hope to advance new perspectives on the study of the household and the domestic economy in archaeology. We chose to focus on this subset of society because it is the smallest social unit that we can see archaeologically, and because at that level of organization we begin to sense the dynamics of daily life that the Xauxa people experienced.

At the outset, we would like to distinguish the domestic economy from the political economy, which is concerned with the production and distribution of goods and rendering of services in societal integration above the family. Because the more easily visible economy of surplus production and expansion has been the usual focus of economic analyses of the state, we will leave that topic to other studies except where there were direct consequences for the domestic economy.

Instead we are concerned with the changes in daily life that came about when the Xauxa people were incorporated into a political system that was greater in scale and focused on relationships external to the Xauxa. This challenging task requires that we study activities associated with organizations of markedly distinct complexities and scales that do not always sort out neatly. In the lnka state, as elsewhere, people participated in both the domestic and political economies simultaneously, often in their home communities and own households. Evidence for the political economy consequently may be found in domestic contexts, just as evidence for domestic activities may sometimes be recovered from situations that existed on a larger political scale. It will therefore be worth some initial effort to describe the theoretical and empirical contexts within which our study has been conducted.

Family and household economics have long been important to anthropology in both ethnographic case studies and comparative research (e.g., Goody, 1972; Laslett and Wall, 1972). More recent investigators have reevaluated the nature of the household, shifting away from kin-based, normative conceptions toward more behavioral and activity-based analyses (e.g., Netting, Wilk, and Arnold, 1984; Maclachlan, 1987). This shift has been paralleled by an increasing archaeological interest in the household economies of prehistoric societies, which are methodologically more amenable to analyses of activities than to study of broader institutions or social structures (e.g., Wilk and Rathje, 1982; Hayden and Cannon, 1983, 1984; Brumfiel, 1987a, 1987b; Smith, 1987; Wilk and Ashmore, 1988; MacEachern, Archer, and Garvin, 1989; Stanish, 1989).

We have chosen two highly charged political situations within which to study the household, in part because the more stratified organizations have not been investigated at this scale as often as simpler groups. The analyses of the economy in larger societies tend to examine problems such as the control of prestige goods production and circulation (Earle, 1978), control of exchange networks and elite knowledge (Helms, 1979), or peer polity political interaction (Renfrew and Cherry, 1986). Such models provide useful insights but they do not look at the operations of families and actions in daily life in enough detail to explain how society works in everyday existence, how political issues are played out among household residents. For that purpose, archaeologists are benefiting from the social theories that deal with action by individuals and family groups, such as Giddens's (1979, 1984) theory of agency and structuration, and Bourdieu's (1977) practice theory. With such a theoretical basis, we will be able to look at issues surrounding the daily pressures and decisions within the domestic life and how these change along with major political transformation.

The formation of early empires has been an interest of historical and archaeological research for decades, but investigators have shown a renewed interest in workings of these expansionist polities over the past two decades (e.g., Adams, 1981 ; Collier, Rosaldo, and Wirth, 1982; Schacht, 1987; Wenke, 1987). Archaeologists have found a variety of explanatory models to be useful, among them the world systems (Wallerstein, 1974; Schortman and Urban, 1987; Chase-Dunn and Hall, 1991), core–periphery (Rowlands, Larsen, and Kristiansen, 1987; Champion, 1989a), and hegemonic–territorial models (Luttwak, 1976; Hassig, 1985, 1988; D'Altroy, 1992). Coupled with anthropological evaluation of polities most frequently examined from historical standpoints, these works provide comparative views on early and non-Western expansionist societies (see also Wolf, 1982).

The relationships between these two different scales of sociopolitical life—the household and the empire—have been explored only nominally in prehistory, and we hope that examining the Xauxa case will provide insight into this issue. Most of the detailed data in this volume derive from the 1982–1983 field seasons of the Upper Mantaro Archaeological Research Project's (hereafter UMARP) study of the relationship between politics and economics in Peru's central sierra during late prehistory (e.g., Earle *et al.,* 1980a, 1980b, 1987; Hastorf *et al.,* 1989). We would like to emphasize, however, that this work draws on more than a decade's study by several teams of scholars into the prehistory of the region, most notably the Junín Project (Preface, this volume; Matos Mendieta, 1975; Parsons, 1976; Parsons and Hastings, 1977; Matos Mendieta and Parsons, 1979; Parsons, Hastings, and Matos Mendieta, 2000).

From detailed site surveys and excavations, we have learned that, from ca. A.D. 1000 on, the Upper Mantaro societies had begun to develop increasingly visible social interactions in the forms of population aggregation, agricultural intensification, urbanization, and sociopolitical differentiation. Especially in the last 100–150 years prior to the Inka conquest, these people appear to have intensified intercommunity alliances in a climate of pervasive, if sporadic, warfare. Although there was some degree of community specialization in the production of certain goods, such as textiles and ceramics (Costin, Chapter 9, this volume), the economy of the local settlements was generalized, taking advantage of the varied agricultural, pastoral, and geological resources of the region (Hastorf, Chapter 7, and Sandefur, Chapter 8, this volume).

The Inkas began their conquest of the Andes early in the fifteenth century, from their home in the Cuzco basin of the southern Peruvian sierra. By 1532, when the Spaniards invaded, the Inka had asserted dominion, with varying degrees of intensity, over more than eighty historically recorded ethnic groups totaling perhaps 10,000,000–12,000,000 people. Documentary sources and archaeological research indicate that the imposition of Inka rule had significant impacts on the economy of many subject societies (e.g., Murra, 1975,1980). New labor taxes, agricultural restructuring, appropriation of resources, formation of specialized production groups, and resettlement programs combined with other state policies to alter regional politics and economies. Because the Inkas depended heavily on the capacities of a largely self-sufficient peasantry for both services and productive labor, however, many aspects of the community and domestic economies of subject groups appear to have been left at least partially intact.

The Upper Mantaro region was conquered by the Inkas during the early phases of imperial expansion, about 1430. One of the most populous Inka provinces, *Wanka Wamani* (the Upper Mantaro region) was markedly altered during the Inka era, here called Wanka III (A.D. 1430–1533). The populace largely moved out of the high-elevation, fortified, Wanka II settlements down to more dispersed, smaller settlements under Inka rule (see Chapter 4). This resettlement was coupled with the construction of major state facilities, most notably the provincial center of Hatun Xauxa and the largest concentration of storage buildings known in the empire. One result of the move by the native people was a shift from environmental zones most suited to a tuber farming–pastoral mix into areas conducive to cultivating all highland crops. In the process, the Xauxa communities became more accessible as they vacated their defensive citadels for many smaller, more open villages. We do not yet know to what degree this movement into the valleys resulted from the peace the Inkas imposed, allowing the populace to reoccupy their valley lands, or from enforced resettlement by the Inka, which was intended to control the Xauxa better (Hastorf, 1990a).

The invading Spanish forces reached the Upper Mantaro Valley in 1533, just after the populace had been subdued by the armies of emperor Atawallpa, who had defeated his brother Waskhar in a conflict over succession to the throne. Having fought on the losing side, and facing the prospect of brutal retribution, the Upper Mantaro population aided the Spaniards in their wars of conquest (Espinoza Soriano, 197 1). The Spaniards took advantage of this relationship, establishing in 1535 the first South American capital, Jauja, nearby the Inka tampu of Hatun Xauxa.

In this chapter, we would like first to set out the theoretical positions from which the authors analyze the Xauxa domestic economy. This discussion is elaborated in Chapter 2, where the 1982–1983 domestic economy project design and specific research problems are described in detail. Although UMARP's research was conducted by a collaborative team working from a coordinated design, we do not all share identical theoretical perspectives or analytic emphases, as will become evident in the following chapters. We consider these differences to be a strength even though at times we may arrive at diverging conclusions on the nature of the society and its economic processes. We hope that a thorough presentation of the data will permit readers to evaluate independently the sometimes differing views expressed by the contributors to the volume. Second, we outline our understanding of the domestic economy vis-a-vis households and regional politics in anthropological and archaeological perspectives. Our attention then shifts to models of imperial organization and, finally, to an examination of kinds of linkages that we expect between imperial rule and the domestic economy in the Inka situation.

THE DOMESTIC ECONOMY IN ANTHROPOLOGY

The concepts of the *domestic economy* and the *household,* like many standard parts of the anthropological lexicon, have distinct meanings for different researchers. Although the concept was originally described by Polanyi (1957) under his term *householding,* the anthropological literature has been implicitly using Chayanov's (1966) vision of the domestic economy, which focuses on the unit of production, where no land scarcity exists. In this volume, we consider the domestic economy to entail the production, distribution, and consumption of goods; resource ownership or access; the provisioning of services; and the organization of labor at the household or family level.

The extensive literature in anthropology on the domestic economy tends to draw on Sahlins's (1972) influential reworking of this production-oriented approach, which he termed the *domestic mode of production* (DMP). In Sahlins's model, the household is the primary economic unit in a marketless society. It is generalized and self-sufficient, producing and consuming the goods it needs for its existence and reproduction. Although the DMP remains influential in studies of household economics, some of its central premises have come under theoretical and empirical scrutiny (e.g., Harris, 1983; Netting, Wilk, and Arnould, 1984; Johnson and Earle, 1987; Moore, 1988; Wilk, 1989a, 1989b). Among other things, the DMP model tends to focus on the household as an immutable unit. It downplays tensions between the interests and activities of members that crosscut households and glosses over different ways that household members are linked to other groups, such as gender, age classes, lineages, communities, or political institutions. The DMP model further ignores evidence that many households do not pool their produce (Harris, 1983, Hartmann, 1981; Netting, 1968; Wilk, 1989a).

More recent domestic economy studies have focused analytical attention on the individual, highlighting the differences between male and female, old and young, goals concerning household activities, access to resources, and status (Hartmann, 1981; Kahn, 1986; Lockwood, 1989; Moore, 1986; Weismantel, 1989; Wilk, 1990a). Many of these studies demonstrate how ownership and distribution of goods do not operate at the household level but are often based on individual status, gender, age, and kinship. These individual decision makers exist within every household, which is why it has been possible to discuss the household as an operational unit. Closer study, however, shows that these decisions combine differing individual or lineage goals.

An Andean example of this is seen in the traditional parallel inheritance pattern that existed in much of the Andes before the Spanish reworked the rules of inheritance of goods and access to productive resources. Historical evidence suggests that animals and land used to be inherited along gender lines, women passing their portable holdings to their female children, while men bequeathed their land to male offspring (Lambert, 1977:1; Silverblatt, 1987). This pattern changed with the westernization of Andean law and the bilateral inheritance system in which all siblings inherit a share of the pooled resources of the parents. The parallel inheritance system creates a social dynamic different from that found in the bilateral system. Lambert (1977) points out that this shift weakened the suprahousehold *ayllu* unit while strengthening the individual familial unit. Such a shift would surely have had an impact on daily interactions and sharing of familial resources in Colonial times.

Sahlins (1972:196) further argues that members of the household in DMP-based societies act altruistically, making decisions to benefit the group as a whole as they pool their produce. Altruism has not been found in a wide range of research on production within household units, however. Netting's Kofyar research shows how women and men have different agricultural fields and storage, and that the men cannot enter their wives' granaries (1969). Clark similarly demonstrates how Ashanti market women keep their finances separate from the households (1989:91). In highland New Guinea, even though women feed and raise the pigs, men will give the pigs away, often without the women's consent, thus causing internal tensions (Mojeska, 1982). There also women have started their own banking system to keep their production independent of their husbands (Sexton, 1982). Although some aspects of production are not pooled, others are, including jointly owned animals received at marriage. These examples suggest that we must think through how much we can use the idea of pooling produce for each particular cultural situation and at what level we should envision such pooling.

The domestic economic model must also be reconsidered in the realm of consumption (Rutz and Orlove, 1989). The concept of communal pooling and redistribution may work well in many cultural groups but it cannot be assumed to be universal. Separating consumption and processing activities from production provides us with a more realistic and dynamic picture of the fluid domestic unit. In some ways the act of consumption is perhaps most revealing in the domestic economy. Because it is often publicly performed, consumption of food and goods perpetuates the politics of use and exchange of goods (Douglas and lsherwood, 1979; Orlove and Rutz, 1989:14). It is also social relations made material. Acts of consumption, from the daily meal to interfamily exchange or public ritual, entail competing claims to status and power, both conflictually and consensually, as well as showing social position symbolically and materially (Douglas, 1966; Mintz, 1985; Giddens, 1979).

Consumption is also firmly tied to reciprocity, redistribution, and exchange. The acts of consumption provide us with the potential to uncover socially and culturally constructed meanings. These intentions are important to archaeologists' concepts of past economies because the archaeological record often provides us with the discard of consumptive activities. In fact, a focus on consumption, especially at the household level, should force us to get at the underlying levels of meaning as well as processes behind economic actions, because consumption is the end result of all productive activities. It is constituted in socially defined contexts and is the ultimate point of the whole economic cycle (Giddens, 1979; Orlove and Rutz, 1989). Through consumption we can see the dynamics of wealth, power, and decision making within households as well as stratification within communities.

Consumption also bridges the domestic economy with the political economy. Its study requires the investigator to examine the social context of the use of objects and to assume that "economic action is at least partially social action; individuals are involved in face-to-face relations which influence, and are influenced by, their ties in activities of production, exchange, and consumption" (Orlove and Rutz, 1989:18). In an example of the social economy of consumption, we see in the Andes today that, even though fields are considered the male domain, once the harvest reaches the household's storage rooms, it becomes the domain of the female. It is she who agrees to sell or to trade the crops and decides what is eaten and by whom. Therefore, what often are considered "economic" consumption decisions within these households are strongly culturally constituted and made along gender lines.

Gender is also pivotal in making decisions about the distribution of labor. Although today in the Andes activities are flexible throughout the household, the cooks are predominantly women. Because cooked food is necessary for all social, political, and ceremonial events, a male attempting to complete his political obligations must find women to provide the food as well as to prepare and serve it. Affinal women and wives, but especially consanguineal women, do not have to participate in this activity, although they often help as a group (Lambert, 1977). In the study of lnka society, in which particular kinds of resources such as high-quality foods and goods were dispensed in ceremonial hospitality to individuals rather than to families, we need to pay careful attention to such dynamics.

This social economy perspective thus dictates that output is culturally defined (Orlove and Rutz, 1989). The DMP approach presumes that most economically generalized households will behave according to a satisficing model in which the household, as an entity, will minimize the productive labor needed to achieve a culturally defined level of output, including politics or ceremonial relations (Sahlins, 1972). Kirkby (1973), for example, has argued that the prehistoric farmers of the Valley of Oaxaca consistently produced substantially less maize than the available technology, labor, and soils would have permitted. She ascribes this to an underlying satisficing approach to the allocation of household labor.

Other researchers, however, have argued that maintenance ofrelatively low productivity results not from culturally defined levels of output but from decisions based on concerns for optimization of labor input for food output, risk minimization, or maximization of minimum or average output (see Earle and Christensen, 1980; Feinman, Kowalewski, and Blanton, 1984; Halstead and O'Shea, 1989). We refer the reader to the contributions by Sikkink and Costin for some of the contrasting lines of argument for the principles underlying the domestic economy and especially its relationship to specialization. Here we simply emphasize that decisions taking into account social or political goals are not necessarily mutually exclusive with decisions that consider efficiency and risk. Cultural and energetic restrictions on labor were both important issues in past agricultural societies and surely were weighed simultaneously in each production decision.

Within all of these approaches, several issues require attention for the study of the domestic economy in prehistory. Among these are (1) the allocation of labor within the household, (2) the constraints and efficiencies of production using familial labor only or labor exchange, (3) problems of scheduling, (4) basic household subsistence needs, (5) social and cultural obligations in a wider social network outside of the household, (6) obligations accruing from the political economy, and (7) the social economy ofconsumption. This list suggests the range of conflicting demands on labor and resources facing members of a household. It points out that the relations of household members to more inclusive or crosscutting groups play a critical role in understanding household composition and activities. If we are to understand how domestic economies work, we need to try to keep in mind all of these internal dynamics and external links. We acknowledge the difficulties of this task in studying prehistory but feel that a more conscious awareness of these issues will help provide new insights into our understanding.

STUDYING THE HOUSEHOLD

The concept of the household, like the domestic economy, has come under renewed scrutiny in the last two decades. We find Netting's (1989:231; see also Wilk and Netting, 1984) concept of a household useful: "asocially recognized domestic group whose members usually share a residence and both organize and carry on a range of production, consumption, inheritance, and reproductive activities whose specific contents varies *[sic]* by society, stage in the life cycle, and economic status." This behavioral definition shifts away from analysis in terms of kin structure (e.g., Murdock, 1949; Goody, 1972; Laslett and Wall, 1972). The reorientation is deliberate among many researchers who have sought analytical categories based on how societies and their members live their activities and social relations that are independent of how they conceive them.

Within this framework, the domestic economy is a central feature of household activity but comprises only a part of the array of household actions and relationships. Some directions in household research focus on a series of related problems, including examination of the composition of households (Wilk and Netting, 1984); the concordance between the shape of the household and the activities pursued (Weismantel, 1989); the nature of decision making, especially labor scheduling and allocation of disposable resources (e.g., Wilk, 1984, 1989a); the relationship of households to larger social units, such as communities (e.g., Donley, 1982; Weismantel, 1989; MacEachern *et al.* 1989); the symbolic meanings of household form (Douglas, 1973; Hodder, 1984, 1990; Kus and Raharijaona, 1990); and variations within households, especially defined along gender lines (Bourdieu, 1973; Ardener, 1981; Harris, 1983; Moore, 1986; Poats, Schmink, and Spring, 1988). A number of studies have also begun to focus on transformations in households as a consequence of incorporation within larger economies, especially capitalist economies, as peripheries in a world system, and as participants in political economies (Smith, Wallerstein, and Evers, 1984; Orser, 1991). Although there is considerable debate over the precise concept of the household or the means by which it is constituted, transmitted, reproduced, and even where exactly households are located, these authors share the view that the household remains a useful conceptual category for certain studies. Some authors accept that it may be defined best by what it collectively does, even if the conception represents an average (see Netting, 1989; Wilk and Netting, 1984:5).

In using the concept of household, we acknowledge that any classification of human society contains exceptions. In practice, there may be problems in identifying boundaries and membership, and hiding internal distinctions, especially since some household members may reside in several locations, move fluidly among different places, or visit the home base only occasionally (see Rapp, Ross, and Bridenthal, 1979; Hammel, 1984; Schmink, 1984; Moore, 1988; Olsen, 1989; Poats, Feldstein, and Rocheleau, 1989). However, authors examining these issues have observed the frequent empirical coincidence between the anthropological and folk conceptions of the social centrality and general composition of the household (e.g., Weismantel, 1989:56). Furthermore, as Sikkink (Chapter 5) observes, contemporary Andean households are an operational unit in important cultural settings (see also Stanish, 1989). New units are formed with marriage and the beginning of a new household forms literally when houses are built (Arnold, 1992). The marriage is highly visible, with a public ritual display and much giving of goods, land, or cash from both sides (Lambert, 1977:9). We therefore recognize that any social analytic category will have general trends, variations, and exceptions, but in our analysis of Xauxa society, we find the household to be a useful category.

Although households are conceived as units for ceremonial and economic participation in the Andes today, they survive in part because of their constant and flexible interconnectedness with neighbors, *compadres* (godparents), kin, *ayllu,* and community members (Mayer, 1977). There is a great deal of labor (*ayni* and *ayuda*) and goods exchange, especially among affines who reside in different house compounds and often different villages. And while marriage itself is aprolonged situation, when a new household is finally created, there is a new productive unit. Bastien (1978) discusses one archetypal example of this situation, in which an *ayllu* is spread out over three different production zones, with people tending to marry into different zones. This practice allows one household to have land holdings in at least two zones, with kin in all three for needed exchanges with the other zones. A different type of fluidity is expressed in the situation in which families have several houses, each within a different ecological zone. It is common in this setting to have a house in the pasturelands for tending herds, one or two houses at the ecotone between the tuber and the maize-growing zones, and one house in the lowlands, where warm climate crops are grown. This scenario means that people are constantly moving from house to house and that these three places make up one household production unit. However, there are also examples in the Andes today in which there is strong moiety endogamy within villages and households are visible, economic units (Skar, 1991).

These two household types both require interhousehold help. Each household attempts to gain self-sufficiency while maintaining horizontal interaction (Belote and Belote, 1977). It is in part because of this perpetual cooperativeness between people that households exist and are so prominent today. Some scholars think that the Andean production system revolves around households because they sustain and protect villagers from outside market forces through their nonmarket, reciprocal economy (Skar, 1985; Weismantel, 1989). These interdependencies are the power behind the Andean domestic economy.

A more materialist view of the existence of households sees traditional Andean households maintained by the state system as a cheap rural labor source for the urban, irregular wage labor system (Mallon, 1983). Such market pressures encourage patriarchy as well as the nuclear family structure, with males bringing in and controlling cash, thus creating different types of inequality and tightening the access to some resources. Was this also an important factor in Inka times? In fact, this thesis leads into one of the ongoing debates within Andean studies today, that of pre-Hispanic social structure. Today, bilateral inheritance within nuclear families is most common (Lambert, 1977:1 ; Isbell, 1978; Stanish, 1989:10). Detailed study of this phenomenon, however, suggests that bilaterality was instituted by the Spaniards under Bolivian, thus forcing different patterns of inheritance and access to land (Stanish, 1989:9; La Lone, 1985). Introducing bilaterality in the Andes weakened the *ayllu,* since pressure to privatize land holdings increased under Spanish rule. This makes for a more segmented, individual perspective on society as well as increased strength for the nuclear family.

In the past, material and knowledge inheritance would have been parallel along gender lines, while the land would have returned to the *ayllu* (Zuidema, cited in Lambert, 1977:16; Belote and Belote, 1977; Silverblatt, 1987). Today, the *ayllu* seems to have less power as individuals own what once existed under group jurisdiction. Therefore, we can see how the nuclear family household has become perhaps a more independent, stronger economic entity today that it was in the past, although archaeological evidence does suggest that households existed at least since the Formative Period in the Andes.

The data on the late prehistoric period households are more scant than for the present, but it appears that sierran households drawn into the Inka state may have been more generalized in their labor organization than their modem counterparts involved in capitalist, even global, economics. From the early documentary sources, it appears that the *ayllu* formed the basic, resource-holding, corporate unit in the Peruvian sierra. The *ayllu* varied in internal complexity, size, and kin structure, but each had an internal hierarchy. Ranging from perhaps a few score households to several thousand members, the *ayllu* held lands communally, allocating them through usufruct. The basic principle underlying access to resources was that a household held rights to agricultural land, pastoral grasslands, and water through participation in the activities that maintained the group. Elite members of the community had rights to have their lands worked, herds tended, servants, and some craft products manufactured, theoretically in exchange for their labor as leaders of the community, including defending the group and organizing workparties, rituals, and feasts (Murra, 1980; Smith, 1989).

The ideal southern Peruvian Andean *ayllu* territory recorded in the early documents was one in which all basic ecological zones in the region were encompassed within lands held by the corporate group. As explicated by Murra (1972) and also illustrated in a modem setting by Bastien (1978), community members lived in several locations distributed throughout this territory, maintaining and exchanging resources internally. The principal community would normally be situated close to the ecotone between the maize- and tuber-growing zones, with satellite villages occupied elsewhere. Murra suggests that communities could also establish small settlements at points of specialized productivity, such as in zones amenable to coca cultivation or to salt collection. The best evidence for such vertical archipelagos pertains to the Lake Titicaca Lupaqa under Inka rule and southward into Bolivia (Murra, 1972; Harris, 1982).

The modem household as an economic unit revolves around its use of labor, which is divided along age and gender axes; however, any adult can do any task if needed. In general, the females are in charge of the storage, cooking, and children, while men tend to direct the farming, exchange labor, and, more often today, will leave for short lengths of time to gain seasonal paid labor. All members will participate in the harvest and whoever is free will tend the animals during the day or go for firewood.

In many situations, especially if the men do not leave for outside seasonal work, the family will be involved in part-time craft specialization. It is difficult to generalize as to gender dominance within crafts. In some areas, men dominate the production, while in others, women complete most of the work.

Today, households tend to be made up of an adult pair accompanied by their unmarried children, often with one or more adult kin or parents. This nuclear situation naturally places great pressure on the woman when the males leave for seasonal labor, since all agricultural labor and care must be completed and managed by her. It is clear that this world market strategy has placed new burdens on females within households. So, too, when a male enters the local community political system, he must himself gain help with sponsored feasts and rituals. Although he does turn to his wife for help, he must ask for her help just as he also asks for support from affines and neighbors. Sikkink's chapter discusses such dynamics of modem member participation within the household and the community.

KEY ISSUES IN HOUSEHOLD ARCHAEOLOGY

Recently, archaeologists have begun studying households as a social and analytical unit (e.g., Flannery and Winter, 1976; Gnivecki, 1987; Hayden and Cannon, 1982; Wilk and Rathje, 1982; Vogt and Leventhal, 1983; Smith, 1987; Wilk and Ashmore, 1988; Stanish, 1989; MacEachern *et al.,* 1989; for a more extended review, see Ashmore and Wilk, 1988). Household archaeology is now concentrating on a range of issues concerned with spatial distributions and activity-focused studies, and researchers are increasingly wary of accepting long-standing explanations for the relationships between material remains and social units. One such issue concerns the identification and interpretation of the material correlates of a residential household (Kent, 1984, 1987; Ashmore and Wilk, 1988:6–13). Although superficially straightforward, this is a vexing problem, since researchers grapple with varying memberships (Haviland, 1988), shifting or intermittent occupations (DeBoer, 1989; Hodder, 1982), life cycles of households and buildings (Tourtellot 1988), changing uses for architecture and enclosed space (Lavallée and Julien, 1983), and discrete activities within the houses (Flannery and Winter, 1976; Hodder 1982; Manzanilla and Barba, 1990). These studies have led to an emphasis on detailed, intrasite analysis.

Within larger societies, household analysis has often helped study transformations in the core of developing prehistoric state societies (e.g., Flannery and Marcus, 1983; Brumfel, 1991; Manzanilla and Barba, 1990). Sanders, Parsons, and Santley (1978), for example, provide an insightful assessment of changes in household composition and rank in Basin of Mexico settlements with the formation of the Classic Teotihuacan state. Their household work suggests that it is possible to recognize decreasing household self-sufficiency, increasing social ranking, and broadened linkages to regional religious and specialized economic networks as state society developed. This can be tied to the detailed studies of the internal organization of Teotihuacan itself and to the analysis of changes in kin organization, economic activities, and social class that have been the focus of household studies within the urban core (e.g., Manzanilla, 1986; Millon, 1981; Cowgill, 1983). For a later period, Brumfiel (1991) brilliantly details the changes in household activities as women adjusted their daily tasks and regular exchanges based on what was being extracted from them by the Aztec state.

A central part of this work is an effort to assess distinctions between households within state societies, primarily through differential wealth distributions. In a review article, Smith (1987:298) suggests that household wealth is related to family size and structure, the occupations of household members, and the place in the domestic developmental cycle. We would further observe that social and political position within the community should influence household wealth. Following the lead of Rathje and McGuire (1982) and Wright (1984), Smith suggests that residential architecture, burials, and portable domestic artifacts are particularly good sources of archaeological data with which to discuss stratification and wealth differentials in households. Because household artifacts especially change more rapidly than architecture (usually have a shorter life span), Smith argues that these provide the most sensitive measure of changing household wealth. His review suggests that the artifacts of greatest economic analytic utility include food preparation and serving items associated with different cuisines, religious items, nonutilitarian luxuries, and specialized artisan production tools. This last set is frequently applied to study the extent of specialists and whether they are attached or unattached to elite households. Most of these items are most illustrative of consumption patterns, again shifting the emphasis from only production.

Archaeologists often turn to historical and ethnographic studies in their region of interest to ascertain relevant historical patterns that may have links to prehistoric behaviors and meanings, as well as material correlates of living household and community organization (e.g., Kramer, 1979, 1982; Yoffee, 1979; Hodder, 1982; Wilk, 1983; DeBoer, 1989). Hayden and Cannon (1982, 1985) have shown, for example, that different kinds of household-related behavior are more readily recognized at different scales of material analysis, including those more inclusive than the single household unit. Although this research has significantly refined questions and strengthened interpretations in archaeology, we must always be careful when applying historical analogical sources to our research. We use documentary and ethnographic approaches ourselves (e.g., Earle *et al.,* 1987; Hastorf, 1991; D'Altroy, 1992; Sikkink, Chapter 5, this volume), but acknowledge that reliance on direct historical continuity can not only act to illuminate but also act against recognition of patterns that leave no documentary record or have no modem counterpart. In practice, we feel that the archaeological and ethnographic/historical sources of information should be treated as complementary sources of data. The latter should not preempt examination of explanations for which no correlates are found in the written sources or the modem world.

ANDEAN HOUSEHOLD ARCHAEOLOGY

Studies of prehistoric Andean households provide a base with which the information presented in the present volume can be compared. A number of projects are analyzing large-scale political organization and household archaeology (e.g., Moseley and Day, 1982; Topic and Topic, 1983; J. Moore, 1985; Morris and Thompson, 1985; Kolata, 1989, 1993; Moseley and Cordy-Collins, 1990; Watanabe and Stanish, 1990; Aldenderfer, 1993; Bermann, 1994).

Several central themes are emerging from these works. One is the nature of household activities across a range of social statuses within stratified societies and elite extraction patterns. The results of related studies show varying combinations of generalized householding activities and specialized production for a larger political economy. For example, Topic's (1982, 1990) excavations in low-status urban housing at Chan Chan yielded evidence for in-house food preparation and consumption with cooking, serving, and storage, though little to no food production, the focus being specialized production of metals and textiles likely consumed by the elite populace. This pattern contrasts with the virtual lack of craft production and food processing in middle- and high-class residences in the same center (e.g., Klymyshyn, 1982; Bawden, 1982).

In the earlier, Middle Horizon Tiwanaku polity, recent excavations suggest similar variations in the degree to which households were involved in subsistence self-sufficiency and production for the state. There is strong evidence for specialization in household activities between Tiwanaku social statuses, in settlements associated with massive state land reclamation, and in farming projects (Kolata, 1986, 1993; Bermann and Graffam, 1989; Franke, 1992; Bermann, 1994; Rivera, 1993). For example, at Pajchiri, a Classic Tiwanaku site (TIW IV: A.D. 550–900), excavations found marked differences of food remains, ceramic vessels, wealth items, and manufacturing tools between residences on platform mounds and smaller habitation mounds (Kolata, 1986). At Lukurmata, a major Tiwanaku agricultural settlement on the southern shore of Lake Titicaca, there is also substantial variation in the form and artifactual assemblages in the residential architecture, indicative of production and access differentiation among the population, with many more imperial ceramics in the elite homes (Bermann, 1989, 1994).

A second issue concerns household and polity exploitation of the vertical Andean microenvironments, for which two basic patterns exist (Mujica, Rivera, and Lynch, 1983; Stanish, 1989; Salomon, 1985; Watanabe and Stanish, 1990; Aldenderfer, 1993). The first model is based on Murra's (1972) conception of the use of multiple environmental zones by single ethnic groups. Stanish (1989:21) argues that this strategy was present in the south Peruvian Osmore Valley during Tiwanaku's era. There, all sampled household activities reflected local environmental activities but domestic architectural form and high-quality ceramics were ethnically different within the same community. The second model is proposed for the central highlands, where, on the eastern slopes, Hastings (1985) has found that different cultural groups occupied the different highland andjungle environmental zones and most likely traded with one another. The Xauxa region seems to be in the second group.

A third theme concerns the continuity and change of household activities before and during Inka rule. Because this issue is assessed throughout this entire work, we reserve our comments here to just a few key points that will be elaborated later. The available evidence implies that the lnka conquest had varying effects on households in subject communities—sometimes little, sometimes great. One of the most notable results of the Huánuco Project has been the lack of strong evidence for major changes in general householding activities as a consequence of the Inka conquest (Morris and Thompson, 1985). Around Huánuco, much ofthe interaction ofthe native ethnic groups with the state occurred primarily within state facilities. However, one elite residence in a Yacha village near Huánuco was found to contain substantial quantities of Inka state pottery. This assemblage likely was the location of ceremonial hospitality conducted by a native elite leader, sponsored by the state. Similarly, Lavallée and Julien's (1 983) study of the Asto region, immediately to the south of the Upper Mantaro, has shown little transformation in the general household economy as a function of imperial incorporation (see also Krzanowski, 1977; Hastings, 1985). Alternatively, excavations in a Canta village in the upper Rimac have shown architectural modifications toward the Inka style of rectangular buildings in the residence of a local elite (Sykes, 1989). We have also found broad changes in household activities that appear to have resulted from imperial incorporation (Costin and Earle, 1989; Hastorf, 1990b; Chapters 6, 7, 8, 9, 10, and 11, this volume). Some of these differences might be due to detail in data collection and analysis. An essential point, however, is that the lnka conquest and the application of its political economy had varying effects on households and their economies even within the relatively limited region encompassed by the central Peruvian sierra.

ARCHAEOLOGICAL APPROACHES TO THE DOMESTIC ECONOMY OF COMPLEX SOCIETIES

Archaeologists are still gaining insight into how households as domestic units articulated with larger social and economic entities that are not states. Studies across a range of societies are examining how members of a household articulate with different groups, crosscutting the household according to such criteria as gender, specialization, age, knowledge, and political status (e.g., Brumfiel, 1991; Conkey, 1991; Tringham, 1991; Reid and Whittlesey, 1982). In this book, we are interested in how the changing social, political, and economic contexts affected the domestic economy of a small-scale yet incipiently stratified society, and will build upon what we have learned through these recent archaeological insights. What were the demands of household production, agricultural scheduling, sociopolitical obligations, military tasks, artisanal produce, and other duties, and how do these intersect with household composition, labor organization, social needs, and access to goods and resources? How did the burgeoning families manage to shift the extraction patterns of labor and/or goods to aid their internal political developments? Were structures redone or simply augmented? Increased differences in political and social dominance would result in new political obligations, tighter scheduling of potentially simultaneous productive tasks for the political hierarchy as well as the household, and changes in access to environmental zones, resources, or land.

Many publications address the onset of such regional political complexity in archaeology, mostly involving external forces, includingpopulation growth (Spooner, 1972; Cohen, 1977), management needs (Wittfogel, 1957; Service, 1962; Gilman, 1981), unequal access to strategic resources (Fried, 1967; Blanton, Feinman, and Kowalewski, 1996), conflict and circumscription (Carneiro, 1970; Haas, 1982), and environmental diversity (Sanders and Price, 1968), to name a few. In this volume, we focus on additional ideas that have a material component, including specialization, supporting (financing) elite activities, or restricting access to desired goods (Brumfiel, 1980; Rowlands, 1980,1987a; Brumfiel and Earle, 1987). None ofthese previous models devotes much attention to the domestic sphere. Therefore, our orientation begins from the premise that causes for stratification lie within the social and political makeup of the group operating in daily life.

These political and economic developments are generated through the actions of people in pursuit of interests to satisfy not only their needs but also their desire for power, acceptance, influence, or status over others (Bourdieu, 1977; Giddens, 1979; Miller and Tilley, 1984), occurring mainly within their domestic settings. Political change occurs through the agency of the people working with the larger structures. A capacity for political inequality exists within all social groups (Josephides, 1985) and will be instigated through daily negotiations, feeding and reinforcing certain channels even when structures for inequality are not well defined within the society. The tensions between increasing power and disbursing it are constantly being reformulated. The potential for political centralization exists when there are wants that can be satisfied through the agency of others (Roscoe, 1993). Ultimately, in all societies, the domestic economy of households is the source of the resources directed toward political ends; thus, this is where we are most likely to see the political acts and economic consequences of an acephalous or other prestate group.

Power is the ability to get things done, to transform events (Giddens, 1984). It resides in every part of social action, and when people influence or change the course of action, there can be a concentration of power, usually on a very small scale (Giddens, 1984). As the trajectories of daily routines change, people may find themselves unable to remove themselves from the new activities, due to new familial or community obligations, or goals of their own; thus, they are exploited in realms in which they previously were not.

Therefore, such local, on-the-ground political change does not have to entail force but can be a cooperative venture for some communal good. In such settings, the aggrandizers can reinforce the extant cultural structures, creating a new nexus with which to consolidate power (Clark and Blake, 1994). A new political organization occurs when ephemeral uses of power can be consolidated and legitimized (named) into positions of authority. On the other hand, attempted realignments of power can be constrained or cut short by calling upon community practices and rules of egalitarian concepts. Denise Arnold (personal communication, 1989) recalls a poignant modem example of a community leader in southern Bolivia who tried to reinterpret local rules to retain leadership within his own family (i.e., rulership through inheritance) rather than the traditional rotational style. Some persons in the community thought that this so overstepped the boundaries of the community's tradition that they killed him. In this way, social rules and structures are the medium as well as the outcome of the activities (practices) (Giddens, 1979:69). And it is these changing actions that will be seen within the domestic economies of the household in a small-scale society.

At the multicommunity level of political relations among the Xauxa before the Inka conquest, one can assume that certain people, *ayllu* or family leaders, operating within their cultural norms of labor and allegiance to *ayllus,* began to manipulate the rules of production and consumption that perhaps generally benefited the group but simultaneously gave these individuals and their households extra extractive advantage (for a historic Wanka example, see Smith, 1989). These acts stimulated embellishments of prestige and social display, access to goods and labor, alliance building, and in the case of the Late Intermediate Period Wanka, warfare within the society (Chapters 9, 11, 12, and 13). Competition to gain supporters who would comply with what was asked of them would be part of this development, thus escalating the political process of symbolic reciprocity and increasing production and consumption of both staples and prestige goods (Hastorf, 1993). Unlike some aspects of imperial power, however, this smaller scale political activity originates at the domestic level, where individuals alter their daily actions due to new political pressures and negotiations. By focusing on production, processing, and consumption at the household level in this volume, we will begin to see shifts in the use and control over others' labor, access to produce, evidence of political displays, differential access to high-status items, and/or the concentration of decision making. These political, economic, and symbolically charged activities of the independent Xauxa will be compared to the actions of their later relatives under the Inkas in Part II of this volume.

EMPIRES AND THEIR ECONOMIES

We now turn our attention to the second half of the problem: the nature of prehistoric empires and their impacts on the domestic economy of conquered peoples. Most studies of the economic relations between central and subject polities in early empires emphasize the political economy, whereas the domestic economy is treated with a very broad brush (e.g., Gamsey and Saller, 1987). The two elements are intimately related, however, for a variety of reasons. Most notably, the political economy frequently depends on a stable domestic economy to provide its labor or revenue sources and structures itself to maximize revenue. Consequently, the demands of a newly imposed political economy may have far-reaching effects on how households organize labor and determine economic goals.

In contrast to the domestic economy, the political economy of empires can be expected to have been governed more by intensification of output than minimization of risk, labor, or cultural convention. The several reasons for this all relate to the extractive nature of the core polity. The political economy necessarily requires a surplus to support subsistence of nonproducers, a sector that tends to expand disproportionately as a means of maintaining the privileged position of the elite sectors of society. The labor invested in this added production for the more elaborated political economies is borne by the general populace rather than the sectors that benefit most. There is, therefore, reduced incentive for labor-saving practices in general; motivation for efficient production is likely only insofar as it increases control and output or dampens rebellions. Fluctuations in productivity attributable to environmental or other variations in output can also be more readily controlled by the greater storage and extractive capacities of states. Where the political economy was supported by the productive capacities of households throughout the conquered areas, as was largely the case in the Inka empire, we would expect changes in household organization and activities as a consequence of imperial incorporation.

To provide a broader context for examining these issues, we would like to sketch out two of the analytic models of premodern empires: core–periphery and hegemonic–territorial. Each approach emphasizes different features of imperial–subject relationships, drawing attention to the kinds of economic transitions that we might expect to have occurred under conditions of prehistoric imperial development. For detailed reviews of these and other approaches to empires (e.g., the tributary–capitalist and metrocentric–pericentric–systemic models), see Wolf (1982), Doyle (1986), Kohl (1987), and D'Altroy (1992).

The Core–Periphery Model

Most of the literature on ancient empires that explicitly employs a theoretical perspective uses the concepts of *core* and *periphery.* Although anticipated by André Gunder Frank's (1966) theory of underdevelopment, the core–periphery approach was stimulated primarily by Wallerstein's (1974) world systems theory, which was conceived to describe the development of western Europe since the sixteenth century. Other analysts have applied the model's central precepts to premodern empires, especially in the Near East and Mediterranean (e.g., Ekholm and Friedman, 1979; Larsen, 1979a; Kohl, 1987; Rowlands *et al.,* 1987; Champion, 1989a).

This model focuses its analysis on exploitation of subordinate polities, collectively called the periphery, by a central, elite polity, termed the core. The core is a region with strong state institutions and a national culture, whereas peripheries are politically constituted either by weak indigenous states or societies without state organizations (Wallerstein, 1974:349; see also Schortman and Urban, 1987:56; Champion, 1989b: 13–16). Peripheries are exploited for low-wage, low-profit, and low-capital labor-intensive goods. Between these two areas are the semiperipheries, which are intermediate formations in terms of economic activities, strength of the state, and cultural integrity. Wallerstein argues that the semiperipheries are useful to the core because they aggregate vital skills and can deflect unpopular political pressures going both ways.

The core–periphery model has a spatial component, but the most important links are economic and political. Ekholm and Friedman (1979) argue that core–periphery relations revolve around the accumulation of capital, which they view as a form of wealth that can be transformed into durable goods, such as metal, money, land, or labor. Because elite accumulation of such capital is common to both archaic and modem empires, they see a fundamental continuity in imperial processes over history (cf. Polanyi, Arensberg, and Pearson, 1957). They cite early Mesopotamian empires as examples of polities within which an interregional resource base was exploited to the benefit of the core elites. Except where water transport was uncommonly efficient, such as the Roman Mediterranean, however, core regions could not depend on the periphery for basic, bulk goods because the energetic costs of transporting them were prohibitive (see Hassig, 1985). Instead, most goods moved long distances were light prestige or symbolic items, the procurement of which often underlay expansionist tendencies in the first place (Adams, 1974, 1979a; Schneider, 1977; van de Mieroop, 1992).

Rowlands (1987a:5), recognizing this problem, suggests that the nature of the consumed goods was less important than the means by which the core elites extracted them. From his perspective, the key points in the power relationship are that the ruling elites became net consumers of resources extracted from other polities, and that the peripheral polities had to reorganize to meet demands for surplus production (cf. McGuire, 1989). Wallerstein (1974) has argued that this process results in the simultaneous economic development of the core and underdevelopment of the periphery, since both labor and extraction of resources were transformed. Wolfs (1982) study of European world relations since 1400 illustrates how the collusion, co-option, or alliance of peripheral elites with core elites is central to this process (see Atkinson, 1989, for a non-Western example of this). Peripheral elites typically restructure the local production of one or two critical resources for transferral to the core. Although they have less choice in formation of alliances than do the core elites, these subordinate rulers clearly benefit from the relationship and have the capacity to negotiate some terms of interaction (Flannery, 1976; Kohl, 1987; Rowlands, 1987a:5). The costs of the intensified production are largely borne by the peripheral nonelites, who receive technology, organization, ideology, and some sumptuary goods in exchange (McGuire, 1989).

Wallerstein argues that premodern empires were integrated primarily through political relations, which distinguishes them from the modern world economies with a more overt economic emphasis (see also Eisenstadt, 1963; Larsen, 1979b:91; Doyle, 1986). This view is not widely shared by archaeologists, although many researchers consider political power to have been as important as economic power in organizing empires and spatially more extensive (e.g., Adams, 1974, 1979a, 1979b). Because of the transportation limitations noted earlier, the broadest extension of imperial power would have been military or political, and peripheral economic control would have focused on the procurement of selected luxury goods and raw materials for the central political economy, in addition to local staple production for the local imperial overseers. This position, expressed specifically by Adams (1965) for the Aztecs, partially recapitulates Lattimore's analysis of the Chinese and Central Asian empires (1962:480–491, 542–551; see Mann, 1986:9; Morgan, 1986).

Although the core–periphery model lends itself to broad qualitative characterization, investigators recognize that both cores and peripheries encompassed regions with internal variation (e.g., Adams, 1974, 1981; Larsen, 1979b; Yoffee, 1979; McGuire, 1989:44). For some authors, this variation in political and economic relations was a principal source of imperial transformation. The dynamics of political realignments and economic development led to the decline of centers of power and the emergence of new cores in the former periphery as part of long-term cycles of development and collapse (Friedman and Rowlands, 1977:269; Champion, 1989b: 17–18; Randsborg, 1989).

The Territorial–Hegemonic Model

This approach to imperial organization focuses on the costs, benefits, and effectiveness of various strategies, ranging from clientage to provincial annexation to retrenchment. This model attempts to account for general trends and variations in terms of degrees of control exerted throughout imperial holdings (Luttwak, 1976). Hassig (1985: 100–101, see also 1988) observes that forms of dominion vary along a continuum. The most indirect form lies in the low control–low investment approach characteristic of hegemonic rule, whereas a high control–highinvestment strategy defines territorial rule.

Hegemonic rule includes a core polity, usually a state, with client polities responsible for applying imperial policy, extracting resources for imperial consumption and providing security out of their own resources (Hassig, 1985). Hegemonic control is most effective during imperial expansion toward the margins of imperial territory and in regions with relatively few resources of interest to the central polity. Examples include the Aztec empire (Hassig, 1985) and Rome of the first century A.D. (Luttwak, 1976). The approach is economical, relying on coercive diplomacy, punitive expeditions, and ideological persuasion to enforce extraction. Because the central polity takes little interest in subject affairs, leaving those matters in the hands of compliant local elites, there is little direct political intervention, although key marriages and other social alliances may be entailed.

Territorial control involves direct occupation and governance of subject territories, with the central state being responsible for underwriting security and administration. This approach generally entails administration through a developed bureaucracy, erection of an infrastructure of support facilities (e.g., roads, storehouses, ports), and hardening of frontiers with chains of fortifications. Territorial rule provides the advantages of greater administrative control and more direct enforcement of resource extraction. A territorial strategy may be expected for more mature empires and for those threatened by powerful clients. Examples include Rome of the second century A.D. throughout Europe (Luttwak, 1976) and late Imperial China (Skinner, 1977). As Luttwak points out, this strategy is far more expensive in its use of military and political resources, because security and administration are not shunted offto client elites. Borders must be more securely maintained because populations that had been under clientage during hegemonic rule have become transformed into citizens. Luttwak argues that there may be pressure to shift from a hegemonic toward a territorial strategy over time because the value of a client in deflecting external threats is directly proportional to the hazard the client poses to core stability. It may therefore become advantageous to shift the relationship from client to province; from hegemony to territory.

Hegemonic and territorial strategies grade into each other and may be applied in different parts ofthe empire, and at different times, as circumstances change (Hassig, 1985). Because conditions vary spatially and temporally within the imperial domain, differing combinations of military, political, economic, and ideological power become more or less secure and cost-effective (cf. Mann, 1986). In general, the range of strategies depends on the organization of the central polity and the subject groups, the spatial distribution of resources and population, power dynamics, the scale ofresources that can be brought to bear to exert control, and the imperial goals.

State–Provincial Relations

Together, these models direct our attention to pivotal relationships between the imperial state and its subject populations. A key point is that the differing resources and organizations of subject groups contribute directly to the imperial policies that will work in any given province. The kinds of political relations that can be used to rule a conquered state, for example, may be ineffective with the more consensual or negotiated political structures of smaller-scale societies. We may therefore expect the rulers of an empire to maintain a variety of political relations with subject groups.

In the lnka case, early alliances were important with the nearby Quechua and Lupaqa, whereas patron–client relations were applied in parts of Ecuador (Salomon, 1986) and in northwest Argentina (Lorandi, 1988). Conversely, more fully developed bureaucracies were generally found in regions that had been under imperial control for some length of time, that were comparable to the organization of the core state, or that had well-differentiated structures at the time they were drawn under imperial control. In the Inka empire, the state bureaucracy was most fully formed in a band from Lake Titicaca to Quito among societies with cultural forms similar to the Inkas. An alternative political approach was required when governing polities that were both too difficult to rule directly and too powerful to leave intact. For the Inkas, the Chimu Empire of the north coast of Peru provided such a predicament. The solution was to break up the polity and rule through regional elites.

Economic strategies of imperial rule are equally varied. We have already discussed some elements of these and the following chapter provides a more detailed look at the lnka imperial economy. In brief, however, we may note that several factors may be identified as driving forces in the formation of imperial economic policy, among them the nature of the available resources, the costs entailed in intensifying production or extracting surplus, and the intended location of consumption. An economic policy directed toward core consumption of prestige goods will require much less investment in provincial development and will correspondingly be less disruptive than a strategy intended to expand fully integrated imperial territory. As is the case with political control, the nature of the subject economies plays a pivotal role in determining imperial options. The Inkas, for example, did not have the same option of tapping into monetary or marketing systems found in the Old World and in Mesoamerica, and consequently relied heavily on corvée and development of state resources.

Given the imperial goals and assessment of costs and benefits of different strategies, we may therefore expect a range of economic formations for the Inka state. At one end, we may anticipate a focused development of particular resources, such as mineral wealth or environmentally specific goods (e.g., spices, hemp), that leaves much of the subject economy intact. The Aztec penetration into the cacao, gold, cotton, and feather-producing lowlands of Mexico provide an example of a targeted economic approach outside the Basin of Mexico (Berdan, 1975; Hassig, 1985). At the other end, we may expect the state to invest heavily in an infrastructure of transportation and communications facilities and public works (e.g., water systems). In the more intensive kinds of economic control, the state may develop an independent productive economy based on state resources and staffed by state personnel. The specialized agricultural enclaves of the Inka and Sassanian empires may be cited here (Murra, 1980; La Lone and La Lone, 1987; La Lone, 1994; Wenke, 1987).

Collectively, the differing imperial goals for state expansion, the varied natures of the subject societies, and the costs and benefits of differing approaches would have contributed to varying policies of rule across the same empire. For these reasons, among others, we feel that it is necessary to explore both the systematic and particular features of imperial–provincial relations in order to explain the effects of imperial conquest on the domestic economy of any given region.

THE INKA EMPIRE AND THE DOMESTIC ECONOMY

Despite their utility in assessing imperial formations at a grand scale, none of the widely used models of empires, such as those sketched out earlier, has been linked effectively to the archaeological analysis of household economies. Nonetheless, the models do focus our attention on the related issues of intensification of production, the nature and degree of labor specialization, forms of supervision, and the range of activities pursued by household members as a consequence of imperial interaction.

As a starting point, we may note that under imperial rule, production can be intensified either (1) indirectly, through exaction of tribute or taxing the raw or finished products or transactions in those goods, or (2) directly, through labor taxes or establishment of state production enclaves administered by client elites on behalf of the central polity. No matter the precise means by which intensified production was achieved, we would anticipate changes in the domestic economy of subject groups with incorporation, visible at the household level. For example, given the extractive nature of state–local relations, we might anticipate evidence for an increase in the proportion of settlements producing commodities that were intended for export.

That kind of shift is described by Hastorf (Chapter 7, this volume; see also Hastorf, 1993; Russell, 1988), who argues that the increased maize production required by the state might have also shifted the balance among various household productive activities, even among populations that remained in their home territories. First, although we would not anticipate the same degree of extractive dual economy described for capitalist intrusions into modern societies, the Inka evidence points toward increasing separation of state and subject productive activities as a consequence of state-fostered intensification and manipulation of the local residence patterns. An outcome of this, described in subsequent chapters, can be seen in the degree to which households in communities newly settled under Inka rule (e.g., Marca, Chucchus, Huancas de la Cruz) were more specialized than their predecessors in Wanka II times.

A second point focuses on the flow of technology and sumptuary goods back to the subject households from the overarching state. In the domestic economy, this may show up in changing patterns of consumption as the composition of the goods within households changed, and as the balance shifted between products of generalized and specialized labor. Similarly, we may anticipate changes in the composition of the material evidence for production. As will be described in subsequent chapters on metals (Owen, Chapter 11, this volume) and ceramics (Costin, Chapter 9, and D'Altroy, Chapter 10, this volume), there was a notable change in craft production with the onset of Inka rule in the Upper Mantaro. This productive change is also visible in a shift from arsenic to tin bronzes, and in the marked improvement in the technology of the finest ceramics, made under state control (see also Hagstrum, 1986). This trend is paralleled in the use of material goods denoting high status, since household status consumption moved from the indigenous products to goods of state manufacture or state iconography.

Third, the formation of state–subject relationships altered the kinds of links between household members and the larger encompassing groups. Chapter 2 describes the project's explicit expectations with respect to this shift toward stronger ties between local and imperial elites (see also Earle *et al.,* 1987:1–4). As observed earlier, the relations between the core and subject elites are typically emphasized in analyses of early empires. One potential outcome is that these elite–eliteties might produce greater differences between the more privileged members of subject society and the general populace. This may show up, for example, in household architecture and in access to high-quality or exotic goods (see Smith, 1987). Of special note in the lnka case is the degree to which the state intruded into low-level politics by underwriting the ceremonial hospitality that lubricated Andean politics (Hastorf and Johannessen, 1993). As links between the imperial core and the broader population of subject regions became developed, the ties of individual household members to the broader polity could have also separated some people from others within households. This kind of distinction is noted here in the greater participation of males in state-sponsored activities (Hastorf, Chapter 7, this volume).

A fourth area of potential change in the household concerns how the application of new demands on labor or other household resources may result in changes in household composition. This is one area in which the underlying principles favoring state production would have the potential of directly contravening the interests of households. The state's interest in increasing production contrasts starkly to the household's or the *ayllu's* interest in keeping risk and labor low, and remaining self-sufficient. Because Inka taxes were applied by household, it would have been in the interest of the populace—and against that of the state—to increase mean household size. This could be accomplished through any of a variety of means, among them increasing the number of children or delaying the age at which married couples took up new residence. The Inka demands that state activities, such as farming, take precedence over household activities potentially would have created scheduling bottlenecks at key times such as harvesting (Mitchell, 1980), thus supporting the retention of grown children within the household.

From the taxpayer's perspective, larger households would have been more secure, since a smaller proportion of disposable labor would have been tapped off for state demands. In contrast, a larger number of small households would be to the state's benefit. Although archaeological evidence of this sort of transformation is difficult to obtain, there are documentary suggestions for population growth under Inka rule (Toledo, 1940c) and archaeological evidence for an increase in the extent of architectural units that we assume to be the residences of Xauxa families (see Chapters 4 and 6).

A fifth area of change in the domestic economy results from the state's alienation of resources and resettlement of the subject populace for reasons of security. Where this occurred, the resources available to the general population would change, with two notable consequences. First, the products produced and consumed by household members might shift in nature or proportion. As argued later (especially in Chapters 3 and 4), the voluntary or forced shift of many sierra groups out of hilltop settlements into valley settlements would have moved them from tuber-complex and pastoral lands into lands more suited to production of all crops.

A related change occurred in the *mitmaqkuna* resettlement program, when whole villages were relocated to new regions. Depending on the degree to which the people exploited the resources in the immediate vicinity of their settlements, this could have had a significant effect on diet, for example, let alone the loss of important ancestral spirits and territorial markers.

Second, the spatial movement and possible subsistence changes would have potentially required new allocations of labor and scheduling. In contrast to the kinds of changes that might be anticipated under newly imposed imperial rule, several forces would have acted to keep the domestic economies of conquered regions relatively stable. Because much of the state's ability to extract resources depended upon the general productivity of the populace, it would generally be in the state's interest not to undercut the viability of the local economies. In addition, state administrations simply did not have the organizational resources to manage the affairs of every household economy. Finally, the same kinds of productive techniques that characterized economies prior to state expansion were frequently employed to produce for the state, albeit with a changed labor organization.

Here we are getting at the essence of one of the central problems of assessing the domestic economy in a state that increasingly extracts resources from its constituent population through time. To what extent and in what ways are household labor, composition, and resource use a result of independent decisions made by members of self-sufficient agrarian communities? Or in what ways are they consequences of the demands of the extractive political economy, stimulated by the local elites or by the overarching state? In a polity such as the Inka Empire, the balance between these two elements must have varied markedly, depending on the natures of both the local economy and the imperial interests in the region. In the chapters that follow, the contributors to this volume illustrate and examine the implications of these two concerns in assessing continuity and change in the Xauxa domestic economy.

In summary, the theoretical issues raised here focus our attention on institutional and small-scale transformations and changing activities before and after Inka rule that could have effected changes in the domestic economy. We realize that because the articulation between an empire and the domestic economy of its populace is a complex issue, a case study can provide only part ofthe picture. We need to be judicious in applying the patterns seen in the Upper Mantaro region to the remainder of the empire, let alone in making cross-cultural comparisons. Nonetheless, we feel that the political processes antecedent to the Inka conquest and the transformations that followed are indicative of both a particular historical situation and more general social processes. It is our hope that the presentation here will provide insight into these issues.

OUTLINE OF THE BOOK

This volume is divided into three parts. The first five chapters (Part I) provide the theoretical and methodological background to this substantive study ofthe Xauxa domestic economy and transformations under lnka rule. Chapter 2 on research strategy describes the cultural context, the specific research questions identified at the inception of research and the methods used to address them in the field (see also Earle *et al.,* 1987). Hastorf then describes in Chapter 3 the diverse environment ofthe northern Upper Mantaro study region, covering what we know of topography; the past climate; potential resource use zones based on information including ecology, crop geography, and comparative modem agricultural data; and the resources that would have been important to the residents, including plants, animals, water sources, rocks, and soils. Chapter 4 sketches the archaeological sites that were studied in detail, in order to establish the archaeological baseline within which the subsequent analyses were conducted. Chapter 5 provides an ethnographic understanding of traditional modern households in the Andes. Sikkink's study details issues surrounding the economics of the Andean household, critiquing the concept but noting its analytical importance. The data from this chapter clearly derive from a society transformed from centuries of European rule, entailing the shift from largely self-sufficient communities to *encomiendas* and market economics. However, aspects of decision making among the contemporary Andean peasantry arguably parallel those of the late prehistoric farmers of the region, and this chapter provides insights into the nature of mixed farming households.

Part II provides the substantive archaeological results of the project. The next six chapters cover materials-specific analyses in the context of specific theoretical and methodological issues. Each author in this section, while presenting the substantive results of coordinated research, has defined additional questions of theoretical interest and developed ideas that extend or complement the theoretical approaches outlined in the chapters. DeMarrais sets the context by examining the levels of social interaction within communities, associating site plans, pathways and residential architectural forms with kinds of household and kin relations. Subsequently, the other authors show how aspects of the kinds of variation described earlier were intertwined or played different roles in Wanka II and Wanka III. For example, the chapters on botanical materials (Hastorf), fauna (Sandefur), ceramics (Costin, D'Altroy), and metals and wealth (Owen) examine variation in production among households, across communities, between classes, and across environmental zones, where the data are amenable to these kinds of comparisons. Each chapter also examines consumption of the same materials, thus showing the relationship between production of goods and access to the products.

The last three chapters (Part III) provide more integrative overviews, tying the data and arguments from both Wanka II and III together synthetically. The goal is to assess the domestic economy according to the available evidence in light of the models of indigenous development and imperial transformation described in detail throughout the volume. Earle's Chapter 12 on exchange evaluates changes in movement of goods subsequent to the Inka conquest and forcible imposition of peace. He shows how the patterns of production and circulation of the full range of material goods were linked through regional networks. Chapters 13 and 14, by Hastorf and D'Altroy, respectively, conclude the volume with synthetic assessments of the nature the domestic economy in the dynamic pre-Inka era and under imperial rule.

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Chapter 2

The Cultural Setting

Terence N. D'Altroy

This chapter presents the cultural setting and research questions underpinning UMARP's study of the Xauxa domestic economy before and under Inka rule (Figure 2.1).[1] Inquiry into the shifts in an agropastoral economy from self-rule to imperial dominion was a challenge, because the problem was both regional in scope and fine-grained in focus. The work required studying several organizational levels under political formations that made different claims on household members. Because their resources were finite while environmental conditions and social demands were not fully predictable, households continually had to make decisions about the disposition of labor, materials, and other resources. An assessment of the domestic economy thus required that we define the pre-Inka social and environmental baseline and investigate the details of household activities over time.

When we began our studies, we were aware that the pre-Inka households had been linked to one another largely by kinship, coresidence, and only moderately developed political hierarchies. Under Inka rule, the households and the imperial state were connected in novel, important ways. The Inkas relied on mostly self-sufficient communities for productive labor, placing onerous demands on the subject populace, especially when agricultural labor was at a premium. They could not undercut the viability of their subjects without threatening the state's security, however, and the Inkas left indigenous societies to their own devices for subsistence activities (Murra, 1980). The vaunted reciprocal obligations of the state to its subjects were instead manifested primarily through political and ceremonial relations; subsistence support of the general populace occurred primarily at times when people were actively working for the state. Changes in local economies were therefore likely to be selective with respect to both the households and the activities involved.

Research into the domestic life of the residents of the Upper Mantaro was feasible largely because our work built upon extensive prior studies by other scholars and was nested

[1] In many of UMARP's previous publications, we have used the term *Wanka* to refer to the collective societies living in the Upper Mantaro region during the late prehistory After spirited discussion among project members, the volume's lead authors decided to use the narrower term *Xauxa* for the populace whose material remains are under study here. Although some of our publications have already made this distinction (e.g., D'Altroy, 1992:48–52; Hastorf *et al.,* 1989; Hastorf, 1993), we feel we owe an explanation to readers who may be confused by the terminology. We are using the term *Xauxa* in the interest of accuracy, since the entire UMARP research area lies entirely within the territory associated with the Xauxa ethnic group. Rather than extrapolate our conclusions to the Lurinwanka and Ananwanka people from whom we do not have comparable data, we have chosen to focus our terminology. We have, however, retained the chronological terminology of Wanka I–IV because these terms describe archaeological phases, not particular social groups.

within a larger research program conducted by UMARP. At the beginning of our studies in1977, we were exceptionally fortunate in having research access to the most intensively surveyed region in the central Andes. The major changes in prehistoric society that were readily visible in the material record had already been recorded. The challenge for UMARP's research design was to cover a wide cross-section of the society finely enough to distinguish subtle change from stability. This chapter sketches the history of archaeology

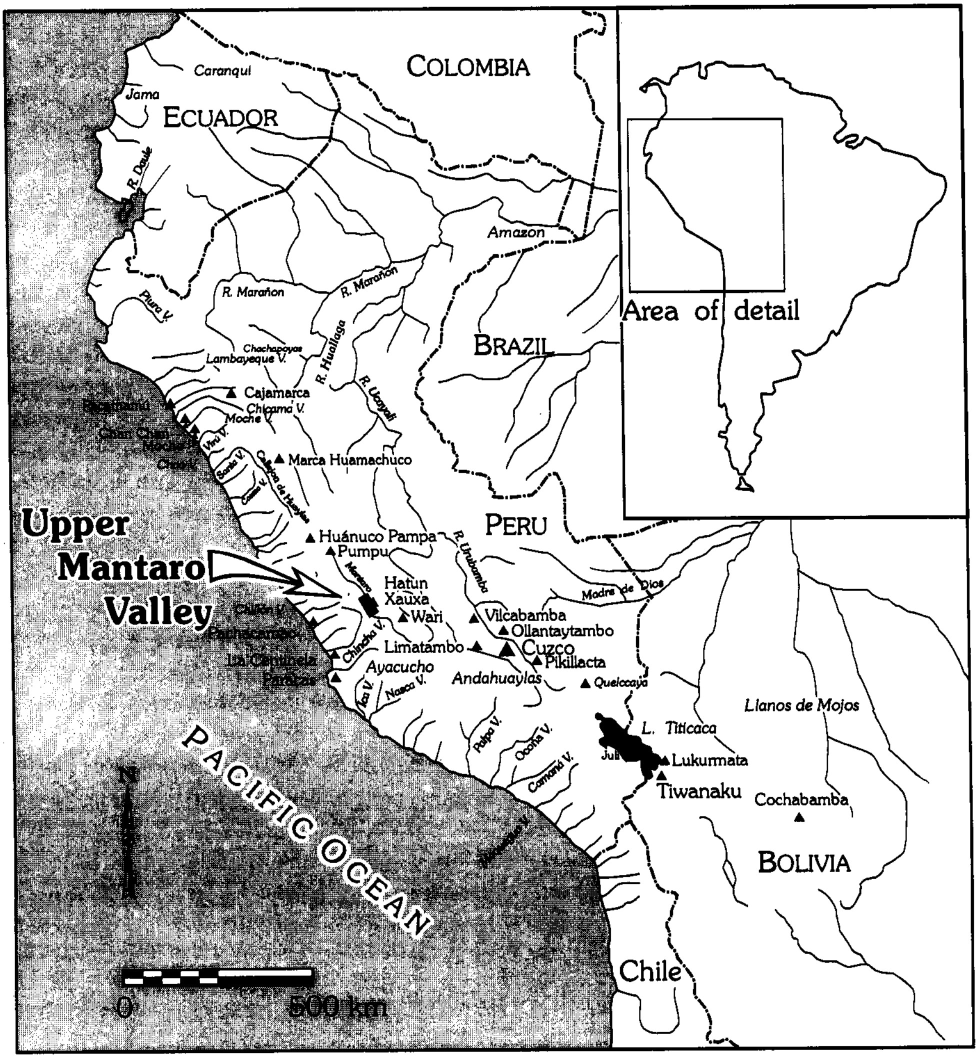

Figure 2.1. Location of the Upper Mantaro research region in the central Peruvian highlands.

in the region that served as our baseline and the cultural setting during the key periods of interest. It then turns to the research questions that UMARP addressed. The following two chapters on the environmental and the archaeological setting provide the detailed information collected to study those questions.

ARCHAEOLOGICAL STUDIES IN THE UPPER MANTARO VALLEY

Antecedent Research

At least as early as the late 1540s, visitors were taking note of the archaeological remains in the central Peruvian sierra. On his way from the "Valley of Xauxa" to Huamanga, the chronicler Cieza de León commented that he had seen "certain very ancient buildings, completely undone and destroyed" on the heights above the valley.[2] Cieza de Leon was almost certainly describing Late Intermediate Period ruins, perhaps even some analyzed in the present study, since the Inka storage structures on the hill slopes were still being maintained by the native populations when he visited. Cieza de Leon (1984:Ch. 84, pp. 242–243) also described the Inka provincial center of Hatun Xauxa, which was already well on its way to ruin only fifteen years after the first Spanish venture into the valley. The Inkas themselves initiated the destruction in October 1533, when Challcochima's army set flame to the installation to foil the Spaniards' efforts at pillaging (Sancho de la Hoz, 1917:141). Three centuries later, Charles Wiener (1 880:242–243) described and illustrated some of the surviving architecture but mistook the storage facilities on the slopes above the center for residential neighborhoods.

Professional archaeological research in the Upper Mantaro began in the middle of the twentieth century as scholars integrated the valley's ceramics into interregional chronologies (Kroeber, 1944; Rowe, 1944; Horkheimer, 1951; Lumbreras, 1957, 1959; Flores Espinoza, 1959; Fung Pineda, 1959; Lavallée, 1967). Studies by Garcia Rosell (1942), Porras Barrenechea (1950), and Guzmán Ladrón de Guevara (1959) also described a number of major archaeological sites. Morris's (1967) study of the Inka storehouses above Hatun Xauxa provided the first systematic review of some of the region's imperial remains.

The present study builds most directly on the research begun in the 1950s by Ramiro Matos Mendieta in his Junín Project and extended in his collaboration with Jeffrey Parsons and Charles Hastings in the 1970s. Taking a human ecological approach, Matos Mendieta (1959, 1966, 1968, 1971, 1972, 1975) conducted reconnaissance surveys to assess long-term settlement pattern change in the Andean highlands. Although focused on the Formative era, his work outlined the entire prehistoric sequence from the Mantaro Valley to the Junín *puna* (Figure 2.2). In an independent study in the main Mantaro Valley from Jauja to Chupaca, David Browman (1970, 1974, 1975) provided a complementary source of information on settlement organization and chronology. His work concentrated on changes that he proposed resulted from the Wari presence in the region, including shifts from pastoralism to agriculture, and from dispersed villages to urban communities.

[2] "Y caminando por el real camino, se va hasta que en vnos altos que están por encima dell valle se veen ciertos edificios muy antiguos todos desechos y gastados" (Cieza de Leon, 1984:Ch. 85, p. 245).

Estimated absolute date (A.D.)	Andean period	Mantaro Valley period	Inka Ruler	Major Ceramic Types	Period, as per Parsons and Matos (1978)	Ceramic Type, as per Browman (1970)
1570	Colonial	Wanka IV	Manqo Inka, etc.			
1532	Late Horizon	Wanka III	Waskhar/ Atawallpa	Inka Wanka Reds, Base Roja, Base Clara	Inca	Arhuaturo Inca
1528			Wayna Qhapaq			
1493			Thupa Inka Yupanki			
1471			Pachakuti Inka Yupanki			
1463				Wanka Reds, Base Roja, Base Clara	Yanamarca	Arhuaturo
1438	Late Intermediate	Wanka II	Wiraqocha Inka			
1350		Wanka I	Manqo Qhapaq?	Base Clara		Matapuquio
1000	Middle Horizon			Huacrapuquio	Wariwillca I	Quinsahuanca
						Calpish
500	Early Intermediate			Usupuquio	Patankoto Jauja	Huacrapuquio
						Usupuquio

Figure 2.2. Chronology of Upper Mantaro region occupations.

In 1975–1976, working as Matos Mendieta's associates, Parsons and Hastings recorded all the ceramic period sites in four major sectors of the central highlands: (1) the valley around modern Jauja and the surrounding hills, (2) the Junín *puna* to the north, (3) the upland forests of Huasahuasi to the northeast, and (4) the warm eastern valley and hill slopes of Tarma. A model of survey methods in difficult conditions, their work described major evolutionary changes throughout prehistory by evaluating trends in demography, settlement distributions, and resource use. The research has provided the best data yet available for understanding the sequence of sociopolitical and economic developments in the Andean highlands. The information includes site location and size, environmental setting, basic architectural data, and chronological position assessed from surface ceramic collections (Parsons and Hastings, 1977; Parsons and Matos Mendieta, 1978; Matos Mendieta and

Figure 2.3. The northern Upper Mantaro Vally, looking north, showing modern Jauja in the left foreground, Laguna Paca in the middle background, and the northern Yanamarca Valley toward the upper lefthand corner. Photo courtesy Servicio Aerofotográfico Nacional, Lima Peru (No. 0-15298).

Parsons, 1979; Hastings, 1985; Parsons, Hastings, and Matos Mendieta, 2000). Because these scholars—in a model of collegiality—permitted us free access to their raw data, UMARP had a major leg up in problem-oriented research from the start.

The Upper Mantaro Archaeological Research Project

Initiated in 1977 and active in the field through 1986, UMARP was designed to be a multistage investigation into the relationships between political and economic development in complex society. The project had two central objectives: to describe the cultural changes that occurred in late prehistory, and to explain the relationship between political and economic processes at the heart of the developments (Earle *et al.,* 1978, 1980a, 1987). UMARP's research has been problem-oriented since its inception, emphasizing explicit links among theory, method, and data. Since the regional archaeological record contains close to

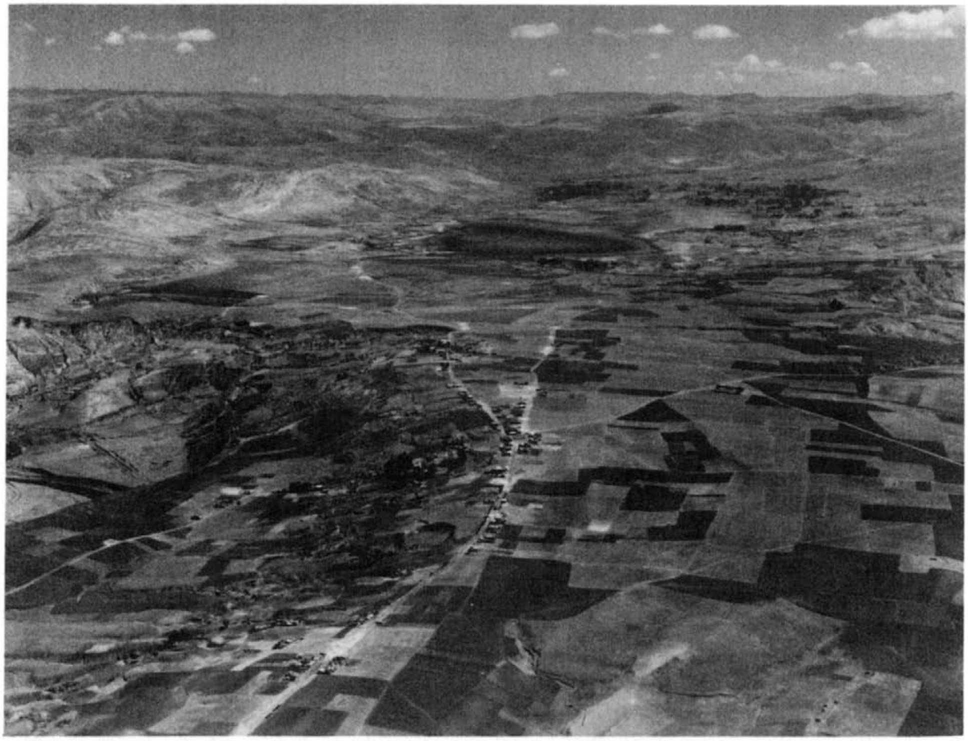

Figure 2.4. The Yanamarca Valley, looking north; Laguna Tragadero lies in the middle background, with Hatunmarca on the hill immediately to its left. Photo courtesy Servicio Aerofotográfico Nacional, Lima Peru (No. 0-1308).

300 sites, some quite large, we felt it imperative to define our research problems carefully, while gathering an extensive, targeted database.

As a regional project, UMARP needed to balance between extensive areal coverage and intensive study of particular settlements or topics. The Junín Project's broad perspective permitted UMARP to concentrate on a continuous, restricted zone—representative of the montane landscape—that would be effective for studying local settlement shifts and land-use practices. The territory included the northern half of the main Mantaro Valley and several tributary and internally draining valleys beyond the first hills flanking the main valley, especially the Yanamarca, Paca, Masma, Jauja, and Quishuarcancha Valleys (Figures 2.3, 2.4). The project's southern limits correspond closely to the borders of the lands occupied by the Xauxa (or Hatunxauxa) populace, the northernmost of three provincial subdivisions under Inka rule. The two more southerly groups of the province, called Wanka Wamaní, were named the Lurinwanka and Ananwanka (Chapter 4).

The Junín Project's survey was augmented by a limited UMARP survey in 1983 in the Río Quishuarcancha drainage to the west of the Jauja survey zone. Earle and Kane's 1986 resurvey of much of the main valley collected materials that were used to clarify the settlement patterns based on the ceramic chronology refined by LeBlanc (1981) and Costin (1986). Much of UMARP's fieldwork has been concentrated in the Yanamarca Valley, an internally draining basin northwest of the main Mantaro Valley. We chose to focus on that region for several reasons. The area encompassed the basic range of highland environmental zones—valley floor, hill slopes, uplands, and *puna* (Chapter 3). It seemed reasonable that the sites found there would provide a cross-section of the central sierra's residential archaeological remains. The Yanamarca was also home to the largest indigenous settlements in the entire Mantaro basin during late prehistory. With fourteenth century settlements that possibly housed as many as 11,000 people, Hatunmarca and Tunanmarca were among the largest towns in the entire Peruvian highlands. Their only rivals in size were located in the Cajamarca and Huamachuco areas about 500 km to the north (D. Julien, 1988), and in the Lake Titicaca Basin, home to the powerful Lupaqa and Qolla polities (Julien, 1983, 1993). It was a great benefit that the Inka provincial center, Hatun Xauxa, lay just over a low ridge of hills in the main valley and that the Inka highway from Cuzco to Quito passed through the east side of the Yanamarca. The great majority of the people thus lived only half a day's walk from the regional center of state power. The widespread distribution of Inka polychrome ceramics further suggested that state–local relations could be evaluated at communities of distinct positions within the regional settlement hierarchy. Those features together suggested that the region was well suited to the kinds of questions that concerned the project in general.

During its decade of research, UMARP personnel conducted three major phases of fieldwork. The first examined indigenous sociopolitical development and resource use, and the regional changes wrought by the Inka occupation. The second, on the domestic economy, is the subject of the present volume. The third project focused on a stratigraphic clearing excavation at the deeply stratified lakeshore settlement of Pancan (J1) and a resurvey of the main valley using a refined ceramic chronology. A fourth project in 1988, on the regional political economy, had to be suspended because of the hazardous political climate in the central Andes. The first and third projects are summarized here to help set the context of the present study.

In 1977–1980, the questions of greatest interest concerned settlement organization, demography, political hierarchy, and resource use. The Junín Project's survey indicated that a marked settlement hierarchy had arisen during the last few centuries before the Inka conquest, which suggested that a centralized political system was taking form. It remained unclear, however, how the preimperial changes had occurred, and how the indigenous society may have changed under Inka rule. This work required refinement of the chronological sequence, a tedious job that Catherine LeBlanc (1981) undertook in the context of her study of local political development. She used stratigraphic excavations, detailed mapping at certain sites with standing architecture, and surface collecting at all sites within the Yanamarca Valley to devise a new framework. Her work divided the Late Intermediate into the Wanka I (A.D. 1000–1350) and Wanka II (1350–1450) phases, and partially defined a Late Horizon component separate from the prior occupations (Wanka III: 1450–1533). It also allowed her to evaluate the relations among warfare, population growth, and settlement organization in the formation of sociopolitical hierarchies.

A related project examined Inka rule in the region. The Junín Project showed that the most recognizable Inka impact was the establishment of an administrative overlay, visible in the provincial capital Hatun Xauxa, the road network, and the storehouses (Parsons and

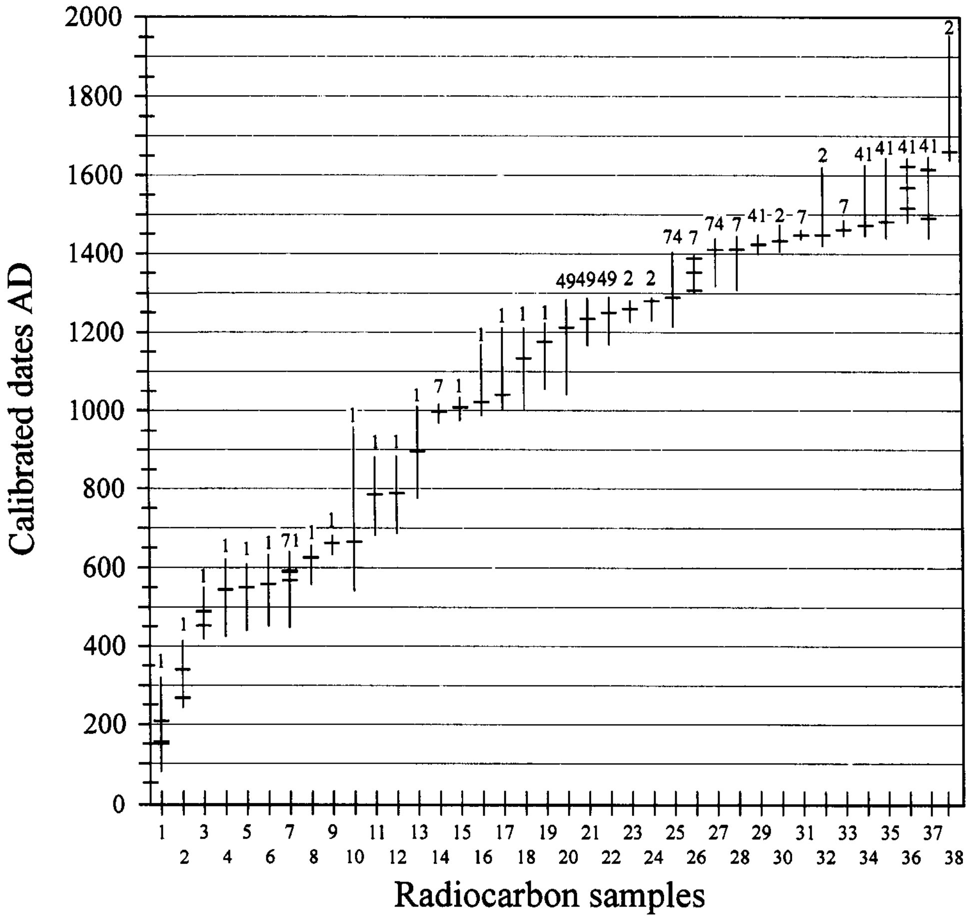

Figure 2.5. Radiocarbon chronology of excavated prehistoric sites in the Upper Mantaro region, ordered chronologically as follows: 1 = Pancan (J1), 71 = Tragadero Viejo (J71), 7 = Tunanmarca (J7), 49 = Ushnu (J49), 2 = Hatunmarca (J2), 41 = Umpamalca (J41).

Hastings, 1977:59–60). No significant reorganization of the valley's people could yet be identified. Instead, the Inka occupation created a dual settlement pattern, with the newly established state sites forming a superstructure over the continuing local occupation. LeBlanc's refined ceramic chronology, however, showed that there was an extensive shift of population downslope from defensive hilltop communities to a more dispersed distribution along valley flanks. That move was coupled with the formation of a partially discrete state economy and the integration of local lords into the imperial administration (Chapter 4). The ties between state–local relations and broader questions of imperial development are examined in detail elsewhere (D'Altroy, 1987, 1992; Earle *et al.,* 1980a, 1987; D'Altroy and Hastorf, 1984; D'Altroy and Earle, 1985; Earle and D'Altroy, 1982, 1989; see Chapters 12 and 14, this volume).

The third main element of the 1977–1980 research, conducted by Hastorf, examined the relationship between sociopolitical development and changes in resource use over the entire ceramic period occupation (Hastorf, 1991, 1993; Hastorf and Earle, 1985). The Junín

Project's information on the distribution of habitation sites and agricultural features indicated that there had been marked changes in the use of lands for agriculture over time. Most prominent were low-valley use during the early stages of agricultural occupation, a shift to the high rolling uplands during the Late Intermediate, and a partial shift to the lower valleys and slopes under Inka rule. Hastorf's study entailed evaluation of a least-cost model for land-use intensification associated with political development, and change in settlement and demography. Fieldwork included a modem land-use survey, analysis of prehistoric agricultural practices, and study of botanical remains recovered from archaeological contexts. The area covered by this research encompassed the main Mantaro Valley and its subsidiary valleys. This project was thus spatially and temporally more comprehensive than LeBlanc's study, which focused on the Wanka I–II occupation of the Yanamarca Valley.

The 1986 fieldwork was intended to clarify the long-term development of society within the main valley. Stratigraphic clearing excavations at the lakeshore site of Pancan (J1) were conducted to assess transitions in a single settlement that had essentially continuous occupation from the Early Intermediate Period to the Late Horizon (Hastorf *et al.,* 1989; Lennstrom, 1992). A parallel project resurveyed the main Mantaro Valley using the refined ceramic chronology to assess settlement change over the entire occupational sequence. That study helped clarify the sequence of settlement changes and estimates of the areas of all sites that had been surveyed by Parsons and Hastings.[3] The most notable contribution of the new survey was the refinement of the Late Intermediate Period and Late Horizon occupation into the Wanka I, II, and III phases, bringing them into agreement with the chronology established for the Yanamarca Valley settlements.

THE CULTURAL SETTING

Radiocarbon Dating

Because the region's chronology had previously relied on stylistic affiliations of pottery with ceramics from elsewhere, UMARP took a series of radiocarbon dates to help fix the calendrical sequence. The radiocarbon evidence is summarized in Table 2.1 and Figure 2.5.[4] The contexts chosen for dating were intended primarily to define the range of dates for each

[3] The revised site sizes used here were calculated from air photos with a digitizing tablet by Timothy Kane of Columbia's Anthropology Department. We would like to thank John Clark of the Geography Department of Hunter College for making this equipment available to us. The data collected only slightly altered prior estimates site sizes, with one regrettable exception. Our estimate of the Wanka II occupational area of the large Wanka I–IV settlement, Hatunmarca, was reduced from 95.4 ha to 73.7 ha. Although this correction did not change the rank position of Hatunmarca in the regional settlement hierarchy, it most certainly affected our estimates of population size and the proportion of the region's population that resided at the community.

[4] The dates in Table 2.1 were calibrated using Stuiver and Reimer's (1993) program. Laboratory errors and the 40-year Southern Hemisphere correction factor were included in the calculations. Because of revisions in the program and our use of correction factors not previously taken into account, some corrected dates reported here differ slightly from previous dates that we reported for the same samples (cf. Earle *et al.,* 1987:79–82; Hastorf *et al.,* 1989:91; Hastorf, 1993:59–65). The differences are minor and do not affect the chronological sequence in any substantive way. In both Table 2.1 and Figure 2.5, aberrant dates that yielded modern radiocarbon ages are not displayed. Figure 2.5 also does not include the Early Horizon date from San Juan Pata listed in the table.

Table 2.1. Radiocarbon Dates from UMARP Excavations, Calibrated for 1σ Brackets

No.	Site	Provenience	Lab ID	Uncalibrated Radiocarbon Age (B.P.)	Calibrated Calendar Date	Phase
0	San Juan Pata	223=A-3/1	RIDDL-1278	2890 ± 80	1127-889 B.C.	EH
1	Pancan	Lvl 3, Loc 422	Pitt-0240	1885 ± 70	79–320 A.D.	EIP/MH
2	Pancan	Lv/ 3, Loc 463	Pitt-0241	1765 ± 50	241-414	EIP/MH
3	Pancan	Lvl 4, Loc. 622	Pitt-0244	1625 ± 35	416–550	EIP/MH
4	Pancan	1=T1 335 BD	RIDDL-1281	1585 ± 70	423–621	EIP/MH
5	Pancan	Lvl 3, Loc 7	Pitt-0239	1575 ± 40	438–610	EIP/MH
6	Pancan	Lvl 3, Loc 504	Pitt-0243	1555 ± 45	450–631	EIP/MH
7	Tragadero Viejo	71 =4-6-6	RIDDL-1277	1550 ± 60	446–640	EIP/MH
8	Pancan	Lvl 3, Loc 482	Pitt-0242	1494 ± 35	556-656	EIP/MH
9	Pancan	1=707/708 (Lv14)	QL-4204	1420 ± 40	632-683	EIP/MH
10	Pancan	1=T1-16	1-12,737	1380 ± 210	539–959	EIP/MH
11	Pancan	Locus 453	QL-4292	1290 ± 40	682–882	EIP/MH
12	Pancan	Lvl 3, Loc 504	QL-4203	1280 ± 40	687–884	EIP/MH
13	Pancan	1=T1 335 BD	RIDDL-1284	1190 ± 110	775–1011	EIP/MH
14	Tunanmarca	7=9-53-1-2-1	QL-4095	1105 ± 25	969–1016	Wanka I
15	Pancan	Lv12, Loc 343	QL-4202	1070 ± 40	976–1034	Wanka I
16	Pancan	1=T5-5-1	I-12,739	1020 ± 80	987–1169	Wanka I
17	Pancan	Locus 21	QL-4289	1000 ± 60	1000–1213	Wanka I
18	Pancan	Locus 42	QL-4290	1000 ± 60	1000–1213	Wanka I
19	Pancan	Locus 166	QL-4291	920 ± 30	1054–1225	Wanka I
20	Ushnu	49=F3-5-1	1-12,736	890 ± 90	1040–1283	Wanka I
21	Ushnu	49=2-6-1	RIDDL-1276	855 ± 65	1166–1286	Wanka I
22	Ushnu	49=2-6-1	RIDDL-1282	854 ± 70	1 167–1289	Wanka I
23	Hatunmarca	2=5-51-2-3-1/10	QL-4004	835 ± 20	1226–1280	Wanka I
24	Hatunmarca	2=3-52-2-13-1	QL-4003	810 ± 30	1230–1288	Wanka I
25	Chucchus	74=1-1-4-2-8/6	RIDDL-1283	750 ± 140	1214–1405	Wanka I
26	Tunanmarca	7=2-54-4-1-2	QL-4094	670 ± 20	1302–1396	Wanka II
27	Chucchus	74=1-1-4-2-8/6	RIDDL-1280	585 ± 55	1316–1438	Wanka II
28	Tunanmarca	7=3-51-0-2-2	QL-4096	580 ± 55	1308–1445	Wanka II
29	Umpamalca	41=1-51-1-3-4	QL-4008	550 ± 50	1398–1449	Wanka II
30	Hatunmarca	2=3-52-0-7-1	QL-4007	520 ± 50	1405–1473	Wanka 11
31	Tunanmarca	7=2-52-2-1-1	QL-4005	485 ± 20	1436–1460	Wanka II
32	Hatunmarca	2=3-54-1-7-1/28	RIDDL-1279	475 ± 70	1420–1622	Wanka II
33	Tunamarca	7=55-1-2-1/2	QL-4006	450 ± 20	1445–1485	Wanka II
34	Umpamalca	41=1-2-2-3-4	QL-4001	440 ± 30	1444–1620	Wanka II
35	Umpamalca	41=F11-3-1	I-12,735	420 ± 75	1438–1644	Wanka II
36	Umpamalca	41=6-53-1-2-1/1	QL-4000	380 ± 30	1478–1644	Wanka II?
37	Umpamalca	41=8-1-1-2-1	QL-4097	410 ± 60	1439–1649	Wanka II?
38	Hatunmarca	2=5-53-2-3-1/9	QL-4002	270 ± 50	1638–1954	Wanka II–III?

[a] Calibrated according to Stuiver and Reimer (1993).

ceramic period. The dates from Pancan (site J1), a small settlement on the edge of Laguna Paca, took advantage of deeply stratified deposits that ranged from the Early Intermediate Period (EIP) into the Late Horizon. Because a main concern for UMARP was change during the Late Intermediate Period (LIP), we also took numerous dates to determine the range of LIP occupations. The inception of the Wanka I phase, or early LIP, corresponds to the upper subsurface levels from Pancan. It is essentially contemporaneous with the earliest date from Tunanmarca (site J7), a series of dates from Ushnu (J47), and the early deposits at Hatunmarca (site J2; see Earle *et al.,* 1987; Hastorf, 1993:61–71). Wanka II, or late LIP, corresponds to the major occupations at the largest LIP sites in the region, probably beginning about A.D. 1350.

Fixing the transition from the LIP (Wanka II) to the Inka era (Wanka III) has been problematical. The Inka occupation is conventionally thought to have begun about A.D. 1460–1470, following the historical chronology devised by the chronicler Miguel Cabello Valboa in 1586 (Cabello Valboa, 195 1; Rowe, 1946:203–206). The last of the ten UMARP dates from Wanka II fits well with that time frame (Table 2.1). Recent re-evaluations of carbon dates from Inka occupations throughout the Andes suggest, however, that the imperial expansion may have actually begun a few decades earlier in the fifteenth century than conventionally estimated (Bauer, 1992; Adamska and Michznski, 1996; D'Altroy, Williams, and Bauer, n.d.). Because UMARP accepted the historical framework for our fieldwork, we took only two carbon dates from Inka-era deposits. One came from the lowest level at the site of Hatunmarca (J2=3-52-0-7-1), with more than 5% of Inka polychrome ceramics in the assemblage. That assay was calibrated, with a lo bracket, to A.D. 1405–1473. Lower levels in the same deposit also yielded a few Inka sherds but not in substantial numbers. The other assay, taken from a storehouse, was calibrated to A.D. 1638–1954. Those two dates alone do not provide the independent dating of Inka or Wanka III occupations needed to pin down the inception of the imperial era. Given the present evidence, however, we are tentatively assuming that the Inka occupation of the region occurred sometime in the first half of the fifteenth century, but a more precise date cannot be fixed at present.

Wanka I (A.D. 1000–1350)

Wanka I was a period of relatively small-scale, nonhierarchical society in the study region. Even so, the evidence suggests that the social history of this era prefigured the radical changes seen in the subsequent phase. Defining the sequence that led up to this period remains difficult, since the chronology is not yet refined enough to permit separation of the EIP from the Middle Horizon, a time of major developments elsewhere in the Andean sierra. The Middle Horizon (ca. A.D. 500–900) was generally tied to the period when the urban center Wari in the Ayacucho basin began to dominate the central Andes (Schreiber, 1992). The Wari presence in the Upper Mantaro is clearest in the southern valley, at Wari Willka, which was an also oracular center in the Inka and early Colonial periods. Drawing on perceived settlement shifts in nearby sites, Browman (1970) has suggested that Wari dominated the entire region. Nonetheless, UMARP found no evidence to sustain the idea that a Wari presence had a significant effect on life in our more northerly study zone; only three Wan-related sherds were among the more than one million fragments studied by the project.

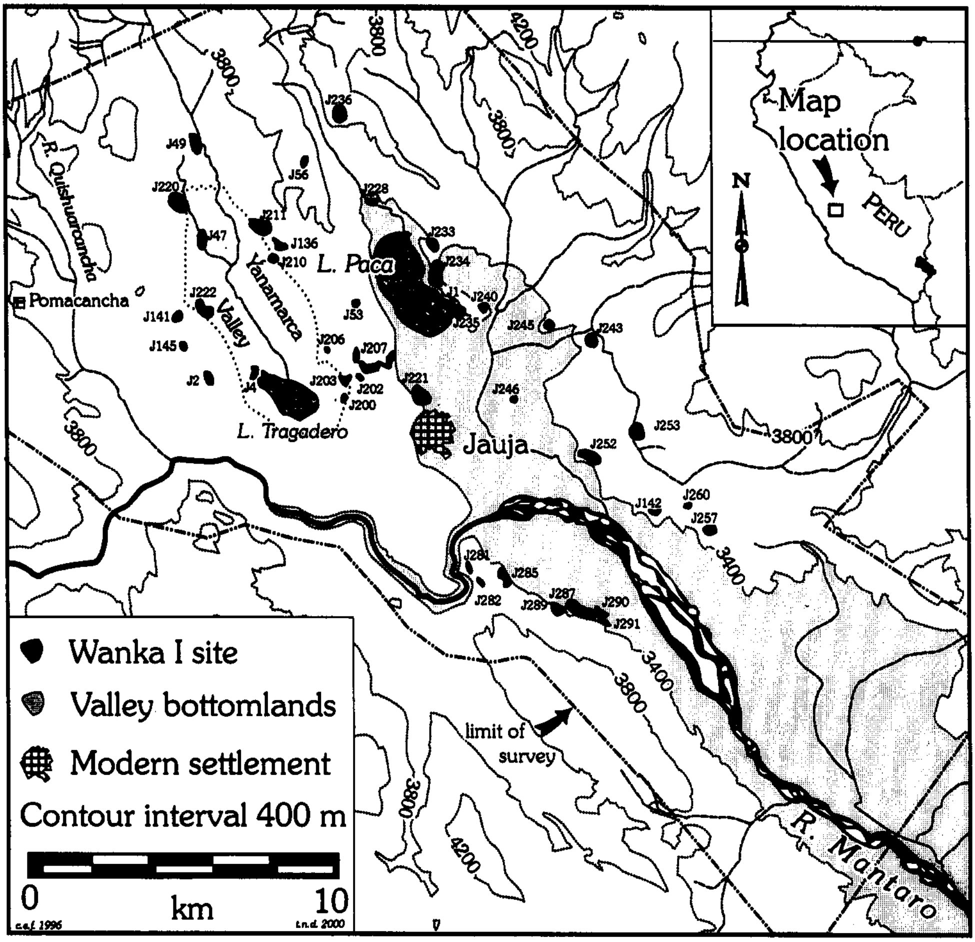

Figure 2.6. Wanka I (A.D. 1200–1300) settlement pattern in the Upper Mantaro Valley.

The 43 sites identified for the Wanka I phase were dispersed across the range of environmental zones, including the main valley bottom, the adjacent hilltops, the tributary drainage and internally draining Yanamarca Valley, and the upper-elevation rolling hills, grasslands, and hilltops (Figure 2.6). There is no evidence of a significant concentration of population, since the sites tended to be small, ranging from 0.7 to 11.1 ha, with a mean of 3.4 ha. Among the most important changes that could be recognized from the preceding Early Intermediate Period/Middle Horizon (EIP/MH) was a tendency for sites to become more clustered. No strong settlement hierarchy was yet present but an increase in site size and differences in site scale in the Yanamarca Valley suggest that political relations may have been consolidating. Although Wanka I sites are poorly preserved, the existing architecture indicates that the size of residential structures decreased somewhat from the EIP/MH, at the same time that the density of household compounds within sites increased.

The artifactual data from the era also suggest that social changes were underway. Wanka I has been identified primarily on the basis of new ceramic styles, notably Mantaro Base Clara, purple on buff, and purple on orange (cf. Browman, 1970). LeCount's (1987) analysis of the ceramic assemblages shows that there was increased variety in the range of surface treatments and bowl sizes. At the same time that there was a restriction in paste and temper types, the distribution of vessel types tended to be limited to single drainages. As Hastorf (1993:64) points out, this evidence suggests the increased development of local alliances, especially when coupled with the settlement data. Russell's (1988) analysis of the lithic and groundstone assemblage similarly shows significant changes in the subsistence activities pursued by the Wanka I populace. The most important change in the chipped stone assemblage was an increase in the manufacture of blades that were probably used to harvest grains, legumes, fuel, and fodder. The increase in the density of chipped stone hoes, for example, implies that the Xauxa were adopting more labor-intensive agriculture practices, probably in valley bottom lands (Hastorf, 1993:64).

Wanka II (A.D. 1350–1450)

Radical changes in social organization took place in the Mantaro region shortly before the lnka conquest. A rapidly growing population became concentrated in incipiently urban communities that were situated and constructed defensively. Thirty-eight sites have been recorded for the entire UMARP survey region (Figure 2.7). The total population estimated for those settlements fell between about 37,000 and 61,000 (at 60–100% occupation). Because the occupational density at Wanka II settlements was high, we estimate that the actual population probably fell close to the upper end of this range. More detailed descriptions of key sites are presented in Chapters 4 and 7, but a synopsis here will help set the research context.

Like their immediate ancestors, the Wanka II people were farmers and herders. In the Yanamarca and main Mantaro Valleys, however, productive valley bottoms were abandoned, while large, fortified towns were built on hill crests on the west side of the Yanamarca. The shift to higher elevations restricted the range of easily accessible productive zones, so that there was an increased emphasis on tuber and highland grain cultivation (Chapter 7, this volume; Hastorf, 1993). Wanka II sites were typically encircled by massive stone walls and the main residential sectors at the largest sites were additionally protected. Most sites were built on ridge crests with springs. In the Yanamarca Valley, Hatunmarca (J2; 73.7 ha of occupational area) and Tunanmarca (J7; 23.1 ha) dominated the region's settlement hierarchy. On the west side of the Rio Quishuarcancha, Llamap Shillón (J109; 31.4 ha) was the principal settlement, but no single Wanka II site dominated the main Mantaro Valley. Despite their scale, little or no public architecture is preserved even at the largest sites. Instead, they consist largely of residential sectors comprising hundreds of architectural compounds. The compounds, or *patio groups* in UMARP terminology, contain fieldstone *(pirka)* houses and patio areas, enclosed by stone walls. The compounds themselves are grouped into larger sectors that may have corresponded to residential neighborhoods.

The Spaniards recorded oral histories purported to describe this era, most notably a series of interviews conducted in 1570 by Viceroy Toledo (1940a, 1940b, 1940c), which were intended to probe the nature of society before the Inkas and the transformations

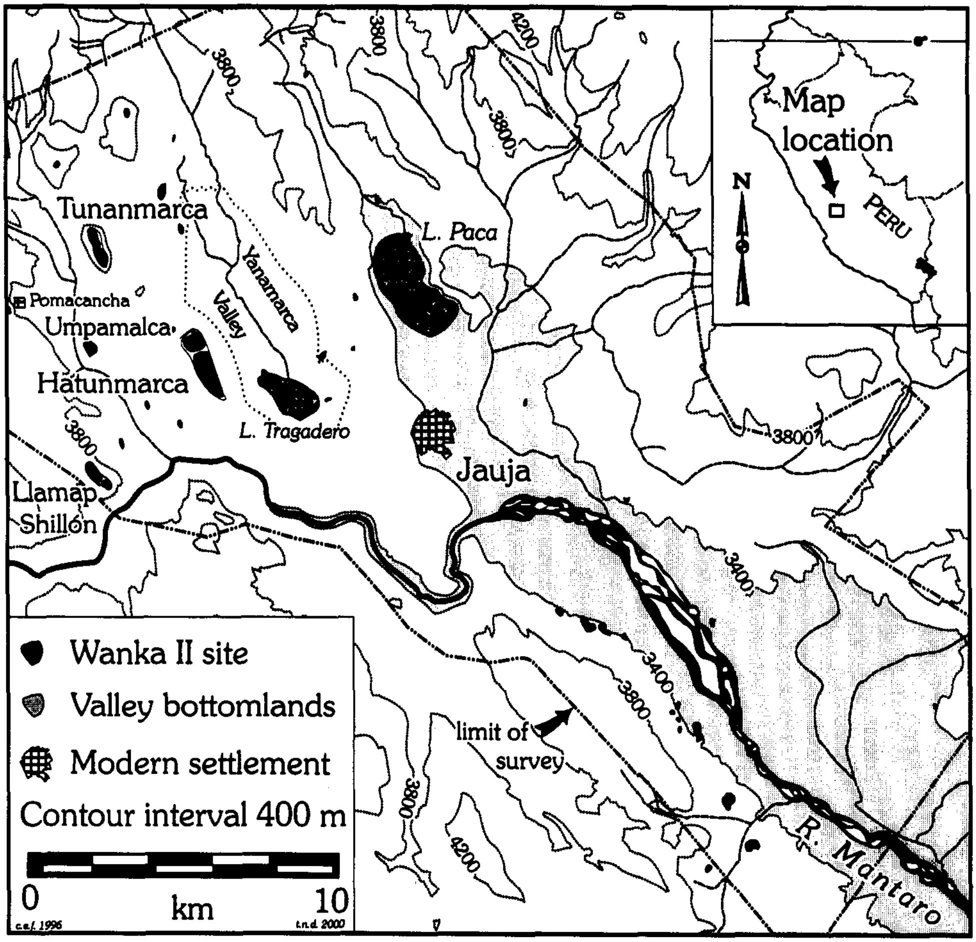

Figure 2.7. Wanka II (A.D. 1300—1450) settlement pattern in the Upper Mantaro Valley.

wrought by imperial rule.[5] According to the sources, the valley was occupied by two major ethnic groups just before and during Inka dominion (Vega, 1965). The Xauxa occupied the northern part of the valley and its immediate environs, including the Yanamarca Valley and the entire UMARP study region. The more southerly Lurinwanka *(Lower* or *Inner Wanka)* inhabited the central part of the valley, and the Ananwanka (Upper Wanka) occupied the south. Ananwanka *saya* (provincial subdivision) also seems to have assimilated at least one other named *etnía* (ethnic group), called the Chongos (Vega, 1965: 168-69). Collectively,

[5] Part of the Spanish purpose in obtaining this testimony was to discredit the legitimacy of Inka rule. The native elites who provided the testimony also had in mind their own interests in rendering and bending the truth as the they saw it, or withholding information. As such, we need to be careful in accepting the veracity of any specific account, but can use a range of independent sources as the basis for drawing a general view of the times.

the populace was often referred to as the Wanka (or Huanca) in the early Colonial era (e.g., Cieza de Leon, 1984:Ch. 84, p, 242).

The sources suggest that the Xauxa and Wanka existed as discrete *etnías* before the Inka conquest, but that none was fully unified during the LIP.[6] Spanish chroniclers often commented that differences in dress style and group names distinguished the groups from one another (e.g., Pizarro, 1986:Ch. 13, p. 75; Cieza de Leon, 1984:Ch. 84, p. 242; Garcilaso de la Vega, 1966:Vol. 2, Bk. VI, Ch. 10, p. 206; Guaman Pomade Ayala, 1980:/435[437]/ p. 403). The Inkas, in fact, insisted that each group wear its own distinctive costume, as a way of keeping tabs on members of the diverse subject societies (Cobo, 1979:Bk. II, Ch. 24, p. 196). When native witnesses testified to Spanish authorities, most identified themselves primarily according to their kin groups, but the most prominent elites also used larger named group affiliations. The persistence of differences among local groups may be seen in linguistic patterns, which suggest that the inhabitants of each of the three subregions spoke a distinct branch of Wanka Quechua, a situation that is preserved today (Cerrón-Palomino, 1972, 1977).

Indigenous society in the Upper Mantaro, as in many areas, was based on the *ayllu,* a corporate kin group that held resources in common. Membership in an *ayllu* was usually inherited bilaterally and conferred use rights to resources. The scale of these groups varied markedly from one to the next, but the largest could contain hundreds of households. They could be flexible in their definition, in part to ensure group endogamy and subgroup exogamy. In late prehistory, the *ayllu* contained divisions that in some contexts were treated as equivalent in status and in others were ranked. The divisions usually formed moieties called *Hanan* (upper) and *Hurin* (lower), but quadripartite or tripartite groupings were also present. *Ayllu* contained named lineages, which could also be ranked with respect to one another. In some modern highland communities, the members of distinct *ayllu* live in discrete neighborhoods (Isbell, 1978), a situation that may have also existed in prehistory. The *ayllu* thus exhibited several features characteristic of Andean societies: division of larger social groupings into multiple subgroups, opposition of groups, and hierarchy.

Both archaeology and history thus indicate that Wanka II was a time of dynamic political change. Political competition, outright warfare, demographic shifts, and ceremonial hospitality combined to redefine increasingly complex political formations. The scale of larger sociopolitical groupings varied markedly in the central Andean LIP. In the Mantaro Valley, the largest unified group described in the documentary sources encompassed perhaps half the Ananwanka, that is, roughly 30,000 people (see below). Polities that sizable were probably much larger than most in the Peruvian sierra. The largest unified polities of the neighboring Asto, Yauyos, and Tarma peoples, for example, likely contained no more than a few thousand people (Lavallée and Julien, 1983; Hastings, 1985).

The evidence also indicates that conflict was crucial to population nucleation and the development of political hierarchies. According to Toledan inspections (Toledo 1940c:8–34), political relations before the Inkas were dominated by *zinchi* (valiant men), who fostered conflict to gain lands, herds, and women for themselves and their adherents. Over time, the *zinchi* reportedly also took on the role of leader during peacetime. Granted

[6] For more extended reviews, see LeVine (1979), LeBlanc (1981), D'Altroy (1987, 1992:47–70), and Hastorf (1993:64–69).

that the accounts have legendary elements, the oral histories are compatible with the settlement evidence that shows a concentration of the Wanka II populace in defensive sites.

Turning to economics, Andean scholars have emphasized that exchange relationships between individuals and groups were essential to the fabric of social life. Those scholars generally conceive of household and corporate decision making as having been focused around manipulation of customary relationships within stable social structures. As Sikkink describes (Chapter 5, this volume), the notions of reciprocity and redistribution are frequently used to characterize the kinds of exchange relationships present at the time as the key means by which traditional societies organized their economies (cf. Murra, 1980; Polanyi, 1957). Reciprocity is conceived in two forms: balanced and asymmetrical. The ideal form of balanced reciprocity is *waje waje,* in which households of equal status exchange services in expectation of a return of equivalent value (Fonseca Martel, 1974; Stanish, 1992:24). Asymmetrical reciprocity, or *minka,* takes forms such as the services provided to in-laws or contributions of agricultural labor to upper-status by lower-status households that expect to share in the produce. In *minka* exchange, inequality between the parties is the key to defining the nature of the exchange.

Andean redistribution is usually treated as consisting of two central elements. The first is the elite's provisioning of certain kinds of material goods and edibles, especially cloth and *chicha* (beer, usually made from maize), to the subordinate populace as part of the elite's obligations to his group (e.g., Wachtel, 1977; Netherly, 1978; Rostworowski de Diez Canseco, 1999). The second consists of elite allocation of particular resources, such as coca and pepper, to the general populace (Murra, 1972). In each case, the goods often produced by specialists working directly for their lords were distributed through ceremonial hospitality. That kind of largess was not a substitute for subsistence production or market relations. Instead, it bonded sociopolitical groups, reinforced unequal statuses, and provided commoners with goods that might otherwise be difficult to obtain. In the volatile pre-Inka era, the ceremonial distributions likely also served to attract followers to the more powerful elites or groups, thus providing a means of restructuring political relationships.

This sketch emphasizes that the inhabitants of the Mantaro Valley had their own history of alliance building and developing hierarchy before the lnka arrived. They were not alone in that situation, for similar ethnic consolidation occurred throughout the central Andes after the Middle Horizon. But what dynamics were involved in the increasing political inequality? Although the larger polities to the south surely had an indirect impact on the Xauxa, it was the daily practices of the households and communities that led to the changes, causing the populace to move up onto defended knolls, conduct frequent local skirmishes, and promote leaders (Hastorf, 1993). It seems likely that some leaders began to manipulate rules that benefited many people but also gave individuals an advantage. That, in turn, led to new activities of prestige, social display, or access to goods and labor decisions. Unlike some aspects of power in empires, the smaller-scale political situation tends to be best investigated at the domestic level, where individuals acting among themselves met their needs and altered their actions within their homes. By focusing on the domestic economy within a historical setting, we can begin to see shifts in the control over others' labor, increased political displays, evidence of differential access to high-status items, and/or the concentration of decision making.

Wanka III (A.D. 1450–1533)

According to the most widely accepted documentary account, the Inka expansion began about A.D. 1438, when the Inkas rebuffed a Chanka attack on Cuzco (Cabello Valboa, 1951; Rowe, 1946:203–209). The leader of the Inka resistance, lnka Yupanki, usurped the throne from his father, Wiraqocha Inka, and assumed the honorific name Pachakuti, which may be glossed as "Cataclysm." Under Pachakuti's leadership, the Inkas reportedly dominated the Cuzco Basin, the southern highlands of Peru to Arequipa, and the Lake Titicaca region, and made their first venture to the central Peruvian coast. According to that chronology, Pachakuti ceded titular military leadership to his son, Thupa Inka Yupanki, ca. A.D. 1463. Largely under the seasoned direction of Thupa Inka Yupanki's elder kin, the Inkas conquered to the central Ecuadorian sierra, penetrated to the coast, and may have made at least one sortie into the montaña. After Pachakuti's death, Thupa lnka Yupanki's armies expanded the domain through Bolivia as far south as northwestern Argentina and northern Chile. The next ruler, Wayna Qhapaq, oversaw expansion of the empire in the northern Peruvian montaña and Ecuador. Two of his sons, Waskhar and Atawallpa, engaged in a five-year civil war that ended just as the Spaniards arrived in 1532. Because the Xauxa and Wanka had sided with Waskhar's losing side, they readily allied themselves with the European invaders and helped overthrow the entire empire (Hemming, 1970; Espinoza Soriano, 1971).

According to this chronology, the Inkas occupied the Upper Mantaro Valley early in the second half of the fifteenth century. The sources disagree, however, over whether the conquest took place before or after Thupa Inka Yupanki assumed command of the armies. Some chroniclers recorded that the conquest occurred under the direction of Qhapaq Yupanki, during Pachakuti's rule (e.g., Sarmiento de Gama, 1960:Ch. 38, pp. 242–243; Polo de Ondegardo, 1917:115; Cieza de León, 1967:Ch. 57, p. 187). The Wankas told Viceroy Toledo that Thupa Inka Yupanki himself had led the armies of conquest, a version supported by witnesses in Huamanga (Toledo, 1940c: 19, 24, 32; Toledo, 1940b:40, 44) and made in 1569 by the ruler's descendants (Rowe, 1985). Considering that the sources often ascribed titular military command to individuals who later became paramounts, these two versions may not necessarily be contradictory. In either case, the documents report that only the northernmost residents of the region had vigorously resisted the Inka advance. One apparent consequence of that resistance was the forced abandonment of a number of northern communities (Espinoza Soriano, 1969, 1971).

Despite a long-term consensus over the basic sequence of the expansion, some persistent doubts exist about the timing of events and the roles played by particular individuals. Andean peoples lacked a written language and themselves observed that history was molded to suit political ends. As a consequence, the royal epics that were told to the Spaniards varied in significant ways (e.g., Zuidema, 1990; Urton, 1990). This is not the place to explore the issue in depth but it is important to note that there are both archaeological (radiocarbon) and historical reasons to have concerns about the oral histories. For this volume, it seems reasonable to accept that the Wanka II phase lasted into the fifteenth century and the Inka empire endured about a century.

After taking over the Upper Mantaro, the Inkas oversaw the construction of a major center at Hatun Xauxa (J5) and an infrastructure of roads and several small road posts (e.g., J6, 545; Figure 2.8). Hatun Xauxa was renowned as one of the most important half-dozen provincial centers in the empire. The Spaniards who entered the valley in 1533 reported that it was a grand, well-planned settlement, with a large main plaza (Estete, 1917:96–97). Visitors in later decades, drawing on the memories of local residents, described capacious thatched-roof buildings, resident artisans, and a sequestered compound for *aqllakuna,* unmarried females who worked for the state making cloth and *chicha* before being awarded in marriage to favored individuals (Cieza de León, 1984:Ch. 84, pp. 242–243). The current surface remains, which cover about 48.4 ha, provide meager evidence of such a grand settlement. The partially reconstructed main pyramid platform, fragments of only 14 buildings, and a few terraces are still visible, scattered among the houses of modern Sausa (D'Altroy, 1992: 102–116). The valley's well-preserved storage complexes were the most

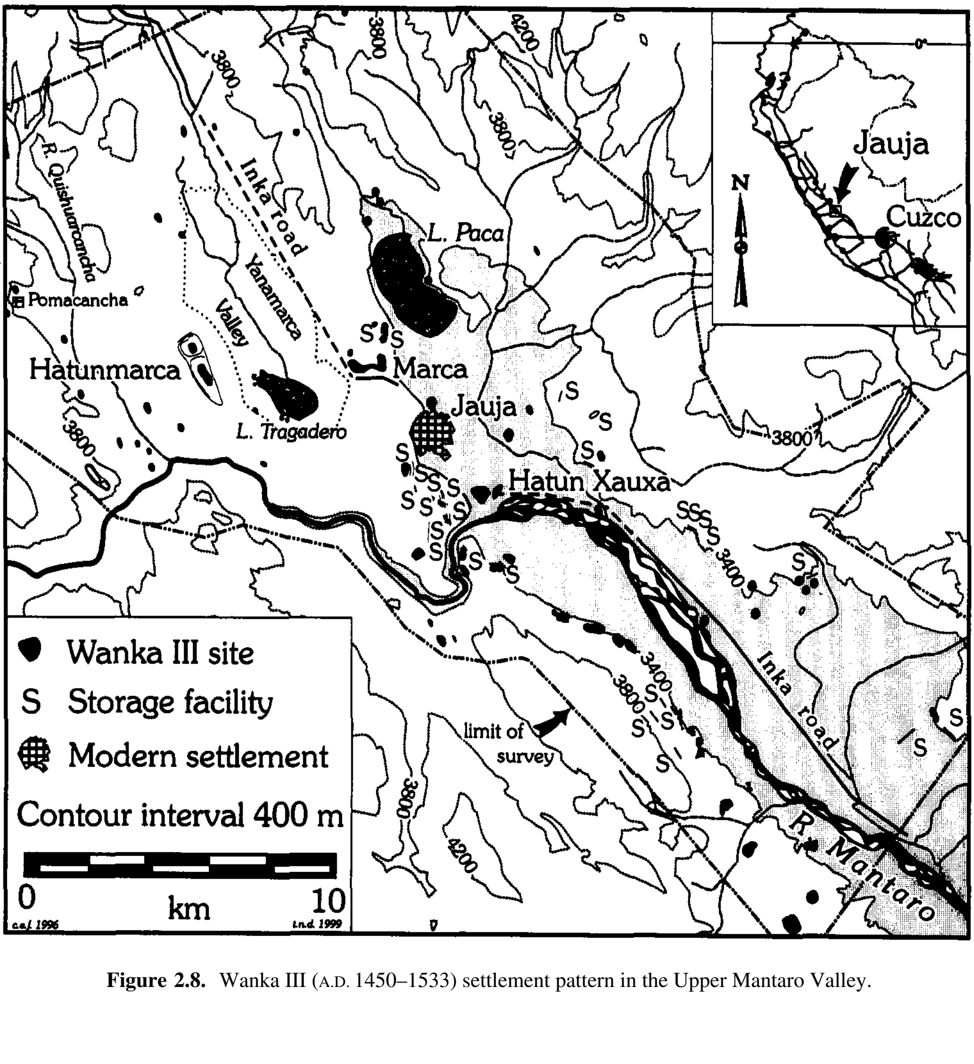

Figure 2.8. Wanka III (A.D. 1450–1533) settlement pattern in the Upper Mantaro Valley.

capacious yet recorded in the provinces. In the northern part of the valley alone, they held an estimated 123,716 m^3 of usable space. Many buildings were dedicated to foodstuffs from the rich farmlands near the center; however, Inka storehouses contained everything from military supplies, such as weapons, clothing, and sandals, to the raw materials for sumptuary items, such as bird feathers (Morris, 1967; LeVine, 1992).

Under Inka rule, the life of the local populace changed in many ways. A significant shift was the movement of many people from their hilltop redoubts, such as Tunanmarca, Umpamalca, and Llamap Shillón, into smaller communities along the low hills flanking the valleys. The largest sites, notably, Tunanmarca, were either abandoned or substantially reduced in scale. Hatunmarca decreased in residential population from an estimated 6,600–11,000 to 2,500–4,100, and a new major town of comparable size arose at Marca (Chapter 4, this volume). In making this shift, the people moved away from the high-elevation lands most suited to tuber cultivation and into lower expanses amenable to maize agriculture (Hastorf, 1993; Chapter 7, this volume).

In 1582, elites from the valley reported to the Spanish *visitador* (inspector) Andrés de Vega that the last Inka census had recorded 6,000 "war Indians" from Hatunxauxa, 12,000 from Lurinwanka, and 9,000 from Ananwanka (Vega, 1965:167). Investigators have interpreted these figures to constitute different segments of the region's population, ranging from one-fifth to one-ninth of the populace (Rowe, 1946; Smith, 1970; Cook, 1981). In our work, we have accepted a middle figure and estimate that the entire population of the valley lay somewhere between 150,000 and 200,000 individuals in the 1520s.

The state's resettlement program had some effect on the ethnic constitution of the region's population and perhaps on its size as well. Colonists from the Cuzco, Collaguas, Kañare, Chachapoyas, Yauyos, and Huamanga regions were brought in, and Xauxas or Wankas were removed to the Quito, Vilcashuaman, and Cuzco areas, among others (D'Altroy, 1992:187–188). Regrettably, we have not yet been able to fix the scale, responsibilities, or residential locations of the newcomers to the Upper Mantaro.

The political constitution also changed notably with the inception of Inka rule. The state centralized regional politics into three provincial divisions (Hatunxauxa, Lurinwanka, and Ananwanka), each headed by a local hereditary lord. Local elites were appointed state officials, primarily in the decimal administrative hierarchy. They were charged with administering state directives, such as agricultural or military mobilization, from a specific number of households. It is important to recognize that the lower-ranked state offices (e.g., *pachaka kuraka,* or lord of 100 households) oversaw groups that were much smaller than the largest indigenous social groups. Thus, even though access to state office was effectively inherited among male relatives within kin groups, the offices themselves penetrated existing structures. In this sense, the Xauxa and Wanka peoples were much more intimately integrated into state rule than were societies elsewhere (e.g., the Peruvian north coast, highland Ecuador), where the Inkas ruled more indirectly through subject paramount elites or colonists.

THE INKA STATE ECONOMY

Inka rule created a demand for goods and services to sustain state personnel, to underwrite relations between Cuzco and its subjects, and to provide estates for the ruler and select aristocrats, When they annexed a people, the Inkas claimed ownership of all resources and ostensibly divided them among the state, the state religion, and the subject communities. Despite a notion of equivalent divisions fostered by Garcilaso de la Vega's apology for the Inkas, local communities probably retained most of their lands in many areas. The state government seems to have commanded more resources than did the church in most regions, although some provinces contained large tracts devoted exclusively to the Sun. In some areas, including the Upper Mantaro, a notable fraction of productive resources, especially farmlands, was alienated from zones that were underused in the LIP.

The Inkas often appropriated lands around major state installations while designating other areas for state production (La Lone and La Lone, 1987). On the basis of the distribution of agricultural lands, settlements, and storage facilities, I have argued that much of the northern Mantaro Valley, especially within 5 km of Hatun Xauxa, was likely reserved for state farms (D'Altroy, 1992:154–163). Elsewhere, the entire native populace was resettled to clear the way for state production at state farms, for example, in the western part of the Cochabamba Valley in Bolivia (Wachtel, 1982). Over time, the Inkas also set aside estates for the royal kin, especially in the Urubamba drainage near Cuzco (Rostworowski de Diez Canseco, 1988; Niles, 1987, 1999; Protzen, 1993; Rowe, 1997). The estates in heartland are especially renowned for their elegant terracing and irrigation systems. In the provinces, the emperor claimed vast areas as his personal estates, as did Waskhar in the Huánuco region just before the Spanish invasion (Julien, 1993).

The state economy produced both staple and prestige items. In the staple sector, goods and services were procured either as products of labor or through attached specialists. The sumptuary sector produced the goods used to support sociopolitical links and ceremonial activities. Morris (1982) has suggested that Inka rule was fueled by ceremonial hospitality and reciprocity, building on previous social institutions, rather than by civil or coercive relations. Murra (1975, 1980) has shown how the Inkas depended heavily on *mit'a* labor to produce goods and provide services for state needs, especially in the empire's early years. In exchange for that labor, the Inkas allocated access to agricultural and pastoral lands back to the communities but retained a monopoly or strong control over many wild and mineral resources, notably, metals. State officials also provided food and drink, in addition to goods granted for specific services, such as the sandals and clothing annually allocated to soldiers. The labor tax was assessed to households according to periodic censuses, through local leaders retained in positions of authority or appointed by the state. Goods were produced for the state in the households of the peasantry in traditionally specialized communities and in new state settlements. For instance, the women in many families were given wool from state herds annually and were required to weave cloth from it, the rationale being that the household gave only its labor, the materials having been supplied to it (Murra, 1962; Costin, 1993).

Some chroniclers have left us itemized lists of labor service due the state (e.g., Falcon, 1946:137–140; Murúa, 1987:Bk. II, Ch. 21, pp. 402–404; Guaman Poma de Ayala, 1980:/191[193], p. 183). Falcón specified thirty-two categories for coastal societies and thirty-seven for highland populations, not counting the two kinds of taxes that likely demanded the greatest input—agricultural labor and military service. Among the coastal categories were specialists responsible for human sacrifice; miners; people who worked with stones, colored earth, and salt; artisans, including weavers, sandal makers, potters, woodworkers, and masons; guards for Women of the Sun, priestesses, llamas, and storehouses; coca farmers; and fishermen. Additional kinds of highland specialists included individuals who served the bodies of the deceased Inkas and artisans who made earspools and cords of lead played with by the emperors. In Spanish inspections of 1549 and 1562, members of the Chupaychu ethnic group of the Huánuco region reported having fulfilled thirty-one distinct duties for the Inkas, which correspond fairly well with the chroniclers' general lists (Helmer, 1955–1956; Ortiz de Zúñiga, 1967, 1972). Analyses of these duties suggest that obligations were at least partially tailored to the resources available locally (see C. Julien, 1982, 1988; LeVine, 1987; D'Altroy, 1994).

Murra (1975, 1980) has argued persuasively that the range of labor owed the state became elaborated and more specialized over time. As the Inkas shifted their policies of rule away from expanding their territories and toward consolidating control, they developed specialized productive institutions less oriented to reciprocity. Craft enclaves were developed both within major provincial centers and at rural communities established for specific purposes of producing goods, such as weaving, for the state. Settlements were also created to mine metals and stones, especially in the southern half of the empire; these materials may have provided the principal rationale for the region's annexation (González, 1983; Raffino, 1983).

The most important productive specialists were the previously mentioned *mitmaqkuna,* the *yanakuna,* and the *aqllakuna* (see Rowe, 1982). The first of those were whole families or communities resettled by the state in new areas for military, economic, and political ends (see, e.g., Espinoza Soriano, 1973, 1987; Lorandi, 1991). The most elaborate provincial centers, where many specialists worked, punctuated the imperial road between Chucuito and Quito—Hatunqolla, Vilcashuaman, Hatun Xauxa, Pumpu, Huánuco Pampa, Cajamarca, and Tumipampa (Hyslop, 1984, 1990). That strip contained both the cultures and environments most similar to those of the Inkas themselves, which may have expedited their intensive assimilation. Both internal garrisons and frontier forts were also staffed by *mitmaqkuna.* They were used to grow maize, coca, and peppers, and to make craft items of metals, textiles, and ceramics. To date, however, we do not have any documentary evidence for specific kinds of *mitmaqkuna* producers in the Upper Mantaro Valley, although Cieza de Leon (1984:Ch. 84, p. 243) and Estete (1917:97) commented that metalsmiths and woodworkers had been present at Hatun Xauxa.

The *yanakuna,* individuals detached from their kin group and community, were assigned to serve the state or aristocrats on a lifelong basis. Among their responsibilities were agricultural duties and house service for the elites, although they could hold managerial positions as well. Although sometimes termed slaves by later commentators, *yanakuna* could attain positions of high status within the imperial administration. The last labor category—the *aqllakuna*— consisted of young women removed from their families and assigned to live in segregated precincts within state installations (Morris and Thompson, 1985:92). There, they wove cloth and brewed *chicha* until awarded in marriage to men honored by the state.

Given its extractive, productive, and distributional roles, the creation of the political economy had the potential to affect domestic economics in most households directly. With respect to extraction, the general populace provided much of the labor to produce state goods, while some state duties, such as spinning, were performed within subject households. As for consumption, *mit'a* laborers constituted a significant fraction of the consuming population and the status of native elites was supported in part by privileged access to state goods. Important as those general features were in organizing the state economy, it must be emphasized that the Andean landscape and its societies were enormously diverse, a situation that fostered considerable variety in the state economy tailored to local circumstances. In view of this complexity, the effects of Inka on the Upper Mantaro could not be understood solely by recourse to general models or normative descriptions. Instead, we needed access to detailed, hard evidence of production, exchange, and consumption.

THE RESEARCH QUESTIONS: CHANGES IN THE DOMESTIC ECONOMY UNDER INKA RULE

We may now turn specifically to the research on the domestic economy conducted by UMARP in 1982–1983. From a theoretical perspective, we needed to set out a clearly defined set of research questions that could be addressed concretely with archaeological data. Our approach entailed focusing on three basic elements of domestic economic activity—consumption, production, and exchange, each broken down into more specific questions (Table 2.2; Earle *et al.,* 1987:2–4). The methodological element entailed devising means of collecting data that were both directly pertinent to these activities and representative of a cross-section of society. To those ends, we established the Wanka II era as a comparative baseline for each issue and then evaluated change and continuity in Wanka III, the period of Inka rule.

Consumption

The first questions concerned the consumption of subsistence and craft goods by the members of households in Wanka II and the changes that occurred after the advent of the Inkas. We were interested in describing the basic patterns of household use of foods, tools, and prestige goods that existed during the period of Xauxa autonomy, from which we could that the more elite members of Wanka II society had enjoyed a superior diet, a difference that we expected to have increased when they were drawn into the Inka administration. The diet was assessed through study of floral and faunal remains, and stable isotope analysis of human bones and food remains (Hastorf, Chapter 7 and Sandefur, Chapter 8, this volume).

Generally speaking, we expected only modest differences between the upper and lower social statuses in Wanka II in the basic suites of utilitarian household items, given the prevailing ideal of household self-sufficiency. We expected differences to be evident both in the activities conducted and in the quality of goods that were used. Elites were more likely, for example, to have had access to large serving vessels associated with their roles as sponsors of political festivities. Similarly, their elevated status would have given them preferred access to labor-intensive and exotic goods. We anticipated finding an increase in the distinction in Wanka III, as elites gained access to a wider variety and higher quality of goods under imperial rule. Evaluation of access to craft goods was thus based on an assessment of both the basic suites of ceramics, lithic and bone tools, metals, and a more limited array of sumptuary items made, for example, from semiprecious stones, metal, and shell.

Table 2.2. Summary Research Questions of the 1982–1983 Study

Consumption

1. What diet characterized the Wanka II household, and how did it change in Wanka III?
2. What craft items were used by the Wanka II household, and how did their distribution change in Wanka III?

Production

Topic 1: Household production for private use.

1. What subsistence activities characterized the Wanka II domestic unit, and how did they change in Wanka III?
2. Which craft items were produced by all Wanka II household for their own use, and how did this change in Wanka III?

Topic 2: Specialization of production for exchange.

1. Did attached specialists produce special goods for the elites, and is there evidence for an increase in this specialization from Wanka II to Wanka III?
2. Did the amount of independent specialization increase from Wanka 11 to Wanka III?

Exchange

1. Did exchange increase from Wanka II to Wanka III?
2. Did the residents of elite compounds have preferred access to exchanged goods in Wanka II and Wanka III?
3. Did the quantity of exotics in elite compounds increase from Wanka II to Wanka III?

As data analyses progressed, we refined our conception of consumption as a social phenomenon (cf. Rutz and Orlove, 1989). The deposition of remains that we initially treated as resulting from consumption may have combined actual household use, access to or storage of materials for disbursement within the compound to nonhousehold members, and processing for use elsewhere. The literature on depositional processes is extensive, and we do not propose an extended discourse here. We do, however, wish to underscore our recognition of both the taphonomic and social dimensions of the problem. We have also attempted to distinguish between casual and deliberate discard of materials in the household, in recognition of the fact that some materials were inadvertently lost within the household (e.g., decorative silver disks, cooking spills), whereas others were intentionally deposited (e.g., trash in pits, burials). These and related issues are examined by the authors of individual chapters for their own data sets.

Production

The second research area concerned the organization of household labor for production of subsistence and craft goods. From a theoretical perspective, we were concerned with both generalized household production for private use and specialized production for exchange.

As described earlier, the early documents emphasized the self-sufficiency of local groups. Each household ostensibly had access to a full range of community-held resources, although households collaborated on basic agricultural and herding tasks. Full household self-sufficiency was more an ideal than actuality, but the notion of households being primarily responsible for their own material well-being is well grounded.

A major concern for UMARP thus revolved around defining the baseline organization of production by households for their own use. We were most interested in determining the nature of subsistence and food procurement activities and of casual craft production. We expected all households in Wanka II and III to have been involved to some degree in agricultural production, measurable through the distributions of such tools as hoes, digging stick weights, and chert blades. Similarly, we expected most households to exhibit textile manufacture, recognizable through the presence of spindle whorls and bone tools. Casual tool manufacture, especially in lithics, was also anticipated, recognizable through the presence of raw materials, manufacturing tools, and debitage. Because traditional social groupings, such as the *ayllu,* were often ranked internally and externally, we expected gradations in the intensity of or balance among these household activities. Elite households especially were expected to exhibit distinctive features deriving from their roles as sociopolitical and military leaders in Wanka II.

We anticipated that these differences would have been exaggerated under Inka rule because local elites co-opted into state administration were entitled to numerous perquisites. Many of those, such as access to special goods, would have had direct impacts on the domestic economy. In addition, we anticipated changes in household labor organization from the addition of personnel, such as multiple wives and household servants (Cobo, 1990:Bk. II, Ch. 7, p. 204–205). Less obvious were the consequences of relief from labor service to the state. Assessing the implications of the changing composition of the labor force for generalized household production was thus a challenging problem. We felt that the consequences of a changing labor force could be more readily delineated for production by attached specialists, the next aspect of our study.

Specialized production is a pervasive phenomenon. Differentiation and interdependence—two features of specialization—can be recognized along a continuum from the domestic activities to the modem industrial economy (Brumfiel and Earle, 1987:5; Costin, 1991). It is an anthropological given that even the simplest societies exhibit divisions of labor according to sex, age, and personal capabilities. The pivotal issue for archaeologists concerns the ways in which specialization was related to developing social complexity in prehistory. Clark and Parry (1990) usefully distinguish between two viewpoints. An early view saw specialization as apurposeful, creative force and emphasized the role oftechnological innovation in social progress (e.g., Childe, 1951 ; cf. van der Leeuw and Torrence, 1986). A later perspective saw specialists arising from positions ofeconomic marginality which forced them to specialize and exchange for survival (e.g., Arnold, 1975, 1985; Fry, 1980; Binford, 1983). The second perspective focuses especially on craft production as a consequence of material shortfalls at the household level.

The assumptions underlying these two views are not mutually exclusive. When we began our research, it seemed probable that there were multiple causes for different kinds of specialization, each contributing in distinctive ways to increasing social complexity. UMARP's initial conception of the problem built on Earle's (1978) distinction between independent and attached specialists. The former produce goods or provide services for a general demand crowd, whereas the latter provide goods or services to a patron, usually a social elite or governing institution (Brumfiel and Earle, 1987:5; cf. Trigger, 1974). Each kind of specialization is organized by its own principles and is found in distinct social contexts, The first is driven by economic concerns, and the latter more by sociopolitical demands. In part because they differ in their products, intensity, organization, and productivity, both kinds of specialists can be found in the same society (Brumfiel and Earle, 1987:5).

In our research, we considered it likely that both kinds of specialized production contributed to the nature of prehistoric society in the Upper Mantaro. We expected little independent specialization in Wanka 11, a time in which we felt that the ideal of household and community self-sufficiency would have been most nearly attained. In contrast, we expected a significant increase in specialized production at the household level under Inka rule because of state demands and the opportunities afforded by the imposed peace. Many of the conditions of life under the Inkas nonetheless favored continuity in household production. There was an enduring emphasis on the household, headed by a *hatun runa* ("big man"), as the basic socioeconomic unit for Inka census and tax purposes. Most householders under the Inkas were still farmers, herders, or both. We therefore did not expect increases in independent specialization to have reconfigured the domestic economy.

Attached specialization was of particular interest because of its apparent importance in underwriting political relations among societies of moderate complexity, such as those emerging in Wanka II. Studies of chiefdoms, such as in Hawaii, indicated that the production and distribution ofwealth and ceremonial goods are typically controlled by social elites as a means of reinforcing their status (Earle, 1978, 1997). Because the evidence suggested that Wanka II society was becoming more complex, we expected to find that the elites were underwriting production of fine crafts that were used to affirm or intensify social distinctions (e.g., fine metals, textiles, and pottery). We also postulated that attached specialization became amplified under Inka rule as the perquisites of elite status gained state sanction. As noted earlier, one consequence of the imposition of imperial rule in the Mantaro was the centralization of political authority in the Hatunxauxa *saya* under a single *hunu kuraka* (lord of 10,000 households). We thought it likely that this would have led to greater investment in production by attached specialists charged with making fine objects for the elite households.

The analytical chapters (6–11) in this volume show that UMARP's approach to specialization has been refined over the years, paralleling more general archaeological interest in the topic (e.g., D. Arnold, 1985; J. Arnold, 1987; Brumfiel and Earle, 1987; van der Leeuw, 1977; Clark and Parry, 1990). Costin (Chapter 9, this volume; 1986, 1991) provides the most explicit theoretical argument. She suggests that specialization entails four dimensions, each of which can vary through several states or along a continuum: context, concentration, scale, and intensity (cf. van der Leeuw, 1977; Brumfiel and Earle, 1987:5). Various combinations result in different kinds of specialization, among them individual, dispersed workshop, corvée, community, and retainer workshop. Present evidence suggests that the members of Xauxa households participated in several of these forms of productive labor, providing one key reason why we feel that to conceive of Andean household labor as a normative or unitary phenomenon is to misconstrue the situation.

UMARP's approach to investigating both generalized and specialized production followed standard procedures of identifying the materials, features, and social contexts of household production. Each chapter here describes the elements evaluated for each kind of industry; in brief, we attempted systematic recovery of raw materials, tools, by-products, and products of the manufacturing process. For ceramics, raw materials could include clay and temper; tools could include polishing stones and bone tools used to shape vessels; by-products could include wasters and ash dumps; and products included the ceramics themselves. Similarly, we recorded the archaeological features, such as hearths or dumps, that could be associated with production.

An essential part of the approach is comparative. Ceramic production, for instance, is inferred not simply from the presence of by-products but from both the concentration of by-products and the ratio of products to tools, raw materials, and by-products, along with features (Chapters 9 and 10, this volume). Casual and specialized stone tool manufacture are similarly inferred from the presence of debitage and associated tools, the ratio between them, the presence of raw materials, and objects from the various stages of production, such as preforms and blanks (Russell, 1988). Assessment of the social status of the households was also critical to the analysis given our assumption that different elements of society would be differentially involved in varied kinds of production. As described further in Chapter 4, we divided the populace into elite and commoner statuses for purposes of sampling, using architectural and locational features to make the determinations.

We recognize that this approach leaves aside important aspects of the organization and disposition of household labor, most notably, the provision of many kinds of services. Labor obligations to the state under Inka rule entailed many duties—including distant military service, portage, herding, and communications—that would have left few, if any, traces in the household. Even under the autonomous rule of Wanka II, personal services by the general populace to elites may have left little evidence in the households of those providing the services. In deriving broader interpretations of the domestic economy, these issues need to be confronted. Nonetheless, as can be seen in the following chapters, the diversity of evidence for household production is truly impressive.

Exchange

The final major area of UMARP's research concerned changes in exchange resulting from incorporation by the Inkas. We were interested in determining whether the amount and contexts of exchange changed from Wanka II to III, whether the elite had preferred access to exchanged goods in Wanka II and III, and whether the concentration of exotics in elite compounds increased from Wanka II to III. Documentary sources report extensive exchange among late prehistoric coastal sociopolitical units specialized in everything from farming and fishing to sandal making, potting, metallurgy, and long-distance trade in shell (e.g., Rostworowski de Diez Canseco, 1970, 1977, 1978, 1999; Netherly, 1978). Their sierra neighbors appear to have been far more autonomous, but low-level trade among groups with access to localized resources seems to have been present (e.g., Ortize Zúñiga, 1967, 1972). Of particular note are perishables, such as coca, wool, salt, and *ch'arki* (jerked meat), which leave few archaeological traces (although see Hastorf, 1987). Other objects made from localized source materials should have been preserved archaeologically, however, including those made from metal, shell, ceramics, and lithics.

Our assessment of exchange, as Earle describes in Chapter 12, was based on a combination of approaches. Most important have been sourcing analysis, examination of stylistic variations for intrusive materials, and comparison of the assemblage of biotic remains and the natural environments in the Upper Mantaro region. We anticipated the Wanka II settlements would be characterized by two features: favored access among the elites in the kinds of goods exchanged, and an emphasis on long-distance exchange of goods use to mark status. Overall, we thought it unlikely that there was much exchange in Wanka II in subsistence and basic craft goods, because of both the local self-sufficiency and the impediments imposed by warfare. For the same reasons that we expected an increase in specialized production in Wanka III, we anticipated to find expanded exchange among the Xauxa populace under Inka rule. We felt that the cessation of local hostilities would have freed interaction among formerly antagonistic neighbors, favoring exploitation of isolated resources for local exchange. Similarly, we expected that the assimilation of the native elites into the imperial administration would have provided them access to networks and goods unavailable during the era of autonomous rule. The goods were expected to be mostly associated with affirmation of status: state ceramics, metals, lapidary objects, and the like.

CONCLUSION

UMARP's research focused on an integrated set of questions concerning the daily life of an agrarian populace under autonomous and imperial dominion. The research concentrated on consumption, production, and exchange at the household level, during successive eras of volatile politics. In Wanka II, the last pre-Inka century, households functioned within a setting of intense local competition but modest sociopolitical differentiation. Under the Inkas, the situation changed to one of relative regional peace but marked political hierarchy. In most of the remainder of this volume, the authors examine how the domestic economy developed and then was transformed in conjunction with these broader social contexts.

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Chapter 3

The Natural Environment

Christine A. Hastorf

The diverse topography, sharp altitudinal gradients, alpine environment, and seasonal fluctuations of the highland intermontane region create a dynamic setting for dense, settled prehistoric human populations. As Troll (1968) points out, most of the environments on the earth can be found within this small geographic area, resulting in a potential for varied resource extraction, production, and interest in the area. With their relatively stable environment, these central valleys are surrounded by extremes, with the dry, harsh desert over the mountains to the west and the lush verdant Amazon off to the east. Being close to the equator, the climatic differences are far more influenced by altitude than latitude, making different ecological zones contiguous and often close to each other in the steeper areas. This provides diversity in production, with more than one zone being the norm for any family unit. This environment gives Andean agriculture and animal husbandry some specific constraints, however, especially fertility, temperature, and moisture constraints. There are very few ecozones that alone are capable of supporting a population over the long run (Golte, 1980). Therefore, multiple zone use is the most common form of interaction with the environment today, which surely was the case also in the past (Winterhalder and Thomas, 1978).

Within this diverse world, each Andean region is unique with its own proportions of resources and access, as well as its own cultural trajectory. The region in and around Jauja, one of the major intermontane river valleys within the Andes, also has its unique environmental and cultural characteristics. The Upper Mantaro Valley is one of those rare expanses of flat, fertile terrain in this land of precipitous slopes, providing the area not only with good, watered agricultural land but also fairly easy access to other zones and both sides of the cordillera. This region, therefore, was a prime area for highland settlement, populated and contested over for millennia. The archaeological record attests to periodic pan-Andean themes but with a distinctly local and eventually Xauxa or Wanka brand of social development. This location as well as the environment channel the region along its own dynamic. While the area does not exactly look the way it must have looked in the past, the study of its biotic, geomorphological, climatic, and anthropogenic changes places what we see today in relation to the era we are studying.

THE ENVIRONMENT

The Mantaro River Valley lies in the central highlands of Peru, surrounded by small valleys, dissected foothills, and subalpine plateaus that step up to the two towering Cordillera ranges of the Andean mountain chain. The Mantaro River, a major intermontane river, issues from the northwest side of Lake Junín (Chinchaycocha), flowing south across a high plateau, then through the Cordillera Occidental into a rugged gorge, where it enters the western side of the study region. Opening up near the modern town of Jauja, the river flows onto a large alluvial plain, 4–24 km wide, that extends 60 km southeast, passing by the modem city of Huancayo. From this large valley plain, the river heads southeast through the province of Huancavelica to Acobamba, where it turns east and drops toward the Amazon Basin, joining the Apurimac River. As in much of the Andes, the topography of the Jauja study region has been formed by a series of diverse sedimentary, glacial, and tectonic actions. The Mantaro Valley was formed by an uplift disconformity sometime between the Late Pliocene and Early Pleistocene (Harrison, 1956). Interestingly enough, the eastern and western sides of the Mantaro Valley have very different geological histories, topographies, and soils, the west primarily limestone and the east a mixture of igneous and sedimentary rock (Harrison, 1943; Servicio Cooperativo Inter-Americano de Producciónde Alimentos, 1956; Megard, 1968).

The study region (Figure 3.1), about 25 x 43 km (11°37'70"-1 1°53'30"S, 72°22'20"-75°37'20"W), is bordered by high puna plateaus on three sides and the flat and ever-widening Mantaro Valley to the south. It contains a series of small tributary valleys, the Masma, the Paca, and the Yanamarca, whose valley floors range in elevation from 3,380 to 3,550 m. These small valleys are the focus of our research and became the residence of the Xauxa (Sausa) people at least since the Early Intermediate Period (EIP). Because of the intervalley hills, small tributary valleys became neat, bounded social units.

These valleys are watered by small streams flowing from the surrounding slopes. The valley basins are filled with Quaternary sediments, deposited by retreating glacial outwash and erosion. The soils range from tine loamy silts to false bedded coarse gravels (Servicio Cooperativo Inter-Americano de Producción de Alimentos, 1956). Today these valleys contain small lakes each in various stages of desiccation as the valleys fill with hillside colluvial erosion. Only Laguna Paca can still be considered a year-round lake, though the southern half is covered with floating mats of rushes and sedges. Originally these valleys drained into the Mantaro River. All three lakes, however, have been cut off from the Mantaro drainage catchment by interglacial fill, and alluvial and eolian sedimentation.

To the west of the Yanamarca Valley and the western border of our study area, an upland limestone ridge that rises gradually to the puna has been sharply cut by the steep sided Río Quishualcancha (Figure 3.1). To its south, this upland was cut by the Río Mantaro as it flowed through a gorge. In the interglacial phases of the Quaternary period, the southeastern side of the Yanamarca valley was sealed off from the Mantaro River by unconsolidated glacial gravels, forcing Laguna Tragadero to drain subterraneously into a limestone sinkhole, which it still does.

To the east, a limestone ridge separates the Yanamarca Valley from the Paca Valley, which has been cut off from the main valley and is today filled with a lake approximately 5,000 years old at the most (Wright places its age between 2500 and 5300 B.P., in Hastorf

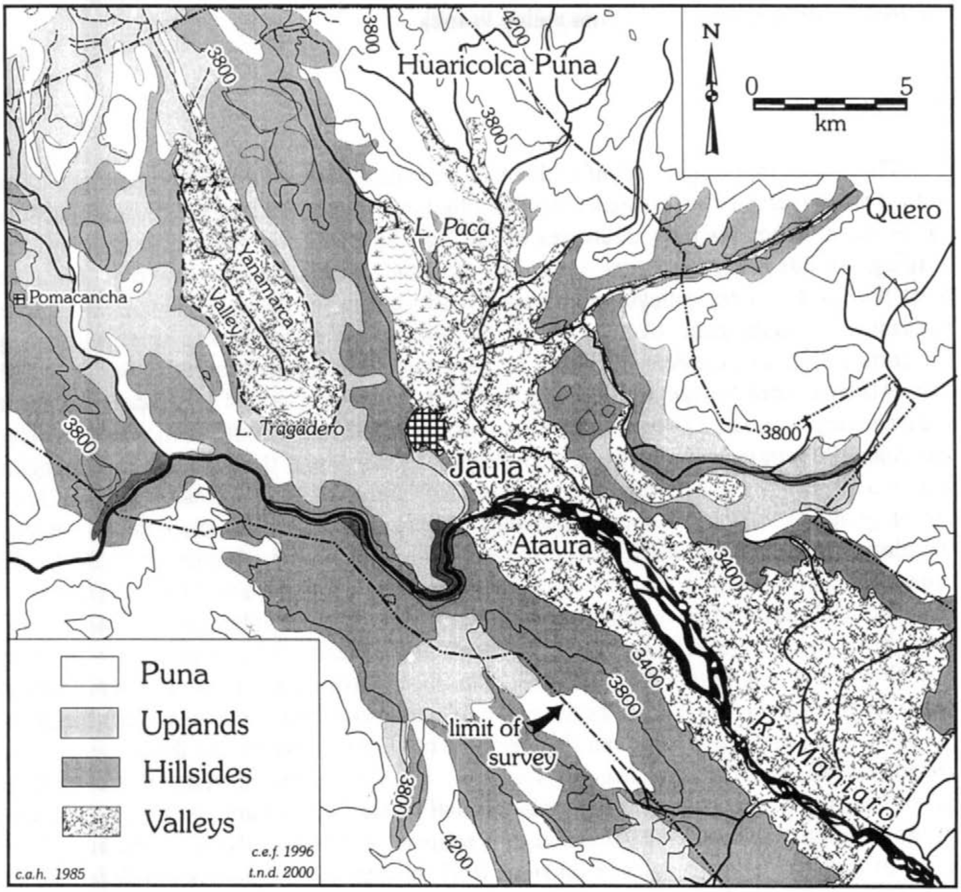

Figure 3.1. Upper Mantaro Research Project region showing major environmental zones.

et al., 1989:84). This very recent date alternatively suggests this lake might have originated from a solution depression in the limestone. Furthermore, Wright posits that today's lake level may have resulted from new deposition of erosion sediment, perhaps only centuries or decades old, suggesting a marked increase in hillside erosion since the Spanish conquest. Today there is a modern canal connecting the lake to the Mantaro River that regulates the lake's water level. The Masma Valley, southeast of Paca, also has an almost completely silted-in lake, draining north to join the Río Quero that empties into the Mantaro River from the east.

The Mantaro basin, compared to other sierran regions, has a relatively large expanse of flat and gently sloping arable land. It is known for its agricultural richness and its good harvests of maize, Andean tubers, European cereals, and garden vegetables (Toledo, 1940c; Salera *et al.,* 1954; Mayer, 1979; Hastorf, 1983). The Jauja end of the valley is the highest and narrowest. Therefore, our study region around Jauja cannot produce on the same scale as the southern Mantaro Valley. Probably not a new trait, this could have caused the cultural dynamic we still sense today, illustrated by the fact that the northern Xauxa consider themselves different from the main valley Wanka.

CLIMATE

The drastic topographic relief of the Andes creates localized climatic conditions. This in turn has a major effect on agricultural production. Our study region lies in the ecotone of the three major resource strategies in the Andes: maize farming, tuber fanning, and herding. In this intermontane area, the two climatic seasons are rainy and dry. From the west, the Pacific Ocean anticyclone pushes cool, dry air up into the western mountains; from the east, the Atlantic anticyclone carries moist, warm tropical air over the Amazon Basin up the eastern slopes of the Andes. These warm, moist air masses are forced upwards, which causes them to cool and condense. Because of this, the eastern side of the Andes, with mean annual precipitation of 2,800 mm, receives more rainfall than the west coast, which received less than 100 mm/year (Hoffman, 1975). Being intermontane, the Mantaro Valley region has on average the same precipitation (Seltzer and Hastorf, 1990). Rainstorms in the Jauja region generally move in from the northeast. In the austral summer (September–March), thunderstorms arrive in the afternoons and early evenings (Schwerdtfeger, 1976:193). The remaining part of the year is distinctly drier, with clear, warm days and freezing nights.

The Andean moisture regime varies tremendously. In the Mantaro region, consecutive drought years are rare, although critical rainfall at the onset of the rainy season can vary significantly. Precipitation from September through November is a major determinant of agricultural success, for only after the onset of steady continual rains can seeds be sown. A late onset of the steady rains can shift the time of crop maturation into the colder season. During the height of the rainy season (November–March), the recorded monthly average of rain in Jauja is 17 mm, which is adequate for nonirrigated agriculture. At the Jauja station of the Oficina Nacional de Evaluación de Recursos Naturales (ONERN), during fifteen years of recorded climatological data from 1958 through 1972, September rainfall varied between a critically low 11 mm and a soggy 52.5 mm, with an average of 28.7 mm; November had a minimum of 22.8 mm and a maximum of 141.3 mm, averaging 62 mm, which is sufficient to ensure the germination of the seedlings. Within the altitude of the study area (3,380–4,100 m) hailstorms, although localized, can occur at any time during the rainy season and cause slight to extensive crop damage, depending on when they arrive in the crop's life cycle.

Unlike moisture that varies with weather patterns and location, temperature varies with altitude (Drewes and Drewes, 1957, Wright, 1980; Seltzer, 1987). The mean average temperature between 3,000 and 4,500 m has been charted for the higher Andes from over twenty stations (Drewes and Drewes, 1957; Johnson, 1976; ONERN, 1976; U. S. Department of Commerce, 1966; Papadakis, 1961; Hastorf, 1993; Seltzer and Hastorf, 1990). Temperature against elevation indicates that mean annual temperature decreases approximately 5.0 degrees C with a 1,000 m increase in elevation up to 4,500 m. Also correlated with elevation is a decrease in minimum temperatures, accentuated during the dry season (May–October), when there is less cloud cover, allowing for loss of long-wave radiation at night.

Seasonal temperature variation is not pronounced. In fact, mean daily dry season temperatures can be nearly the same as those in the rainy season (Schwerdtfeger, 1976); it is the diurnal fluctuations that are seasonally extreme and most critical (Troll, 1968:19). In Huancayo, the average daily temperature variation is approximately 17°C in the dry season and 13°C in the rainy season. Because of this diurnal effect, minimum temperatures are the most informative indicators of agricultural limitations.

Despite the moderating effect of the rainy season's cloud cover, crop-damaging, frosty nights may occur on the northern Mantaro Valley floor at any time of the year. Rainy season frost tends to hit in localized patches as cold air funnels down the water drainages from the mountainsides and settles in the valleys. This localized frost is called *helada blanca* (Mayer, 1979:24). Frost damage decreases with elevation, making serious crop damage rare below 3,450 m. It is the settling property of cold air that leads farmers above 3,500 m to prefer cultivating on slopes rather than flat land. Mayer (1979:24) reports another type of frost, *helada negra,* which is much less frequent but potentially more damaging. It is caused by the upward movement of very cold, dry maritime air that can settle in large areas.

The lower limit of regular frosts roughly coincides with the upper edge of maize production, especially in the hills and protected areas. In a modern agricultural study, farmers in the small valleys of Paca, Masma, and Yanamarca all noted that they occasionally had to stay out all night burning shrubs to blanket their crops with warm smokey air when a *helada blanca* frost occurred on the valley floors (Hastorf, 1993).

In a xerophytic environment such as the Mantaro Valley, the rate of evapotranspiration is as important as precipitation for the success of crops. The evapotranspiration rate, determined from temperature, cloud cover, and humidity, is the amount of water lost out of the ground into the atmosphere as a result of solar radiation. If the evapotranspiration rate is low, meaning not much moisture is lost, a low-rainfall area can be as arable as a higher-rainfall area with a higher rate of evapotranspiration (Kirkby, 1973). A rainfall/evapotranspiration value (WET) of 1.0 or greater indicates that there is sufficient moisture in the soil for crop survival. From the monthly Jauja WET values averaged over fourteen years, December, January, February, and March have a value safely greater than 1 .0, with enough moisture for maturing crops. The critical months—October, November, and April—are at the beginning and end of the growing seasons. During the fifteen years of recorded data in October and November, and April, seven years had WET values of less than 1.0, indicating drought conditions during critical germination months. In this situation, the farmers can either irrigate at the onset of the agricultural cycle until the rains begin regularly, or they can sow later, making their crops vulnerable to the frosts that are more frequent at the end of the rainy season in May and June. These data suggest that farmers must take extra precautions or provide extra labor to ensure decent harvests about 50% of the time.

The paleoclimatic work conducted in the central Andes includes the mapping, coring, and dating of glacial advances, retreats, and maximal extensions (Hansen, Wright, and Bradbury, 1984; Wright, 1980; 1984; Seltzer, 1987; Hansen, Seltzer, and Wright, 1994; Seltzer and Hastorf, 1990). Wright's (1980) first study was of the glacial movements to the west of the Lake Junín basin. Subsequently, in 1985 and 1986, Wright and Seltzer worked in the eastern Cordillera at the southern edge of the Mantaro Valley at the Nevado Huaytapallana. At both places they have tracked the glacial movements by dating the basal soils of terminal moraines and lake sediments that will reflect the onset of glacial retreats.

Each advance was less extensive than the previous one. The earliest Late Pleistocene glaciation ended by ca. 10,000 B.C. (radiocarbon assay SI-1490, SI-1489; Wright, 1980), creating an environment 2.1°C cooler than today's average for Jauja.

During the Late Holocene, the ice advanced at least two more times, 100–300 m below its modern limits. The first advance is recorded in a core that dates to 1290 B.P., at approximately A.D. 650 (radiocarbon assay SI-6995A; Seltzer and Hastorf, 1990, Table 1). This indicates that glaciers retreated sometime before this date. During this time, the temperature in the Jauja region would have been approximately 0.6°C cooler than today's average. After this advance, there was a period of interglacial warming, with temperatures much like today until the latest glacial advance, at approximately A.D. 1,290 (650 B.P., radiocarbon assay WIS-1970, Wright, 1988; Seltzer, 1987; Seltzer and Hastorf, 1990, Table 1). During the next advance, roughly between A.D. 1200 and 1500, the average temperature was 0.6°C cooler than today's average. This 0.6°C average downward shift in temperature is comparable to an altitude shift of 70 m. In other words, starting around A.D. 1,300, the central Andean climate and vegetation around the Mantaro Valley would have been 70 m lower that what we see now (Seltzer and Hastorf, 1990). The climate probably did not warm up to what we experience today until just before the Spanish conquest. Since this last Holocene glaciation, the glaciers at Nevado Huaytapallana have been receding. From Seltzer's (1987) work on the local climatic reconstruction, he concludes that these cooler times were also slightly drier.

The time span ofthis archaeological project is from approximately A.D. 1,200 to 1,533. This means that the region was slightly cooler and drier than today, with production zones shifted downslope some 70 m. During the Wanka II phase then, the frost-free hillsides and protected areas would have been less extensive than at present, and the upper limits of agricultural production would have been lower.

BIOTIC ZONES

Throughout the twentieth century, a series of geographers and biologists have defined and described various microzones in the Andean region, including Weberbauer (1945), Holdridge (1967), Drewes and Drewes (1957), Troll (1968), Tosi (1960), and Pulgar Vidal (1967). While these projects had their own goals, I would like to synthesize their biotic definitions in with my own observations of the Upper Mantaro area and outline eight ecozones that have cultural meaning to Andean inhabitants, based on a regional study of resources and land use (Hastorf, 1983). While these are modern land-use zones, in conjunction with the paleoclimatic reconstruction, they provide an environmental context for the archaeological trends seen in the following chapters.

The northern portion of the Mantaro Valley (3,150–3,400 m) consists of flat alluvial benches along the river and alluvial fans where the tributary streams enter the valley basins above the river bottoms. This zone can be classified in Tosi's terms (1960:11) as dry, lower montane savanna forest *(sebana o bosque seco montano bajo),* and by Pulgar Vidal (1967:73) as the *quechua* zone. The subxerophytic vegetation in the Mantaro Valley zone is described by Weberbauer (1945:421) as grassy steppe with scattered shrubs. The density of these "shrubs" varies with agricultural intensity and tree cropping. Patches of shrubs are now found scattered around irrigation canals and in side valleys; they are most frequently composed of *Schinus molle, Caesalpinia spinosa, C. tinctoria, Rhamnus pubescens, Tillandsia tictoreum, Anona cherimola, Acacia macracantha, Prosopis cassia,* and *Mentzelia* sp. Alder *(Alnus jorullensis)* is found along the moister riparian areas (Weberbauer, 1945; Tosi, 1960). Field wind breaks are now mainly composed ofeucalyptus *(Eucalyptus globulus),* introduced a century ago, replacing indigenous shrub and tree cropping. Animals from other zones have been brought in, especially the dog *(Canis familiaris),* but locally there are also the fox *(Dusicyon culpacus andenus)* and the jauguarundi cat *(Felis yagouaroundi),* the deer *(Odocoileus virginianus,* or *Teruga* spp.), and an array of rodents, including the marsh rat *(Neotomys ebriosus)* (Sandefur, 1988a).

Dry farming (water provided by rainfall only) is common; irrigation is done primarily around planting times. In the southern reaches ofthe valley, somewhat warmer temperatures and higher evapotranspiration rates make irrigation more important. Intensive farming now produces a wide range of crops, including the frost-intolerant crops maize *(Zea mays),* beans *(Phaseolus vulgaris),* and various garden vegetables. European cultigens such as wheat *(Triticum* spp.) have been successfully incorporated with the Andean crops of potato *(Solanum andigeum* or *tuberosum,* etc.) and quinoa *(Chenopodium quinoa).*

The small tributary valleys that surround the Mantaro Valley are somewhat higher, ranging in altitude from 3,200 m near Huancayo to 3,500 m in the northwestern Yanamarca Valley and near Yauli in the northeast. The climate is therefore slightly moister and cooler. The valley soils range from coarse, well-drained gravels to very fine, poorly drained silts. The poorly drained valley soils surround the desiccating lakes. There is evidence of pre-Hispanic excavated drained fields in every moist flat area in the study region (Hastorf and Earle, 1985). Nearby gorges *(quebradas)* that extend up through the hillsides offer protection against frost and are the source for wood needed for tools and house construction.

The surrounding hill slopes (3,370–3,850 m) consist of shallow, rocky podzols created by weathering ofthe limestone in the west and the igneous and metamorphic bedrock to the east (Brady, 1974:342). The terrain is sloped and deeply dissected, with erosion constantly thinning the soil. Periodic springs are found at the break in slope near the valley floors, allowing for both local irrigation and domestic water. This makes the valley edge adesirable place to live. In this zone are found good sources of clay for ceramic production, making the unvegetated areas valuable in other domains ofthe society. This zone is subsumed under Tosi's (1960:19) humid mountain prairie–forest *(pradero o bosque húmedo montano)* category. As is typical of the tropical zone to the east of the study region in protected *quebradas,* on the slopes above the valley floors the shrubby forest extends upward almost into contact with the *puna,* and the rocky, exposed ridges are covered only with prairie grasses (Troll, 1968:29). These slopes lie within Pulgar Vidal's (1967:89) *suni* zone of extensive tuberous agriculture. Sparse shrubs and trees are found in the rocky grasslands, including the cold-adapted trees *Polylepis racemosa (quinhual), Buddleia* spp. *(quishwar),* and *Barnadesia* sp. (Tosi, 1960:117; Bird, 1970:94). Occurring in both the protected quebradas and the open grasslands are the smaller shrubs and succulents *Agave americana, Berberis, Senecio, Ribes, Monnina, Lupinus,* and *Solanum* (Weberbauer, 1945:426; Tosi, 1960). Traditional agricultural practices concentrate on extensive farming of Andean tubers, potato as well as oca *(Oxalis tuberosa),* olluco *(Ullucus tuberosus),* and mashua *(Tropaeolum tuberosum),* quinoa, the indigenous lupine, talhui *(Lupinus mutabilis),* and the hardier European crops such as wheat, fava beans, barley *(Hordeum* sp.) and oats *(Avena* sp.). Here, too, we see remnants of old agricultural terraces, both long, stone-lined terraces and short, more irregular step *andenes rústicos* (Hastorf and Earle, 1985).

Above the hill slopes to the north and west of the valleys are the rolling uplands (3,600–3,900 m). These uplands are still within Tosi's humid montane–forest *(bosque húmedo montano)* and Pulgar Vidal's *suni* zone. The major differences between this zone and the hill slopes are that many of the wild plants are different and the soil is deep and fertile. Because of the area's fertility, it is farmed extensively today, with the indigenous and feral vegetation virtually relegated to the borders of fields, roads, around villages, and in fallow fields. The most common grasses and herbs are *Stipa ichu, Festuca horridula, Bromus unioloides, Paronychia rigida, Lepidium abrotanifolium, Trifolium peruvianum, Lupinus fieldii, Oenothera multicaulis, Oxalis ptychoclada, Plantago linearis, Valeriana thalictroides, Verbena villifolia, Solanum* sp., and the succulents *Opuntia* and *Echinocactus* (Weberbauer, 1945:42 1). Many of these genera are seen in the pre-Hispanic archaeological record (Hastorf, 1983). Domestic animals graze on the fringes and also in the fallow fields. In addition there are several wild animals of these upper zones, including the mountain viscacha *(Lagidium peruanum* var.), the skunk *(Mustela* spp.), the small wildcat *(Felis concolor),* and the taruga deer *(Hippocamelus antisensis)* (Sandefur, 1988a).

Although many geographers (e.g., Tosi) refer to this type of zone as forested or covered with dispersed shrubs, the shrubs have been depleted by firewood collection and land clearing and are now found only in narrow *quebradas* (Johannessen and Hastorf, 1990). These protected areas also harbor the wild animals of the zone, which is quite exposed to the elements; frost can be a recurrent problem on the more gentle slopes and particularly in the swales. The focus of rolling upland agriculture is on tuberous crops.

At its upper edge, the high upland zone (3,800–4,100 m) intersects with an unarable puna grassland zone. The soil is generally much more shallow than in the lower rolling upland elevations. Landslides, which wipe out agricultural areas altogether, are common on the steeper slopes. This zone, the low *puna* of Pulgar Vidal (1967), is equivalent to Tosi's (1960) wet subalpine *puna (páramo muy húmedo subalpino).* Bunch grasses dominate the terrain with genera such as *Festuca, Bromus, Calamagrostis, Agrostis, Poa,* and *Stipa ichu* (Tosi, 1960:133). Even in the protected valleys, shrub growth is rarely found. This, of course, is the home of the South American camelids. The two wild species living still in the high, rugged, and often arid terrain are the vicuña *(Vicugna vicugna)* and the guanaco *(Lama guanicoe).* Much study has gone into these wild camelids and their domesticated relatives the llama (Lama glama) and the alpaca *(Lama pacos).* Both are considered to have evolved out of the guanaco, and it is further thought that they might have been a wild species variety before they were domesticated some 6,000 years ago (Webb, 1965; Sandefur, 1988a). When describing the lower portions of the Huaricolca *puna,* Tosi mentions that it is more humid than most Andean puna lands. This particular characteristic is why we also have the Junín frog *(Batrachophrynus)* in the Huaricolca *puna,* on the northern border of the study area.

Despite its bleak appearance, this *puna* zone is highly valuable because of its forage capacity; the moister the land, the better the forage, especially for camelids such as alpaca. The more frost-resistant tubers—the bitter potatoes *(Solanum juzepezukii* Buk and *S. curtilobum* Juz et Buk) (Carney, 1980:3), *mashua,* and *olluco*— and the root crop *maca (Lepidium meyenii)* (Leon, 1964) are the indigenous crops produced in this area. Forage crops, barley and oats, are harvested or eaten in the fields by herded animals. Because of the long fallow cycle of these fields (one year in seven to ten in production), animals graze and fertilize the fallowed fields, sustaining both aspects of the Andean domestic economy.

The puna zone is above agricultural limits (4,000–4,100 m in protected areas) and can extend up to 4,650 m, where it borders on the frigid cordillera, a climate suitable only to lichens and microorganisms. The *puna* is found in the hills surrounding the study region to the east, west, and also to the north, where it extends continuously up to the Lake Junín area. The most common vegetation found are grasses, mosses, ferns, and polster-, rosette-, and stem-forming herbs (Pearsall, 1980:191–193). This is the zone where animals are permanently herded today, both camelids and sheep (see Sandefur, Chapter 8, this volume).

Above the *puna* is the rocky glacial cordillera, home of the many Andean *apus,* or deities. In addition, this is the source of many mineral deposits for which the Spanish conquest is so famous. As Owen discusses in Chapter 11, copper and silver seem to have been extracted in the Jauja region pre-Hispanically, with increasing extraction during colonial times.

The final ecological zone involved in the Jauja pre-Hispanic inhabitants' resources is the *ceja de montaña* (1,200–2,000 m), located up and over the Cordillera Blanca to the east of the Mantaro Basin. This is called *rupa* by Pulgar Vidal (1967). From the crest of the eastern snow-peaked mountains, rivers plunge steeply toward the Amazon Basin. The moist, warm air moving upslope over this landscape creates a climate that maintains a dense tropical forest on the slopes. Genera of the families Bromeliaceae (bromeliads), Arecaceae (palms), Musaceae (bananas), Ericaceae, Orchidaceae, and Lauraceae, as well as bryophytes, are prevalent in this forest.

Many more species are present here than in the upper zones west of the Cordillera (for a fuller list of the plants found in the *ceja de montaña,* see Weberbauer, 1945:52). This includes not only the important spices such as chili peppers *(Capsicum* spp.) and the coca trees *(Erythroxylum coca)* but also a range of fruits. Of course, many animals live in this zone and some of them have entered Andean archaeological records. Among these are the opossum *(Dipelphis* spp.), the monkey *(Lagotherim* sp.), the bear *(Tremarctos),* and the jaguar *(Leo oncaperuvianus).* The soil is shallow, highly leached, and held in place on the hills by the dense plant cover.

SUMMARY

Resource use of such a diverse environment is tied to the ecozones accessible to a population, their elevation, moisture regimes, population size, technological traditions, and social organization of the workforce. One of the most important characteristics of Andean adaptation has been the complementary use of multizonal resources by individual groups. This was brought to researchers' attention in the verticality model of Murra (1972). The localized multizone, multistrategy adaptation is ecologically effective in maintaining yields in diverse environments, especially when the zones are contiguous (Yamamoto, 1985). Golte (1980) has argued that multizone use developed because the productivity of any one zone is low and too restricted, and that several production zones are necessary to gain a sufficient dietary mix. Crop yields and grazing intensity vary with elevation. For example, Gade (1975) shows effective crop yields graphically in his maps of the Vilcanota Valley. Maize produces better at a lower elevation than *quinoa.* Potatoes, *talhui, oca,* and *ulluco* overlap productive yields across the next elevation gradient, and finally mashua and *maca* can mature in the highest arable elevations. Animals tend to be herded more at the increased elevations, where there are fewer crops grown, more fallow years, and more food for camelids. But wild animals were also important, since there were many more wild animals worth hunting in the past, especially the two types of deer and the wildcat (puma). Because these animals were used in many ways, such as for musical instruments, tools, wool, and ceremonies, both the plants and the animals were involved in much more than dietary intake of the human population.

Of importance to archaeological settlement location studies, Mayer (1985:65–66) points out that the number of zones used intensively depends on several factors: the distance to these different zones from the community including the gradient and ease of movement; the location of the village and its position within the zones; the population size; and the social organization, allowing for access to the zones. He further points out that villages are located closer to production zones that receive the most intensive care, either because of ease of access or because people try to live near zones they want to use more intensively. These geographic constraints support the energetic argument of minimizing labor and time input to satisfy output. While land-use scholars note that many microzones will be used by any one Andean village, we also assume that the zones surrounding settlements will probably be used quite intensively.

In summary, this chapter has provided the basic environmental data both past and present that will be applied in the following chapters in the discussion of pre-Hispanic domestic economy in the Upper Mantaro Valley. More details on agriculture are found in Chapter 7 and in Chapter 8 on animal husbandry.

Chapter 4

The Archaeological Context

Terence N. D'Altroy

This chapter describes the archaeological context and field methods for UMARP's research into the Xauxa domestic economy. It begins with the site typology used to classify the region's archaeological remains and the rationale for sampling at the levels of region, site, and residential compound. The following section discusses the surface architecture at Hatunmarca and Tunanmarca to explain the distinction made between *elite* and *commoner* residential statuses. Finally, it reflects on the relationship between archaeological units of analysis and historically described social units to provide perspective on the appropriateness of UMARP's field program.

THE UMARP SITE TYPOLOGY

The demographic and architectural information from the Junín Project and UMARP research were used to develop the following settlement typology (Earle *et al.,* 1987:7; D'Altroy, 1992:44–46):

Hamlet: a residential settlement with a population of no more than 100 people, often with dispersed residential architecture. No public or ceremonial architecture was present.

Small village: a residential settlement with an estimated population of 100–500 people. No public or ceremonial architecture was present.

Large village: a residential settlement with an estimated population of 500–2,000 people. Public or ceremonial architecture was generally not present.

Town: a residential settlement with an estimated population of 2,000–7,500 people. Public or civic-ceremonial architecture and clearly defined public space were not present in Wanka II (hereafter WII) but were present in Wanka III (hereafter WIII). Towns were often differentiated into areas of high- and low-quality residential architecture.

Center: a residential settlement with a minimum population of about 7,500 people, with civic-ceremonial architecture and public space differentiated from the residential areas. Centers were found only in WII; their political functions within subject society were taken over by towns in WIII.

Additional types classify sites that are not remains of indigenous residential communities. The most important of these for the present volume are the Inka sites.

Small Inka (state) site: a settlement of fewer than 500 people, often with fewer than 100, generally located along the Inka road system. Civic-ceremonial architecture was either not present or of minor significance. Examples include an administrative facility (J63), road stations (J6, J45), and settlements with a probable religious emphasis (J4, J55).

Inka provincial center: a settlement capable of housing several thousand people permanently and billeting tens of thousands more temporarily. Only one such site was found in the study region: Hatun Xauxa (J5). It was characterized by Inka imperial architecture and a large plaza.

Inka storage facility: a site comprising single or multiple rows of standardized buildings of either circular or rectangular floor plan, or both; little or no resident population. There are thiry state storage facilities within the study region.

Agricultural site: drained fields, irrigation systems, and other features associated with specialized agricultural practices.

Special-purpose site: a site characterized by the absence of residential, storage, or administrative remains. Among such sites are road, bridge, and quarry sites.

THE ARCHAEOLOGICAL SAMPLE

A central goal of the research was to obtain a sample of residential compounds, termed *patio groups,* occupied by a reasonable cross-section of the people living in the Xauxa communities during WII and III. The comparative nature of the study called for samples as comparable as possible from both periods, but the condition of the remains constrained the kinds of strategies that could be effectively employed. Differences in preservation, access, and deposition meant that the deposits themselves were not precisely comparable. Most WII sites—and, significantly, all of the large ones—are situated on high-elevation knolls or ridge lines. Because they are relatively inaccessible and their thin soils are not conducive to farming, the sites have suffered little destruction by human hands. Most WIII sites are found at lower elevations and have deeper soils, with the result that they have been heavily farmed and their surface architecture badly disturbed. We were nonetheless fortunate that key sites were in good enough condition that we could largely attain our sampling goals. The research problem required sampling at two basic levels: sites, and residential compounds within sites. Because the details of the procedures have already been presented elsewhere (Earle *et al.,* 1987), we only summarize the procedures here.

Site Selection

Like any regional project, UMARP could examine only a subset of the archaeological remains from the two periods of interest. Altogether, surface surveys have recorded 38 settlements with WII components within the research area and 99 sites with Late Horizon/WIII residential components (Table 4.1). Of the latter, 69 have secure WIII

Table 4.1. Wanka II, Wanka III, and Inka Summary Site Size and Population Estimates

Sites	No. of sites	Pop. of smallest site (max)	Pop. of largest site (max)	Mean site pop. (max)	Median site pop. (max)	Regional pop. (max)
Wanka II	38	75	13,259	1,602	615	60,862
Wanka III	69	9	4,140	530	240	36,589
Inka	6	105	6,990	1,419	192	8,514
Other Wanka III (uncertain occupation)	24	—	—	—	—	—

residential components and 6 are imperial facilities, most importantly, Hatun Xauxa. Even with LeBlanc's (1981) refined chronology, the extent ofthe WIII component on 24 sites was ambiguous, perhaps because the occupations were sparse or only ephemeral. For WIII, the present analysis treats only the 69 sites with secure residential occupations. An additional series of sites is not included in this list: 30 state storage facilities; numerous agricultural terraces, canals, roads, and bridges; and 3 herding sites (J66,J69, J70) on the *puna* above the Yanamarca Valley.

Our goals required selection of sites for excavation on the basis of specific criteria and therefore did not employ random selection procedures at this level of analysis. We wanted to choose from (1) settlements from the WII and III periods, (2) different levels in the Xauxa settlement hierarchies, and (3) sites containing architecture that was well-enough preserved to permit the use of residential compounds as sampling units. For both periods, we felt it essential to study the largest sites in the region and at least one smaller settlement to obtain a cross-section of residential occupation. For WII, we selected the two largest sites, Tunanmarca (Figure 4.1) and Hatunmarca (Figure 4.2), both of which were classified as *centers* in the settlement typology (Table 4.2). For WIII, we also chose the two largest sites, Marca and a much reduced Hatunmarca, both classed as *towns* (Table 4.3). The WII subsidiary site was the town of Umpamalca (Figure 6.9), selected because its location and ceramic composition placed it in the socioeconomic orbit of Tunanmarca and it was relatively accessible. For WIII, we worked at the *large villages* of Huancas de la Cruz and Chucchus (Figure 4.3); their positions in the settlement hierarchy of the time were comparable to that of Umpamalca. These sites were the only moderately well-preserved WIII settlements found in the southern Yanamarca Valley. Their central positioning among Hatunmarca, Marca, and the Inka center of Hatun Xauxa suggested that changes in household activities might be more readily visible here than at other contemporaneous settlements. The architecture and planning of each site is examined in detail in Chapter 7, but we briefly describe them here to provide insight into the sampling strategy (see also Earle *et al.,* 1987).

Tunanmarca (J7)

A large center situated on a high ridge (3,850–3,900 m) in the northern Yanamarca Valley (Figure 4.1), Tunanmarca was occupied only during WII. The site's fortifications and location, about 200 m above the surrounding terrain, suggest that defense was a primary consideration in its positioning. The site is encircled by two defensive walls built from limestone rocks hewn from the hill. In area, it is the second-largest non-lnka site in the region, with a residential area covering 25.4 ha. Its unusually high residential density (about 174 structured/ha) contributed to making Tunanmarca the most populous settlement in the region, housing an estimated 7,955 (60% occupation) to 13,259 individuals (100%). The site is divided into two large sectors, separated by a wide, walled pathway. Between the two sectors lies a modest district of open plazas and large buildings that may have served as a focus of public or ceremonial activities. Architectural preservation at Tunanmarca is excellent, facilitating sampling procedures. Most of the site consists of compounds that contain an average of two circular structures each and a range of one to six structures (see below). These buildings typically face onto open patio areas enclosed by walls. As DeMarrais describes (Chapter 6), the amorphous layout ofthe architecture and the circuitous paths that crisscross the residential zones suggest that the site grew by accretion and was unplanned except at the most general level.

Hatunmarca (J2)

Located about 5 km to the south of Tunanmarca on a long ridge line (peaks at 3,670 and 3,812 m) along the west side of the valley (Figure 4.2), Hatunmarca was occupied from Wanka 1 through Wanka IV. Like Tunanmarca, it lies more than 100 m above the adjacent landscape and is protected by two defensive walls in most places; it also exhibits a dry moat on its gentler, western face. With an occupational area of 73.7 ha, Hatunmarca was the largest site of any kind within the region. Because its residential density (50 structures/ha) was less than one-third that of Tunanmarca, however, we estimate its WII population to have been lower than its neighbor, between 6,633 and 11,055. Demographically, WII Hatunmarca was therefore the second-largest community in the region. In WIII, the site was reduced markedly to about 27.4 ha, with an estimated 2,466–4,110 occupants. The two central knolls at Hatunmarca contain complexes of elite architecture, both residential and ceremonial. Much of the WIll architecture in the elite areas contains features imitative of imperial Inka design, such as rectangular floor plans and interior wall niches. Architectural preservation at Hatunmarca is much poorer than at the higher-elevation WII sites. Farmers have worked intensively on most of the site, creating huge piles of limestone rocks, much of which probably came from destroyed architecture. Because the central locations at Hatunmarca that might have contained public buildings were rebuilt in WIII, we have not been able to assess the nature of public–elite construction for WII. Even so, the site resembled Tunanmarca in important ways: division of the site into two large residential sectors, each enclosed by a large wall, and a relatively amorphous organization of compounds and paths within the residential sectors.

Figure 4.1. The Wanka II center of Tunanmarca.

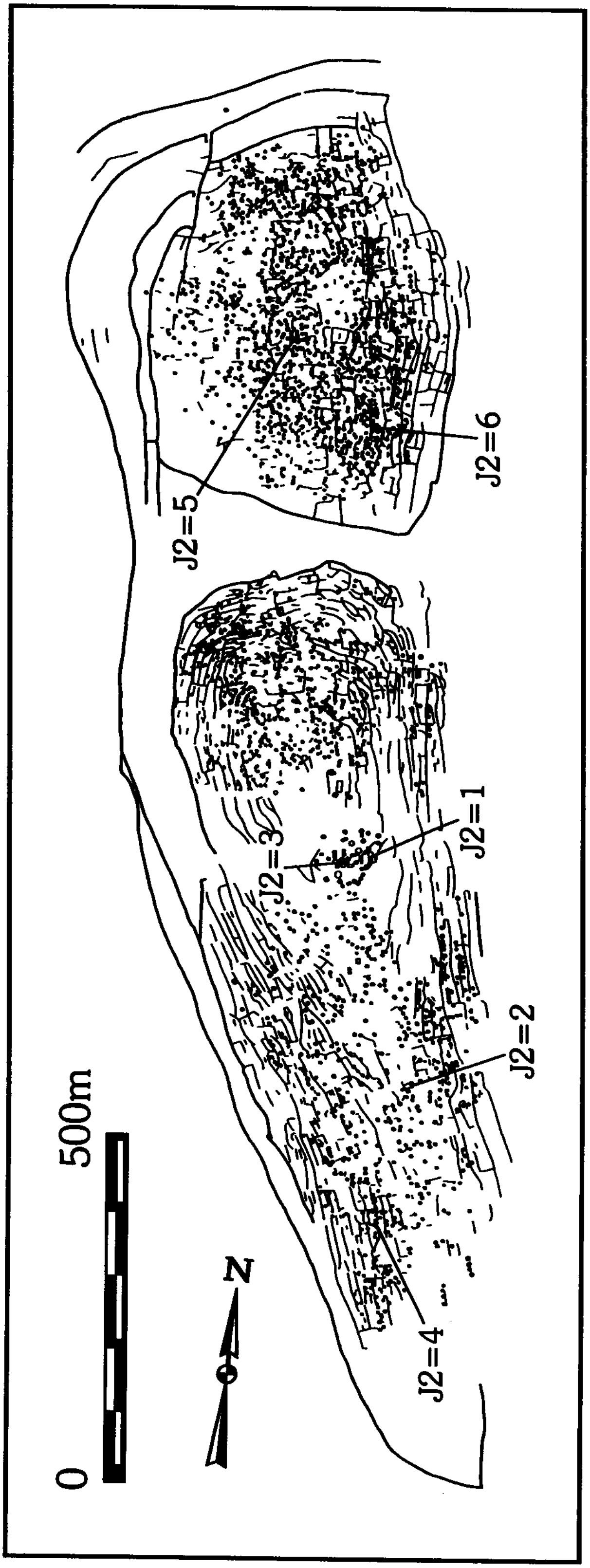

Figure 4.2. The Wanka I–IV Settlement of Hatunmarca.

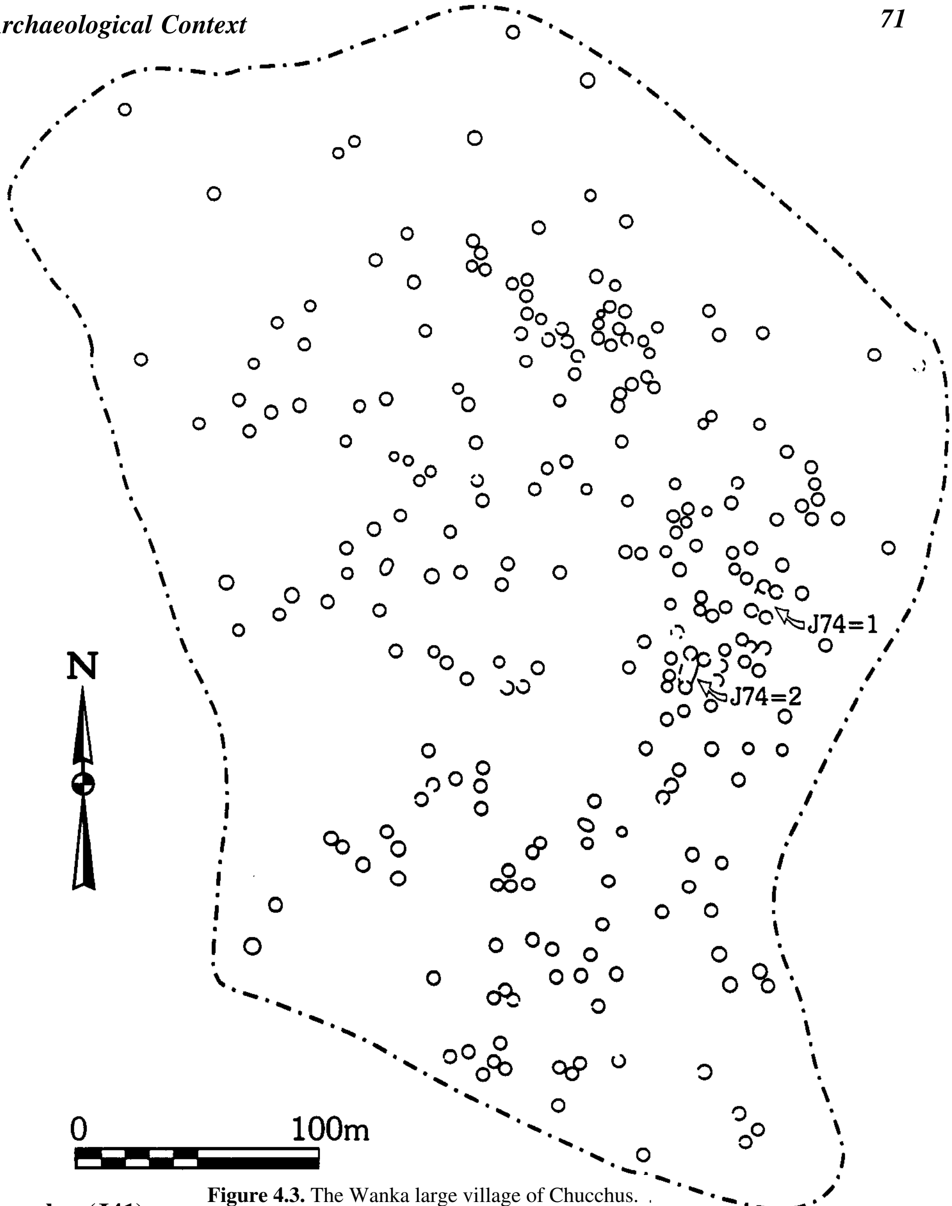

Figure 4.3. The Wanka large village of Chucchus.

Umpamalca (J41)

A WII town located at an elevation of 3,800 m at the western edge of the Yanamarca Valley, overlooking the Río Quishuarcancha (Figure 6.9a,b), Umpamalca is also surrounded by fortification walls and protected on its back side by a precipitous slope that falls over 300 m. The residential area covers 14.8 ha and the settlement housed about 3,889–6,482 individuals. Umpamalca lacks two features essential to the plans of Tunanmarca and Hatunmarca: the division into two sectors and centrally located public or ceremonial constructions. The architecture at the site appears to consist entirely ofresidential buildings organized into patio groups, joined and separated by serpentine pathways. As in the other settlements, gradations in the size and quality of the residences suggest variations in social status among its inhabitants.

Marca (J54)

A new town in the WIII period, founded under Inka rule in a location that had been occupied in WI but not WII (Figures 2.4–2.6), Marca is situated on a W-shaped rise (3,600 m) overlooking both the main Mantaro and Yanamarca valleys, about 5 km north of the Inka center of Hatun Xauxa, and directly above the imperial highway. The residential area of the site covers about 27.6 ha. We estimate that it housed 2,484–4,140 people, marginally more than coeval Hatunmarca. The surface remains at Marca are not as well preserved as any of the preceding sites, but we were still able to record 460 densely packed structures in the parts of the site that are in good condition. Like Hatunmarca, Marca probably contained both residential and public architecture, but only the residential buildings are preserved on the ground surface.

Huancas de la Cruz (J59)

A WIII large village that lies on a segment of the low ridge (3,550 m) separating the Yanamarca and main Mantaro valleys, Huancas de la Cruz has a residential area covering 11.2 ha and settlement housing an estimated 1,008–1,680 people. Surface preservation at this site is poor but several score circular house foundations remain visible. The site is notable for its proximity to the main state storage facilities about Hatun Xauxa, the closest of which lies only a few meters from the residential area.

Chucchus (J74)

Another WIII large village on the same low ridgeline (3,650 m) about 3 km south-southwest of Huancas de la Cruz and 4 km west of Hatun Xauxa (Figure 4.3). Chucchus has a habitation area covering 13.2 ha and housing about 1,056–1,760 residents. This site also lies near the main storage facilities above Hatun Xauxa but is clearly beyond the limits of the storage area. As often happened in the region, the new WIII settlement was built over an earlier Wanka I occupation. The presence of the two components in the stratigraphic record presented some difficulties in dating the excavated residential compounds.

SELECTION OF LOCATIONS FOR EXCAVATION

Stratification and Sampling

The goals of sampling within sites were to obtain a representative cross-section of the residential occupation at each settlement and to excavate compounds with intact architectural and materials deposits. The difficulties of meeting these joint goals required that we combine random and purposive elements in the sampling design. Because of differences in the quality of preservation, strategies varied in detail among settlements. Here, we outline our approach and refer readers to Earle *et al.* (1987:17–78) for the particulars of sampling at each site.

A first step was to stratify the sample of structures within settlements on the basis of architectural variation or obvious site divisions, such as the two sectors in Tunanmarca and Hatunmarca. Where no natural sectors were visible, arbitrary sectors of approximately the same area (e.g., 15 ha in Hatunmarca) were laid out. To ensure the recovery of a range of materials, we deliberately sampled from the central strata at the major sites and randomly selected other strata for sampling as time and resources permitted.

The second step entailed dividing the compounds into two general categories termed *elite* and *commoner* (Figures 4.4, 4.5). Three prior seasons of work showed that the compounds differed somewhat in their architecture but certain features seemed to co-vary well (DeMarrais, Chapter 6). Four criteria were used to classify compounds into the two categories: area, construction quality, number of structures, and proximity to public space. Elite compounds were recognizable in the larger settlements because they often lay in central areas at the highest point of the site, were associated with open plazas and nonresidential architecture, or both. The masonry used in their construction was generally superior to that of commoner compounds in both phases. During WIII, elite compounds sometimes incorporated features imitative of Inka architecture, such as rectangular floor plans (Figure 4.6). Elite compounds tended to have more structures, larger open patio spaces, and occupied more total area. Compounds that had one or two structures were classed as commoner; those with three could be classed in either group, and those with more were usually classed as elite.

When we undertook this stratification, we recognized that we might have been breaking continuous or perhaps multimodal distributions into categorical classes. There were such marked and consistent differences among the few really elaborate compounds and most patio groups, however, that we felt justified in making the distinction for purposes of sampling. Later in this chapter, we examine the relationship between the sampled compounds and broader samples of surface architecture to assess the degree to which this assumption was justified.

Our sampling goals included obtaining materials from both elite and commoner residential compounds from each site and time period, if present. For commoner patio groups, we numbered individual structures in each residential zone (sampling stratum) and then chose numbers from a random numbers table. Each structure was visited in the randomly selected order and the first compound to meet the criterion of overall preservation was chosen for excavation. Because the elite patio groups were much rarer, random procedures were not an effective means of locating well-preserved compounds. Elite compounds were therefore chosen purposively within the sampling sectors but distributed across the sites. Altogether, 29 patio groups were excavated either fully or in part (about 25%) during the 1982–1983 field seasons (Earle *et al.,* 1987:12-13). Some authors (e.g., Sandefur, Chapter 8) also use the data from two additional compounds that were excavated in previous seasons.

The sampling design within compounds also combined random and purposive approaches to ensure that we obtained materials from circular structures, rectangular structures, and open areas, if present. The best-preserved structures of each type were selected for excavation; if several were intact, a choice was made randomly. If only part of a structure was excavated, that area was chosen randomly. The excavation of five complete

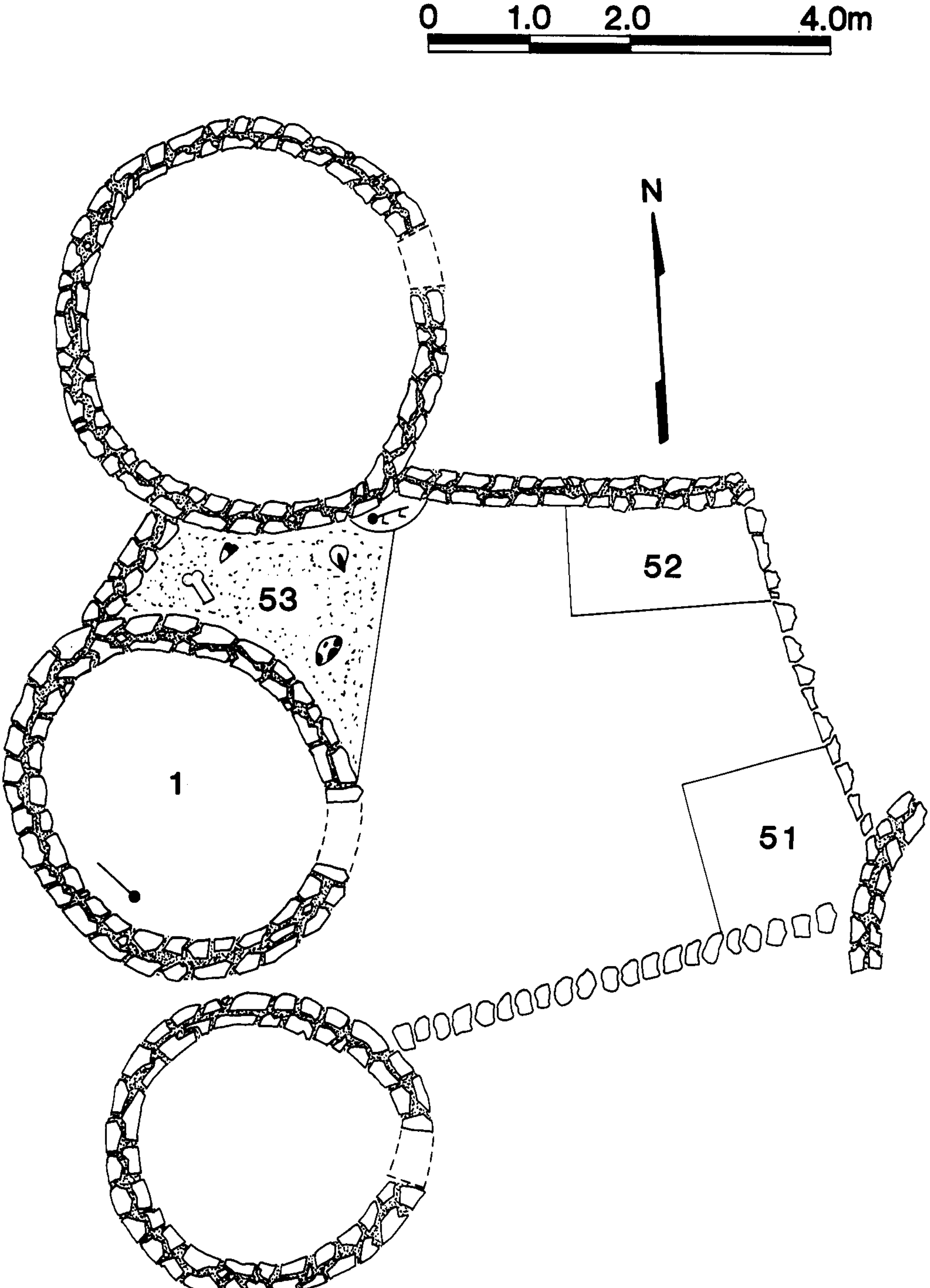

Figure 4.4. Architectural Division J7=9, a commoner residential compound at Wanka II Tunanmarca.

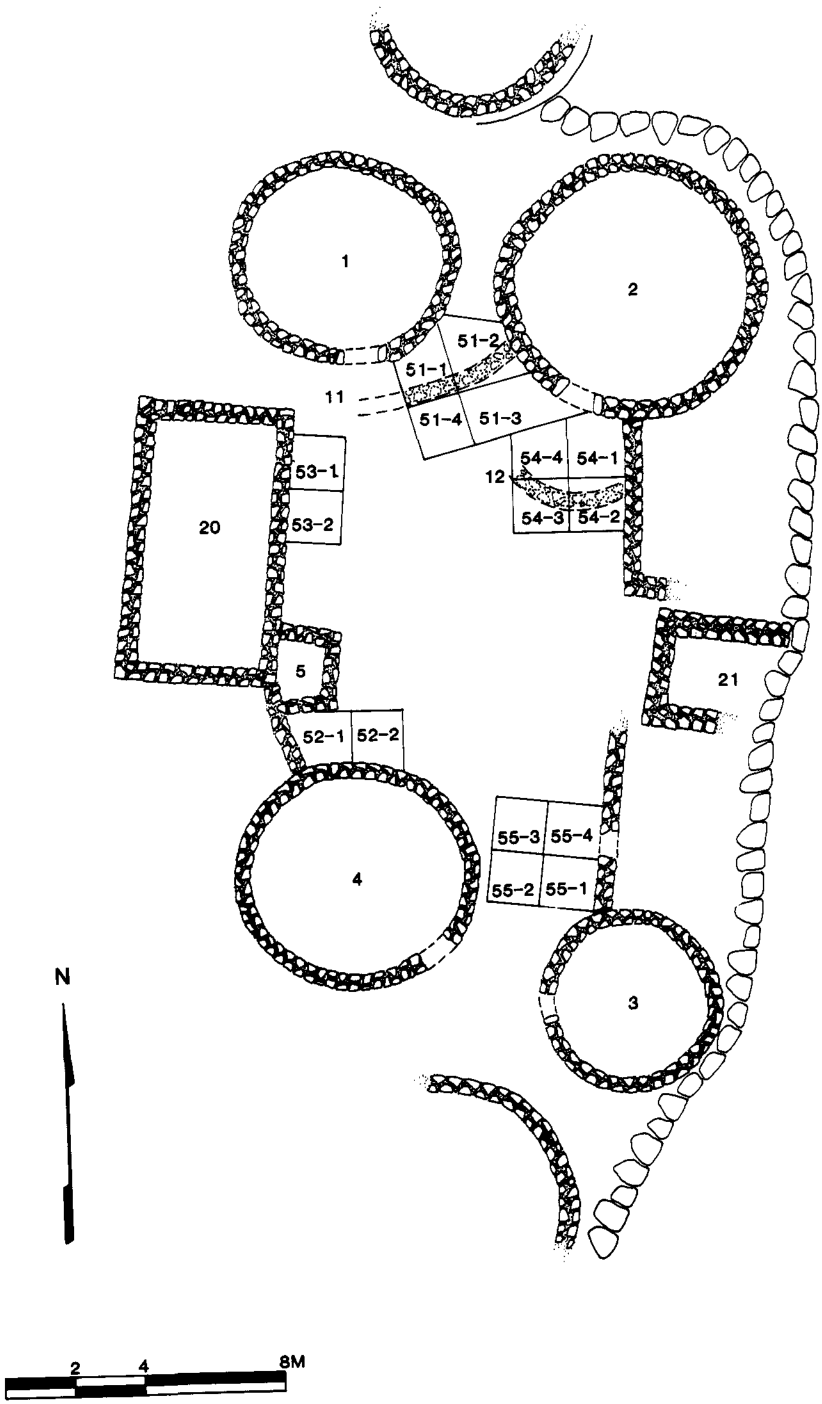

Figure 4.5. Architectural Division J2=1, an elite residential compound at Wanka III Hatunmarca.

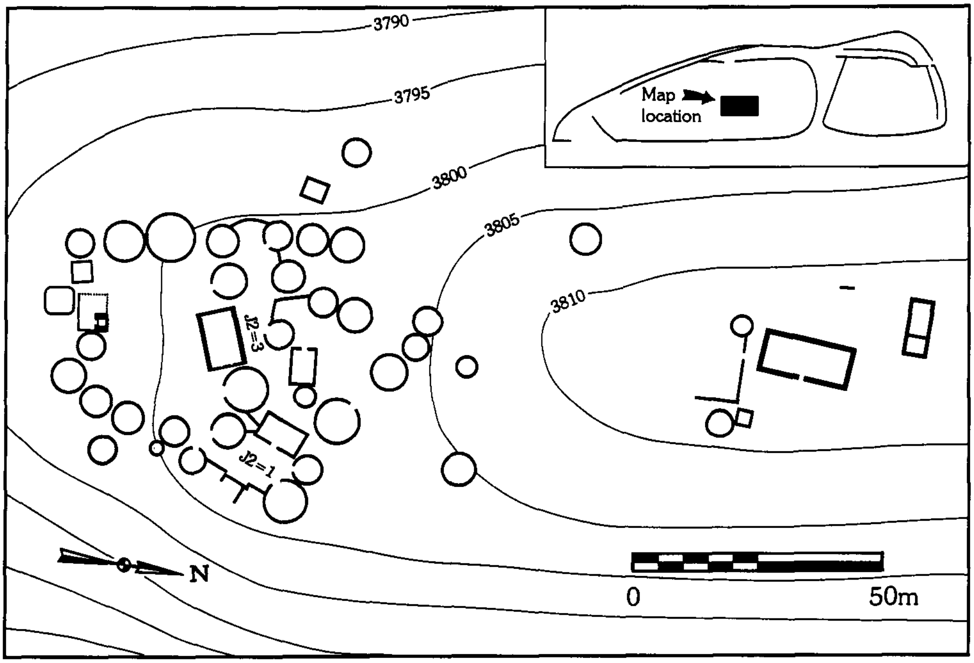

Figure 4.6. Elite architectural sector at Wanka III Hatunmarca; note the rectangular buildings, imitative of the lnka style.

compounds in 1982 showed that the materials in the open patio areas tended to be densest and better-preserved along walls, especially in comers where midden accumulated. Preliminary analyses showed no significant differences in the content of materials recovered from the center or edges of the open patio areas. Therefore, the excavations in open patio areas in 1983 concentrated on the areas along the walls.

Provenience Format

Throughout this volume, the authors refer to proveniences according to the following string: Site=AD-ASD-Unit-Level-Locus/Point. A typical string is as follows: J2=3-54- 1-4-2/5, which may be interpreted as follows. The site is *J2,* or site 2 in the *Jauju* region; in the example, the site is Hatunmarca. The number 3 refers to Architectural Division *(AD)* 3 within the site; normally, an AD will be a residential compound. The Architectural Subdivision *(ASD)* refers to a division internal to the compound, in this case *54.* Surface structures with a circular floor plan are numbered 1–9; subsurface circular structures, 10–19; rectangular surface structures, 20–29; surface rectangular structures, 30–39; and open patio areas, 50–69. The *unit* is the horizontal excavation division within the ASD, in this case *1.*

Units are typically 1.5 x 1.5 m squares in open areas and rectangular structures. In circular structures, they constitute 1/4 divisions (wedges) unless they noticeably exceeded 2.25 m^2, in which case additional units were laid out. The *level* is the vertical unit of excavation (here 4). This was a natural level unless it exceeded 15 cm, at which point it was terminated and another begun. The term *locus—2* in this example—refers to a distinctive depositional context such as an ash lens, a midden, a burial, a hearth, a floor, a pit, or a wall. The same locus may extend through more than one level or unit. The number following the front-slash— *5* in the example—refers to a sequentially numbered, point-provenienced object or sample within a locus. Most frequently, these materials are flotation samples, objects on living surfaces, and objects and skeletons in burials.

The contributors also refer to *occupational* and *nonoccupational* depositional contexts, the former referring to those contexts of recovery that were directly associated with the use of the patio group during its service as a residential compound, including such deposits as living floors, stratigraphically associated pits and open patio areas, and exterior middens. Nonoccupational contexts include such deposits as subfloor fill, fallen wall, intrusive burials, and postdepositional accumulations. The distinction between the two kinds of deposits is crucial because our research design required that analyses be focused on those materials that pertained to the residential activities of architectural units. Unless otherwise stated, *the excavated data analyzed in this volume pertain only to occupational contexts.*

THE SAMPLE AND THE REGIONAL ARCHAEOLOGICAL RECORD

In order to justify extrapolating the patterns seen in the excavated samples to the larger populations, we need to examine two issues concerning the composition of UMARP's materials. The narrower, archaeological problem has two aspects: the relationship between the sites studied and the population of sites in the region, and the relationship between the residential compounds that were excavated and the population of compounds from which the sample was drawn. The conceptually more comprehensive issue concerns the relationship between the levels at which we have sampled and the nature of the society. We examine each point in turn.

Comparisons at the Site Level

The settlement hierarchies for WII and III are illustrated in Figure 4.7, according to estimated population. The shape of the WII settlement distribution ($N = 38$) shows a relatively high number of small sites and a long tail of large sites. It can be seen that we drew our sample of residential compounds from three of the largest four sites in the survey area: Tunanmarca, Hatunmarca, and Umpamalca. Only Llamap Shillón, to the west of the Yanamarca Valley, was not investigated through excavation; we had not surveyed the drainage in which this site lies until midway through the domestic economy project. Therefore, it seems probable that we sampled from the top end of the region's sociopolitical and economic hierarchy. The very modest households that we excavated in these settlements probably represent a reasonable, although not a fully comprehensive, sample of the commoner population. The sample lacks small villages, hamlets, and isolated herding

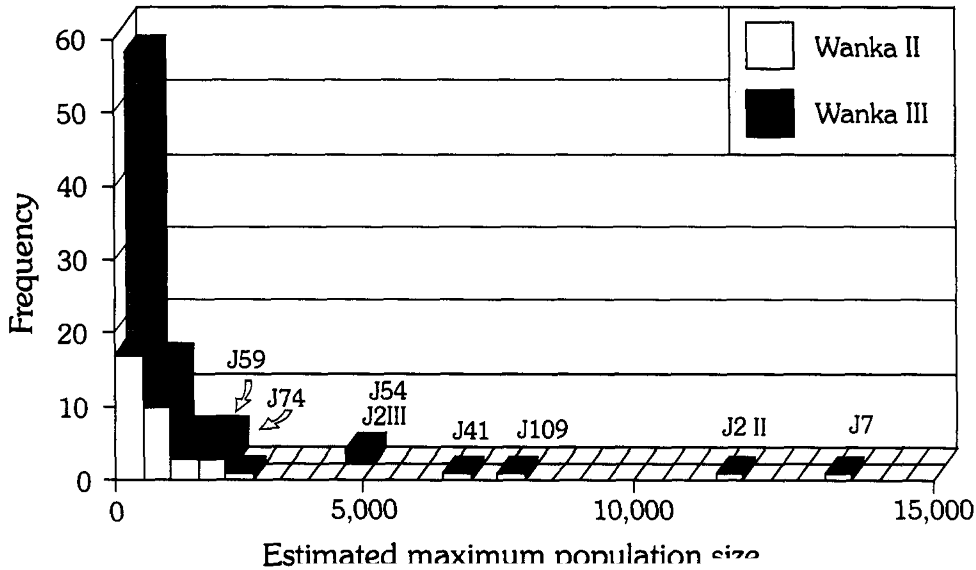

Figure 4.7. Wanka II–III settlement hierarchies, according to estimated population.

communities, especially at high elevations. Because these small sites are very difficult to date, we cannot be absolutely assured of their contemporaneity with the large centers, although our best evidence suggests that they were occupied simultaneously.

For the WIII population analysis, only those sites with two or more clearly Inka sherds in the surface collections were included, and all state facilities are excluded. The excavated sites from WIII are also from the upper end of the settlement hierarchy, not from the dispersed small villages and hamlets in which much ofthe populace lived. In contrast to the WII pattern, only Hatunmarca and Marca stand out from the WIII cluster at the lower end of the chart. Each of these is little more than 60% of the size of the fourth-largest WII site, Umpamalca. Huancas de la Cruz and Chucchus, large villages in our terminology, belong to the continuous distribution at the lower end of the graph.

Comparisons within Sites

Earlier, we stated that the categories *elite* and *commoner* were sampling classes and that they do not necessarily correspond to social statuses, which may have been more continuous than discrete. In addition, our procedures emphasized the elite compounds. Nonetheless, the excavated sample appears to represent the range of households present at the sites studied fairly well. There are several grounds for making this judgment. One stems from the combined use of architectural stratification and the randomizing element introduced into the sampling. To assess the assertion more concretely, however, we may examine the relationship between the nature of the architectural units (buildings and compounds) that were excavated and those measured during broader surface architectural studies of Tunanmarca and Hatunmarca (Table 4.4; see also DeMarrais, Chapter 6, this volume).

Tunanmarca

In 1983, Catherine Scott studied the surface architecture of Tunanmarca. She chose one area in each of the two major architectural sectors by randomly selecting one quadrant, and an angle and distance from the centerpoint of the major sector. In the N sector, the SE quadrant was chosen, and in the S sector, the N quadrant was chosen. Within the two quadrants, Scott took detailed measurements of a total of 127 structures in 72 contiguous architectural compounds (Table 4.5; Figure 6.5). This sample constitutes 2.9% of the total estimated 4,420 structures on the site.

To assess the relationship between the excavated samples and the surface sample, we may examine five architectural features: individual interior structure areas, number of structures per compound, total roofed area per compound, open patio area per compound, and total area per compound. These variables are not independent but emphasize different aspects of the use of space and investment in construction. For this discussion, the sample structures and compounds have each been pooled into single distributions.

The distribution of the number of structures per compound descends smoothly from the mode of 1 structure per compound to 5 (Figure 4.8a). In Figure 4.8c, the frequencies have been normalized, to emphasize the patterning.[1] The modal value of the commoner excavated compounds similarly lies at 1 structure per compound and descends to 2 and 3; no compound with 4 or more structures was classified as commoner in the sampling procedure. In contrast, the 2 elite excavated compounds each contain 6 structures, falling beyond the limits of the surface sample. By this criterion, the excavated commoner compounds provide a fair representation of the lower end of the scale, whereas the elite compounds are at the far, upper end of the scale.

The interior area per structure presents a more complicated picture. Figures 4.8b and 4.8d graph the relationship between the surface sample and the commoner and elite compounds, respectively. The interior sizes of structures in commoner and elite compounds both fall toward the central part of the surface sample distribution; they also overlap considerably with one another. The mean of the surface sample is 8.9 m^2, only negligibly different from the overall excavated sample mean of 8.5 m^2; the commoner mean is 7.5 m^2, and that of the elites 9.5 m^2. The 12 elite structures are split evenly on either side of the surface median value of 8.3 m^2, whereas 6 of the 9 commoner structures fall below the median. Overall, then, the difference between the commoner and elite structure sizes is noticeable but not remarkable. Even so, the four structures with the largest interior area were found in elite compounds. These are not the largest structures on the site given that there are at least 14 circular buildings with interior areas exceeding 16.05 m^2, or two standard deviations above the mean. Eleven of these buildings are found in the southern sector, several of them near the excavated compounds J7=2 and J7=3. The interior areas of commoner compounds were focused around the mode of the surface sample, in the interval

[1] Frequencies for surface architectural data were converted to normalized values by setting the highest value at 100 and multiplying the remaining values proportionately. The excavated compounds were similarly normalized by setting the largest value for any excavated compound equal to 100 and multiplying the remaining values proportionately. For example, if the highest frequency for number of structures per compound was 25, that value would be converted to 100 and all other frequencies would be multiplied by 4. This conversion brings distributions with substantially different frequencies into comparable scales for ease of comparison.

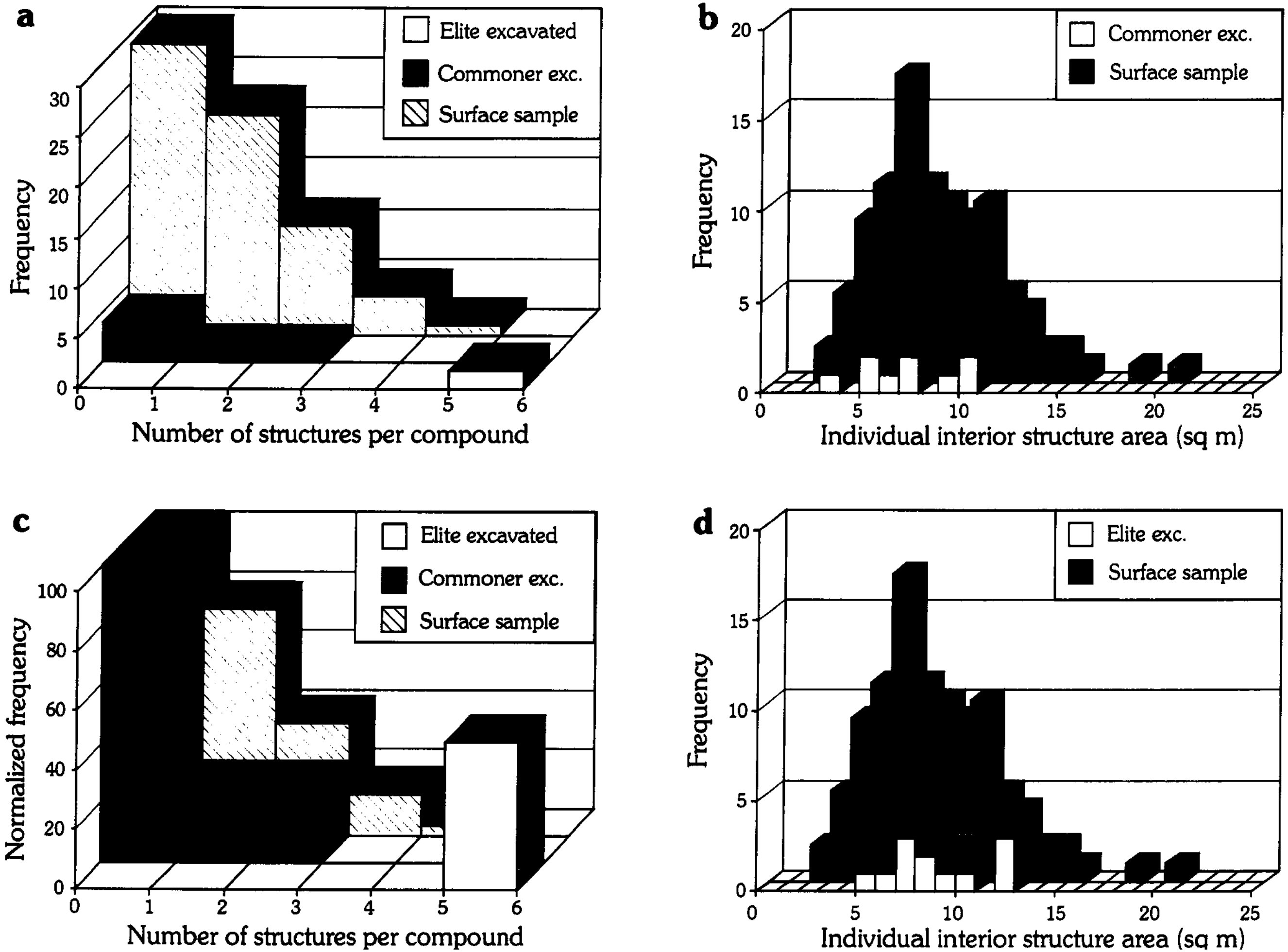

Figure 4.8. Architectural measurements at Tunanmarca: number of structures per compound and individual interior structure areas.

6.1–7.0m^2. Moreover, the 3 smallest structures were found in commoner patio groups J7=4, J7=5, and J7=9, spatially the most marginal compounds excavated. These data together indicate that despite the overlap in individual structure sizes, the elite and commoner structure samples are distinguishable in overall scale and location.

The total roofed area per compound is obviously related to the number of structures and the interior area per structure (Figure 4.9a). The joint effect of these two variables, however, emphasizes the distinction between the excavated elite compounds on the one hand, and the surface and excavated commoner samples on the other. It additionally pushes the commoner compounds toward the lower end of the surface distribution, cleanly separating the two excavated sampling categories. The open patio area values parallel the pattern seen in total roofed area, with the distinction that the elite compounds fall within the upper tail of the surface sample.

The total compound area (Figure 4.9c) constitutes the sum of the roofed and open patio measures (Figure 4.9b). Because the covered and exposed areas may have been used for different activities, a direct positive relationship between the two can not be assumed (DeMarrais, Chapter 6, this volume). Some households, for instance, may have opted to limit structure sizes in favor of a large open space, because they held valued social and ceremonial activities in the open areas. Keeping this reservation in mind, we still see that the plot places the commoner compounds below the central part of the surface distribution and the elites at and beyond the upper end.

The overall architectural patterns at Tunanmarca may be summarized as follows: first, residential compounds generally had only one or two structures each—pattern paralleled in the commoner excavated sample—whereas the elite sample fell beyond the upper limits of the surface sample. Second, the measures of area together suggest that space was used to distinguish status. Third, distinctions between the two statuses are present in both the number of structures present and all measures of area, except area per structure, in which the categories overlap. It appears that the average size of structures in a compound may have been less important a marker of status distinction than the size of the largest structure and the total roofed area. Overall, then, the strategy to choose compounds for excavation at Tunanmarca appears to have resulted in selection of a reasonable cross-section of residential compounds, with the notable caveat that the elite compounds studied were very elite.

Hatunmarca

The destruction resulting from long-term farming at Hatunmarca precluded study of the surface remains in a similar manner. Instead, we collected sitewide data on surface architecture by taking measurements on all preserved structures within or bordering 55 fields from which surface collections were taken. The site was divided into 11 strata of approximately equal size (about 15 ha), using pathways, large open spaces, internal walls, and architectural variation to define borders (D'Altroy, 1992:Figure 9.12). Within each stratum, 5 fields were chosen randomly for collection. This procedure yielded 55 pooled samples and from each we collected surface materials. This cross-section of buildings is arguably more representative of the architecture at Hatunmarca than the two large samples taken at Tunanmarca. The Hatunmarca surface data regrettably include no information on overall compound characteristics, however, because complete architectural units were

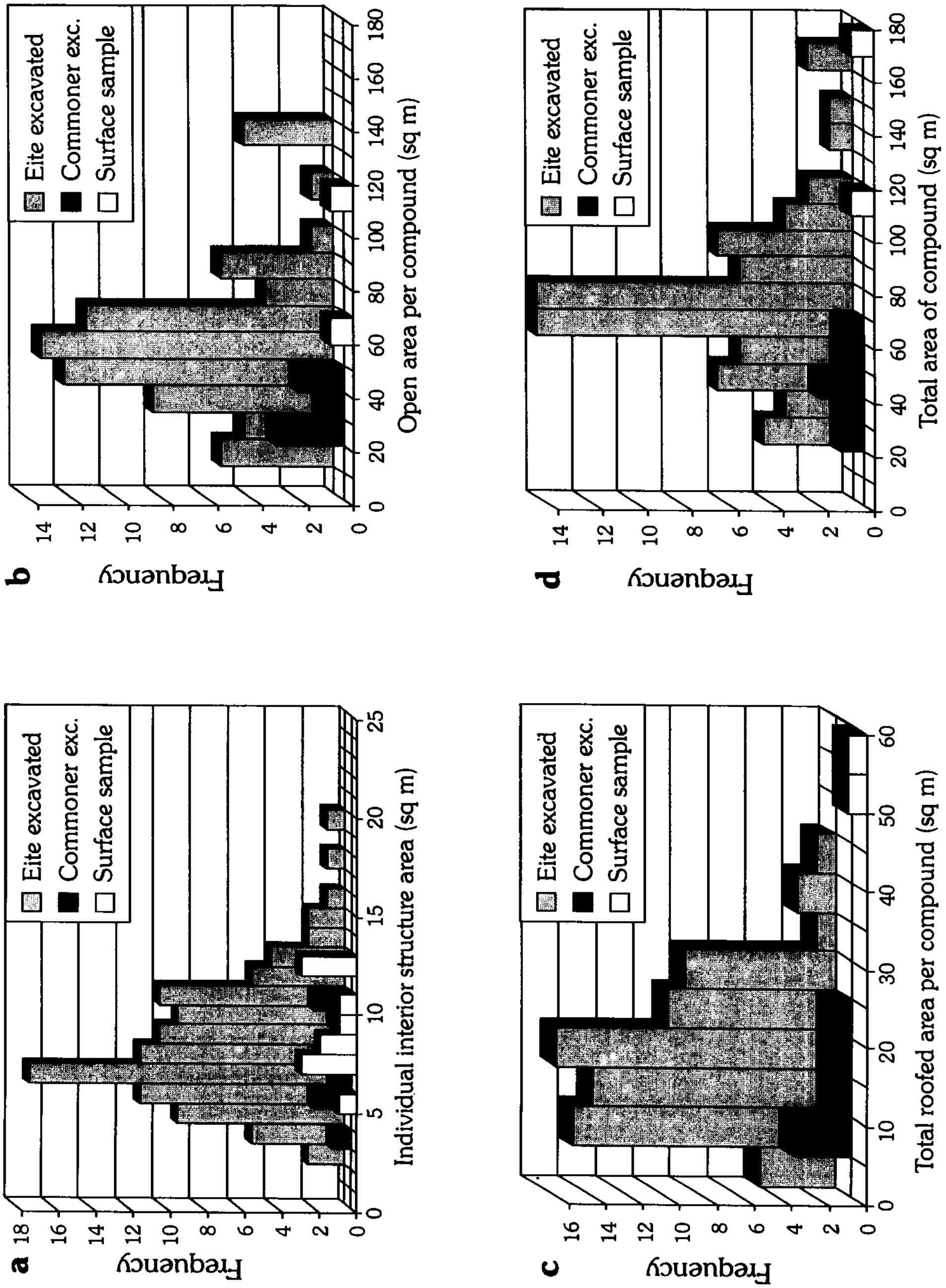

Figure 4.9. Architectural dimensions at Tunanmarca: a) roofed areas; b) open areas. and c) total area of compounds.

unevenly preserved. The surface data will again be pooled into a single distribution for comparison with the excavated commoner and elite compounds.

The overall distribution of the sizes of surface structures at Hatunmarca is skewed to the right in a manner analogous to that of J7 (Figure 4.10a). One prominent outlier squeezes the remainder of the distribution and distorts the mean as a measure of central tendency. Because this centrally located building was likely used for ceremonial or public activities, it will be held out of the rest of the present discussion. During postexcavation analyses, we discovered that one of the three patio groups chosen for excavation (J2=4) was solely a WII compound. The number of structures excavated at this settlement thus favors the elite occupation more heavily than we had intended. As at Tunanmarca, the sizes of the elite and 4.11a,b, 4.12; Table 4.6). The total roofed area per compound, open area per compound, and total area per compound all show a comparable pattern. The Hatunmarca elite samples have the largest values, followed by the Tunanmarca elite, and then the overlapping Hatunmarca and Tunanmarca commoners. To illustrate the trends in distributions of individual structures, the samples have been normalized and pooled at intervals of 5 m^2 in Figures 4.12a,b. These graphs show that, although the samples overlap, each category of structure in the Hatunmarca samples (Figure 4.11a; Figure 4.12d) is bigger than its Tunanmarca counterpart (Figure 4.11a; Figure 4.12c). The 57 surface and commoner distributions are almost precisely parallel, whereas the elite distribution peaks at the same place (5–10 m^2 interval) but lies a bit to the right of the commoner plot. The Hatunmarca plots are markedly different; the surface and elite samples both show peak frequencies for structures between 10–15 m^2, a parallel falloff, and a modest peak at 30–35 m^2. Both the surface and elite samples contain tails that lie to the right (larger) of the commoner sample.

Collectively, these patterns suggest that UMARP's excavated sample from Hatunmarca is a reliable representation of the global population of structures at the site. However, because this settlement was occupied in WII and III (actually Wanka I–IV), we need to separate the two phases as best as possible for further analyses. As described earlier, we estimate that the residential area occupied decreased from 73.7 ha (WII) to 27.4 ha (WIII), reducing the number of pertinent surface collection samples from 55 to 27.

Summary

This evidence indicates that the sample contains a reasonable cross-section of WII and III residential compounds, especially given the vagaries of archaeological preservation. The concordance between the pooled surface samples and the pooled excavated samples, in particular, gives us confidence in the utility of the data for addressing the questions laid out in Chapter 2. Given the further correspondence between these sampling categories and patterns of artifactual relationships, described throughout Part II of this volume, UMARP's excavated materials appear to represent Xauxa society's residential material remains quite well. The architectural complexities should nonetheless caution us that the elite and commoner sampling categories condensed a certain amount of household variation into two strata. In several chapters, the contributors make an effort to describe the degree to which these two categories are parts of a continuum or represent distinct socioeconomic statuses.

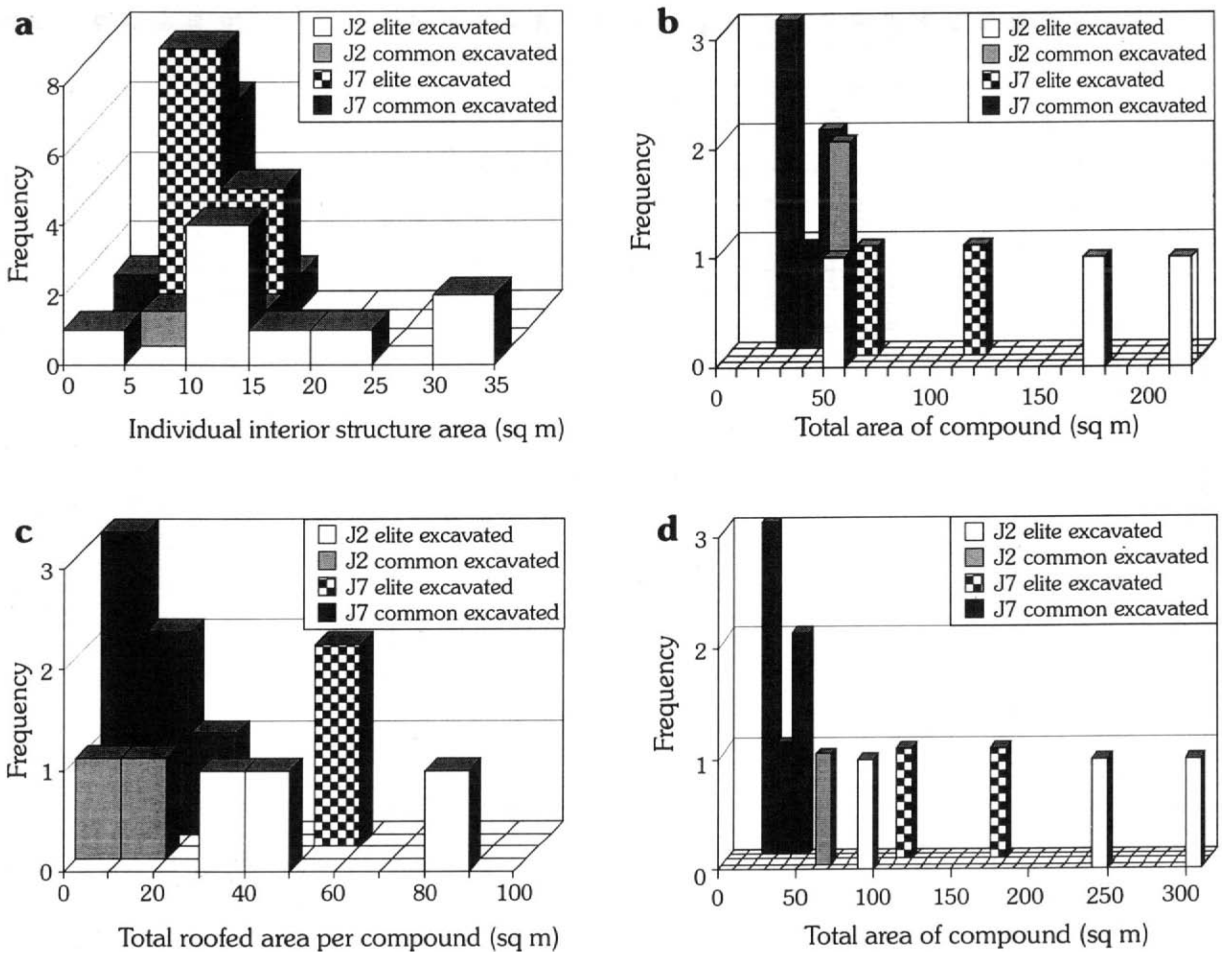

Figure 4.10. Comparison of interior structure areas for the Hatunmarca (J2) and excavated samples and the Tunanmarca (J7) sample.

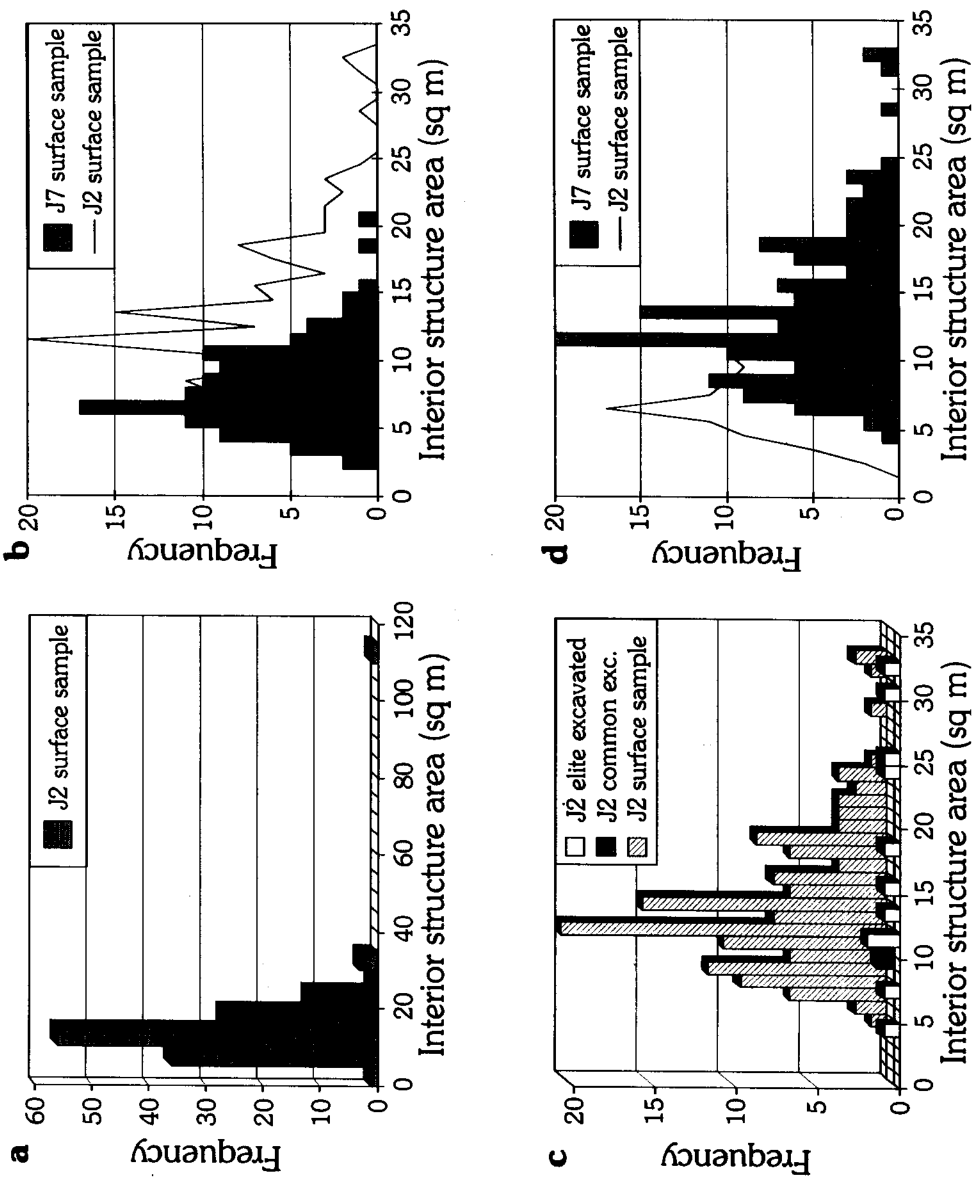

Figure 4.11. Comparison of architectural measurements for structures and residential compounds at Hatunmarca (J2) and Tunanmarca (J7).

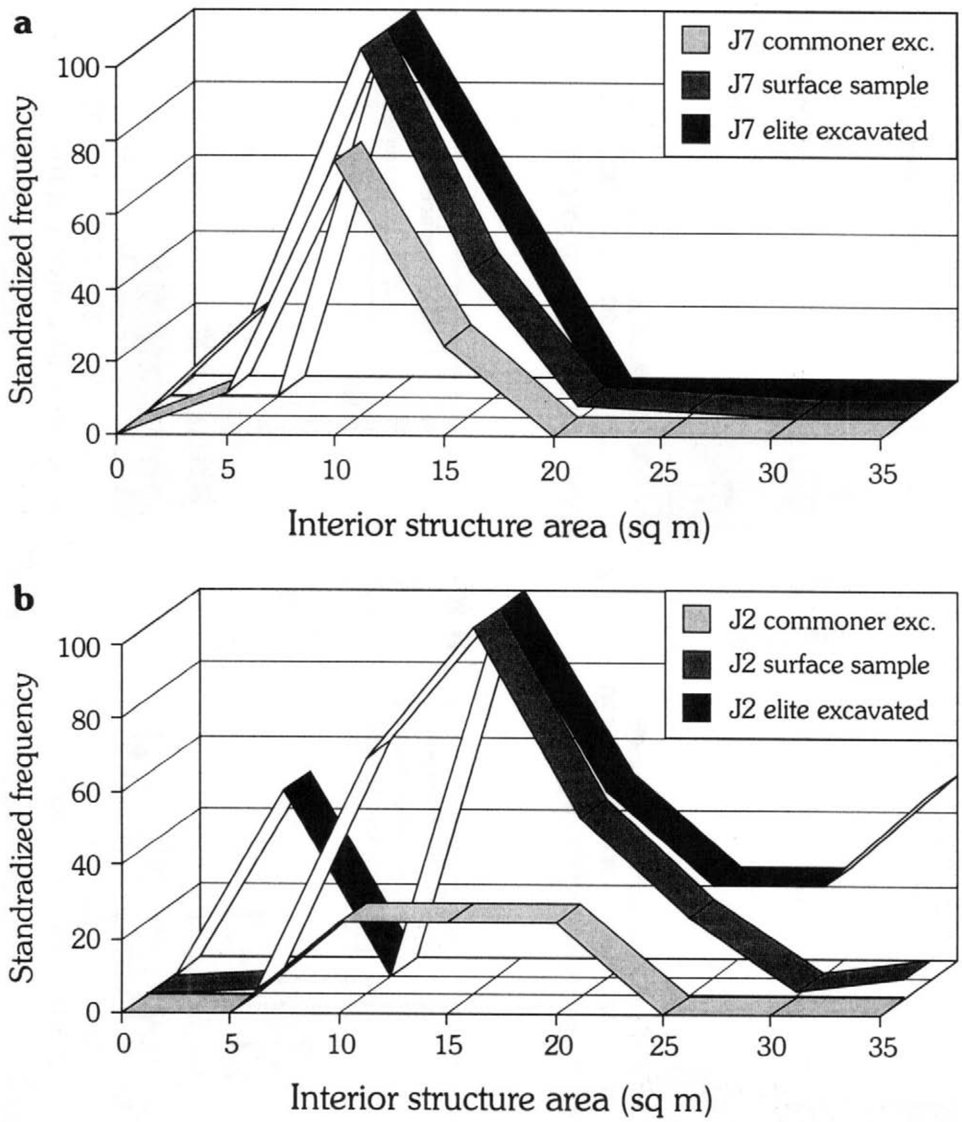

Figure 4.12. Comparison of architectural measurements for structures at Hatunmarca (J2) and Tunanmarca (J7) using normalized values.

ARCHAEOLOGICAL SAMPLING AND INDIGENOUS SOCIAL GROUPS

To conclude this chapter, I would like to consider the relationship between the levels of analysis employed in the sampling strategy and the social formations of late prehistory. The early Colonial documents described in Chapter 2 suggest that the native society of the fourteenth and fifteenth centuries A.D. was comparable to ethnographically recorded chiefdoms (Earle, 1997). Before they lost their sovereignty to the Inka state, sets of internally ranked, allied communities apparently coordinated some activities, competing for resources with neighboring alliances (LeBlanc, 1981). Although analysis of regional organization must take these multicommunity polities in account, it is difficult to recognize their scope and organization archaeologically.

Our best evidence for recognizing intercommunity relations lies in the distributions of ceramic styles and lithic materials that suggest differences in interaction among neighboring Xauxa communities (LeBlanc, 1981; Costin, 1986; Russell, 1988). Both Tunanmarca and Hatunmarca appear to have been centers surrounded by satellite communities, but we cannot yet argue for a direct correspondence between political entities and the sets of communities linked through ceramic similarities. Although we may surmise that economic interaction and political alliances paralleled one another, identifying multicommunity polities remains problematic in practice. The degree to which the populations resident in the communities acted independently or in concert is one ofthe key questions yet to be resolved satisfactorily.

Within local alliances, the largest corporate group was probably the *ayllu,* whose population could range into hundreds or even thousands ofhouseholds. Although historical data suggest that *ayllu* may have lived in discrete sections ofcommunities (e.g., Cock, 1977), several factors confound their ready identification in the archaeological record. One dilemma is that entities called *ayllu* in the early documents varied in their scope, since both segments and complete social groupings were often termed *ayllu.* Moreover, an *ayllu's* members could be dispersed among several residential communities to exploit the varied resources found in the vertically compressed environment (Murra, 1975, 1980; Rostworowski de Diez Canseco, 1978, 1983). Evidence from the nearby Junín and Tarma regions suggests that social groups may have often divided their members into paired settlements (Parsons, Hasting, and Matos Mendieta, 1998), but members of different *ayllu* could also live in the same settlement (Espinoza Soriano, 1969; Murra, 1972). Although the Andean ideal was apparently for each *ayllu* to be economically self-sufficient, early inspections recorded exchange between politically nonaligned groups that did not have access to the full range of highland resources (e.g., Ortiz de Zúñiga, 1967, 1972). Furthermore, the kinds of social and economic linkages that we discussed in Chapter 1 suggest that we should be looking for variations that distinguished, crosscut, and internally divided social groups.

Many towns and villages in the Andean highlands were divided into residential sectors but only rarely can we show that these housed a specific social group. Cuzco itself probably provides the best example of correspondence between social divisions and residential locations. There the settlement was divided into upper and lower sectors that corresponded to the *hanan* and *hurin* social divisions (see Rowe, 1967; Gasparini and Margolies, 1980; Hyslop, 1990:29–68). Other Inka settlements, such as Inkawasi in the Cañete Valley, Peru, and Tumipampa in southern Ecuador, were said to have been built as New Cuzcos. However, using the example of a planned imperial capital—or any other state installation—as a demonstration of settlement organization throughout the empire is a chancy business at best. If we turn to non-Inka, late prehistoric settlements, there is some suggestive, but not conclusive, evidence for concordance of architectural sectors and social divisions (Netherly and Dillehay, 1986).

In summary, with present evidence, we can argue for only a partial correspondence between the traditional sociopolitical groups highlighted in the historical record and the discrete architectural units visible in the archaeological record; that is, even though the *ayllu* is recorded historically as the socioeconomic foundation of the Upper Mantaro populace, we cannot clearly identify it archaeologically. There is a somewhat better, but inconclusive, match at the level of the indigenous polity. The best fits lie at the household and residential community level, and architecturally defined sectors within settlements hold promise for future study of internal community organization (see Chapter 6, this volume). As the sampling design described here indicates, UMARP has chosen to focus on the household and settlement for collecting archaeological data but our analyses have tried to take all major groupings into consideration.

In the lengthy period between our conception of the project and the publication of this volume, archaeologists have made notable advances in the study of households and the domestic economy. As our data analysis progressed, we began to examine both finer distinctions and broader issues than those we had originally laid out. At the outset, we did not distinguish clearly between households as socioeconomic units and the behavioral activities conducted within the domestic economy, It has become increasingly clear that the residential household is best seen as a focal point of activity, however, not as an enclosed social entity. Its membership varies over time and its members participate in society in distinctive ways. The accumulation of material remains in the residential compounds is therefore not a result of activities of its members solely as part of that household. Over time, as our understanding of the indigenous society advanced, our ability to refine our interpretations improved. As it turns out, however, the field strategy described here probably would not have changed markedly had we known more initially, although it surely would have been more informed. In the subsequent discussions, we remain largely faithful to the original conception of the project but extend the theoretical questions and analyses beyond those originally proposed.

Table 4.2. Wanka II Site Sizes and Population Estimates

Site No.	Site name	Site area (ha)	Minimum population	Maximum population	Site classification	Regional rank
2	Hatunmarca	73.7	6,633	11,055	Regional center	2
7	Tunanmarca	25.4	7,955	13,259	Regional center	1
8	—	5.4	486	810	Large village	16
37	—	6.0	540	900	Large village	12
38	—	4.9	441	735	Large village	18
39	—	4.1	369	615	Large village	19
40	—	5.6	504	840	Large village	15
41	Umpamalca	14.8	3,889	6,482	Town	4
46	—	6.0	540	900	Large village	13
53	—	1.5	135	225	Small village	30
108	Huacjrasmarca	4.1	369	615	Large village	20
109	Llamap Shillon	18.6	4,374	7,290	Town	3
113	—	2.0	184	306	Small village	27
139	—	7.0	630	1,050	Large village	11
142	—	2.8	252	420	Small village	22
145	—	1.5	135	225	Small village	31
201	—	1.5	135	225	Small village	32
206	—	6.0	540	900	Large village	14
207	—	1.0	90	150	Small village	35
213	—	0.5	45	75	Hamlet	38
220	—	12.2	1,098	1,830	Large village	6
228	—	2.7	243	405	Small village	24
231	—	2.1	189	315	Small village	26
246	—	2.8	252	420	Small village	23
269	—	1.2	108	180	Small village	33
287	—	5.1	459	765	Large village	17
289	—	15.1	1,359	2,265	Large village	5
290	—	7.4	666	1,110	Large village	10
291	—	2.4	216	360	Small village	25
295	—	1.6	144	240	Small village	28
296	—	1.6	144	240	Small village	29
297	—	0.8	72	120	Small village	36
298	—	0.8	72	120	Small village	37
300	—	8.1	729	1,215	Large village	9
304	—	11.8	1,062	1,770	Large village	7
305	—	3.5	315	525	Large village	21
306	—	11.6	1,044	1,740	Large village	8
327	—	1.1	99	165	Small village	34
	Total	284.3	36,517	60,862		

Table 4.3. Wanka III and Inka Site and Population Estimates

Site No.	Site name	Elev (m)	Inka/ Xauxa	Area (ha)	Minimum population	Maximum population	Site classification	Regional rank	Group rank Inka	W III
1	Pancan	3,390	Xauxa	1.8	I62	270	Small village	33	—	31
2	Hatunmarca	3,750	Xauxa	27.4	2,466	4,110	Town	3	—	2
3	—	3,420	Xauxa	1.4	126	210	Small village	41	—	38
4	Tragadero	3,400	Inka	5.9	455	759	Small Inka facility	19	2	—
5	Hatun Xauxa	3,350	Inka	46.6	4,194	6,990	Inka center	1	1	—
6	—	3,350	Inka	0.7	63	105	Inka road station	58	6	—
8	—	3,800	Xauxa	5.4	486	810	Largevillage	16	—	15
9	—	3,500	Xauxa	9.3	837	1,395	Sarge village	8	—	7
37	—	3,900	Xauxa	6.0	108	180	Small village	44	—	41
38	—	3,875	Xauxa	4.9	I47	245	Smallvillage	37	—	34
42	—	3,750	Xauxa	3.3	297	495	Small village	22	—	20
43	—	3,650	Xauxa	1.9	146	244	Small village	38	—	35
45	—	3,550	Inka	1.2	108	180	Inkaroad station	43	4	—
46	—	3.700	Xauxa	3.4	77	128	Small village	55	—	51
47	—	3,475	Xauxa	6.0	463	771	Largevillage	17	—	16
48	—	3,675	Xauxa	5.3	59	99	Hamlet	61	—	55
49	—	3,575	Xauxa	11.1	599	999	Largevillage	11	—	10
50	—	3,460	Xauxa	1.6	144	240	Small village	39	—	36
51	—	3,460	Xauxa	0.7	16	26	Hamlet	72	—	67
53	—	3,625	Xauxa	1.7	16	26	Hamlet	73	—	66
54	Marca	3,600	Xauxa	27.6	2,484	4,140	Town	2	—	1
55	—	3,675	Inka	1.1	99	165	Inka facility	47	5	—
59	Huancas de la Cruz	3,550	Xauxa	11.2	1,008	1,680	Largevillage	6	—	5
60	—	3,450	Xauxa	2.3	207	345	Small village	29	—	27
63	Cutocuto	3,550	Inka	2.1	189	315	Inka facility	32	3	—
74	Chucchus	3,575	Xauxa	13.2	1,056	1,760	Large village	5	—	4
75	—	3,850	Xauxa	1.0	18	30	Hamlet	71	—	65
105	—	3,675	Xauxa	0.6	54	90	Hamlet	63	—	57
106	—	3,700	Xauxa	0.9	81	135	Small village	53	—	49
108	—	3,800	Xauxa	4.1	295	492	Small village	23	—	21
110	—	3,850	Xauxa	2.2	198	330	Small village	31	—	29
113	—	3,900	Xauxa	10.2	918	1,530	Large village	7	—	6
116	—	3,900	Xauxa	5.6	504	840	Large village	15	—	14
117	—	3,575	Xauxa	12.0	540	900	Large village	14	—	13
118	—	3,475	Xauxa	0.5	45	75	Hamlet	67	—	61
119	—	3,775	Xauxa	7.1	639	1,065	Largevillage	10	—	9
120	—	3,600	Xauxa	0.9	81	135	Small village	54	—	48

(continued)

Table 4.3. *(continued)*

Site No.	Site name	Elev. (m)	Inka/ Xauxa	Area (ha)	Minimum population	Maximum population	Site classification	Regional rank	Group rank Inka	W III
130	—	3.450	Xauxa	10.0	150	250	Small village	35	—	32
131	—	3,500	Xauxa	1.7	77	128	Small village	56	—	50
137	—	3,450	Xauxa	2.6	117	195	Small village	42	—	39
139	—	3.550	Xauxa	7.0	210	350	Small village	28	—	26
142	—	3,540	Xauxa	2.8	84	140	Small village	51	—	46
201	—	3,450	Xauxa	0.4	12	20	Hamlet	74	—	68
212	—	3,550	Xauxa	1.0	30	50	Hamlet	70	—	64
221	—	3,500	Xauxa	10.0	128	214	Small village	40	—	37
224	—	3,400	Xauxa	1.4	63	105	Small village	59	—	54
226	—	3,400	Xauxa	1.8	162	270	Small village	34	—	30
227	—	3,400	Xauxa	3.3	149	248	Small village	36	—	33
228	—	3,400	Xauxa	2.7	243	405	Small village	25	—	23
231	—	3,800	Xauxa	2.1	63	105	Smallvillage	60	—	53
243	—	3,450	Xauxa	4.8	86	144	Small village	50	—	45
246	—	3,370	Xauxa	2.8	50	84	Hamlet	66	—	60
247	—	3,800	Xauxa	0.3	9	15	Hamlet	75	—	69
252	—	3,550	Xauxa	9.2	828	1,380	Largevillage	9	—	8
266	—	3,375	Xauxa	3.4	I02	170	Small village	46	—	42
267	—	3,400	Xauxa	6.7	201	335	Small village	30	—	28
268	—	3,350	Xauxa	3.8	228	380	Small village	26	—	24
269	—	3,300	Xauxa	1.2	54	90	Hamlet	64	—	58
270	—	3,450	Xauxa	1.4	84	140	Small village	52	—	47
272	—	3,350	Xauxa	2.5	225	375	Small village	27	—	25
281	—	3,540	Xauxa	2.9	87	145	Small village	49	—	44
285	—	3,450	Xauxa	6.4	461	768	Largevillage	18	—	17
286	—	3,370	Xauxa	1.3	59	98	Hamlet	62	—	56
288	—	3,500	Xauxa	4.0	360	600	Largevillage	20	—	19
291	—	3,400	Xauxa	2.2	97	162	Small village	48	—	43
293	—	3,400	Xauxa	9.1	574	956	Largevillage	13	—	12
294	—	3,350	Xauxa	1.2	108	180	Small village	45	—	40
295	—	3,375	Xauxa	1.2	54	90	Hamlet	65	—	59
297	—	3,400	Xauxa	0.8	36	60	Hamlet	68	—	63
298	—	3,400	Xauxa	0.8	36	60	Hamlet	69	—	62
300	—	3,425	Xauxa	8.1	583	972	Largevillage	12	—	11
304	—	3,650	Xauxa	11.6	261	435	Small village	24	—	22
310	—	3,350	Xauxa	0.7	72	120	Small village	57	—	52
313	—	3,600	Xauxa	13.0	1,173	1,954	Large village	4	—	3
323	—	3,350	Xauxa	4.0	360	600	Large village	21	—	18
	Total		lnka	57.6	5,108	8,5I4				
			Xauxa	340.5	21,953	36,589				
			Total	398.1	27,062	45,103				

Table 4.4: Summary statistics for architecture at Wanka II and Wanka III sites.

			Individual structure areas				Freq. of structures/patio group				Roofed area/patio group				Open area/patio group				Total area/patio group			
Sample	No. of str.	No. of pg.	Mean (sq m)	Std. dev.	Med. (sq m)	Mode (sq m)	Mean	Std. dev.	Med.	Mode	Mean (sq m)	Std. dev.	Med. (sq m)	Mode (sq m)	Mean (sq m)	Std. dev.	Med. (sq m)	Mode (sq m)	Mean (sq m)	Std. dev.	Med. (sq m)	Mode (sq m)
Wanka II																						
Tunanmarca																						
surfacesample	127	67	8.9	3.5	8.3	6.1-7.0	1.9	1.0	2.5	1	16.9	8.6	15.8	15.1-200	58.1	28.8	56.0	50.1-60.0	75	32.3	72.1	60.1-70.0
all exc. patio groups	21	8	8.5	2.3	8.0	5.1-10.0	2.6	2.1	1.5	1	22.3	15.7	14.2	5.1-10.0	47.9	14.2	41.2	40.1-50.0	70.2	28.9	51.0	40.1-5.0
exc. elite patio groups	I2	2	9.3	2.2	8.6	5.1-10.0	6.0	0.0	6.0	6	56.6	2.5	56.6	50.1-60.0	89.2	21.8	89.2	60.1-70.0 110.1-120.0	144.9	24.4	144.9	120.1-130.0 160.1-170.0
exc. commoner patio groups	9	6	7.5	2.1	7.6	5.1-10.0	1.5	0.8	1.0	1	11.2	6.0	8.9	5.1-10.0	34.1	8.9	33.4	20.1-30.0	45.3	12.8	46.3	40.1-50.0
Umpamalca																						
all exc. patio groups	14	6					2.3	1.1	2.5	36893	22.8	12.3	17.9	10.1-20.0	87.6	62.5	56.6	10.1-20.0	110.5	69.1	74.5	110.1-120.0
exc. elite patio groups	10	3					3.3	0.5	3.5	3	33.2	8.9	35.7	-	119.3	52.0	191.4	-	152.5	52.8	227.1	110.1-120.0
exc. commoner patio groups	43						1.3	0.5	1.5	1	12.4	2.4	13.6	10.1-20.0	56.0	55.9	135.0	10.1-20.0	68.4	56.8	148.6	-
Hatunmarca																						
exc. commoner patio groups	1	1	15.9	-	-	-	1	-	-	-	15.9	-	-	-	43.0	-	-	-	58.9	-	-	-

(continued)

Table 4.4 *(continued)*

			Individual structure areas				Freq. of structures/patio group				Roofed area/patio group				Open area/patio group				Total area/patio group			
Sample	No. of str.	No. of pg.	Mean (sq m)	Std. dev.	Med. (sq m)	Mode (sq m)	Mean	Std. dev.	Med.	Mode	Mean (sq m)	Std. dev.	Med. (sq m)	Mode (sq m)	Mean (sq m)	Std. dev.	Med. (sq m)	Mode (sq m)	Mean (sq m)	Std. dev.	Med. (sq m)	Mode (sq m)
Wanka III																						
<u>Hatunmarca</u>																						
structure surface sample	137	-	14.2	9.9	11.9	11.1-12.0																
all exc. patio groups	14	5	19.2	11.1	14.2	10.1-15.0	2.8	1.9	2.0	1	53.8	61.1	33.3	-	122.4	66.8	99.4	-	176.2	98.4	141.3	-
exc. elite patio groups	12	3	20.7	11.3	16.7	10.1-15.0	4.0	1.6	4.0	-	82.8	64.1	41.9	-	159.5	63.3	132.0	-	242.3	72.1	280.3	-
exc. commoner patio groups	2	2	10.2	0.6	10.2	5.1-15.0	1.0	0.0	1.0	1	10.2	0.6	10.2	-	66.9	1.4	66.9	-	77.1	2.0	77.1	-
Marca																						
all exc. patio groups	17	7	16.3	4.4	17.3	15.1-20.0	2.4	0.7	3.0	3	39.5	11.2	45.0	40.1-50.0	86.4	32.6	90.0	120.1-130.0	125.9	41.2	123.3	160.1-170.0
exc. elite patio groups	8	3	15.6	6.0	15.2	10.1-15.0 20.1-25.0	2.7	0.5	2.5	3	41.7	5.2	45.0	40.1-50.0	102.5	32.2	124.0	120.1-130.0	144.2	374	169.0	-
exc. commoner patio groups	9	4	16.8	1.9	17.3	15.1-20.0	2.2	0.8	2.5	-	37.8	13.9	40.3	-	74.3	21.2	75.1	-	112.1	38.5	115.4	-
<u>Huancas de la Cruz</u>																						
exc. commoner patio groups	3	1	17.0	-	-	-	3	-	-	-	17.0	-	-	-	-	-	-	-	-	-	-	-
<u>Chucchus</u>																						
exc. commoner patio groups	4	2	14.5	2.7	13.6	10.1-15.0	2.0	-	2.0	2	29.0	1.8	29.0	-	53.0	3.0	53 0	-	82.0	49	82.0	-

Table 4.5. Areas (sq m) of surface architecture sample at Wanka II Tunanmarca.

Surface sample pat. grp	Structure area	Compound roofed area	Open patio area	Total compound area	'Surface sample ,pat. grp	Structure area	Compound roofed area	Open patio area	Total compound area
1	4.9	26.1	140.0	166.1	23	9.5	9.5	62.5	72.0
	8.9				24	8.6	8.6	56.0	64.6
	12.2				25	12.3	30.0	34.0	64.0
2	12.2	12.2	137.5	149.7		7.5			
3	10.5	17.1	78.0	95.1		4.1			
	6.6					6.2			
5	4.9	4.9	59.5	64.4	27	11.0	11.0	49.0	60.0
6	6.7	19.6	57.5	77.1	28	11.0	11.0	19.2	30.3
	8.3				29	6.8	38.5	138.0	176.5
7	11.3	18.8	42.5	61.3		8.0			
	7.5					12.4			
8	5 .0	14.8	100.0	114.8		11.2			
	5.4				30	8.4	8.4	52.0	60.4
	4.4				31	12.7	28.5	45.0	73.5
9	4.7	19.6	59.5	79.1		7.4			
	6.0					8.4			
	6.2				32	7.9	7.9	33.0	40.9
	2.7				33	3.5	3.5	18.0	21.5
10	4.5	16.9	120.0	136.9	34	5.8	21.2	66.0	87.2
	6.2					8.9			
	6.2					6.5			
11	11.6	17.2	33.8	50.9	35	8.2	16.1	33.0	49.1
	5.5					7.9			
12	9.9	10.0	41.2	51.2	36	15.7	24.2	67.5	91.7
14	7.7	15.8	63.0	78.8		8.6			
	8.0				37	4.5	4.5	58.5	63.0
15	14.7	41.5	44.0	85.5	38	10.2	10.2	63.2	73.5
	12.3				39	9.3	29.8	38.0	67.8
	8.3					10.9			
	6.3					9.6			
	6.6				40	16.6	29.3	74.2	103.6
16	4.9	4.9	18.0	22.9		12.7			
17	9.1	18.2	54.0	72.2	41	2.8	10.9	61.8	72.7
	9.1					8.0			
18	11.0	19.7	25.5	45.2	42	5.1	19.5	60.0	79.5
	8.6					14.3			
20	11.2	11.2	18.0	29.2	43	13.5	25.8	66.5	92.3
21	6.4	6.4	39.0	45.4		12.3			
22	6.6	6.6	24.0	30.6					

(Continued)

Table 4.5. *(Continued)*

Surface sample gat. grp	Structure area	Compound roofed area	Open patio area	Total compound area	Surface sample pat. grp	Structure area	Compound roofed area	Open patio area	Total compound area
44	5.1	15.7	27.5	43.2	56	9.5	9.5	51.0	60.5
	10.6				58	13.7	13.7	49.5	63.2
45	14.5	14.5	60.0	74.5	59	5.3	15.8	58.5	74.3
46	18.1	35.4	131.8	167.2		10.5			
	13.9				60	9.1	9.1	56.0	65.1
	3.5				61	10.5	22.1	44.0	66.1
	7.0					11.6			
47	7.6	15.9	85.5	101.4	62	7.4	7.4	42.0	49.4
48	15.9	22.0	61.8	83.8	63	7.6	7.6	87.5	95.1
	6.2				64	5.7	13.4	24.8	38.1
49	10.5	26.6	51.0	77.6		7.7			
	12.7				65	14.2	30.6	40.0	70.6
	3.5					16.4			
50	17.3	23.9	66.0	89.9	66	13.5	22.0	46.8	68.1
	6.6					5.2			
51	8.4	24.3	43.5	67.8		3.2			
	5.1				67	12.7	12.7	87.5	100.2
	10.8				68	11.9	28.4	90.0	118.4
52	20.0	20.0	48.8	68.8		10.6			
53	8.3	23.7	68.0	91.7		5.8			
	6.4				69	9.4	9.4	76.0	85.4
	9.1				70	13.7	22.0	33.2	55.2
54	9.9	9.9	12.5	22.4		8.3			
55	3.4	9.1	63.0	72.1	71	10.8	10.8	88.0	98.8
	5.7				72	8.3	8.3	45.0	53.3

Table 4.6. Hatunmarca Architectural Surface Sample Data

Stratum	Surface collection	Floor area (sq m)	Mean srfcol area	Mean stratum area
A	901	23.8	23.8	10.7
A	902	7.5	9.7	
		11.9		
A	904	8.0	9.3	
		6.6		
		8.0		
		8.6		
		9.6		
		12.6		
		12.6		
		8.0		
B	921	15.3	16.6	17.3
		13.2		
		21.2		
B	932	17.3	18.5	
		19.6		
C	907	9.6	9.6	12.6
C	908	10.8	13.3	
		13.9		
		11.3		
		17.3		
C	910	12.6	12.6	
D	911	110.6	71.8	22.0
		33.0		

Stratum	Surface collection	Floor area (sq m)	Mean srfcol area	Mean stratum area
D	912	14.7	15.9	
		9.1		
		32.0		
		7.7		
D	925	11.6	16.7	
		21.7		
D	926	10.4	11.3	
		11.9		
		7.3		
		18.1		
		8.6		
D	927	11.0	11.0	
E	913	11.6	13.0	11.8
		13.2		
		14.1		
E	928	5.7	10.1	
		14.4		
F	915	13.5	13.5	14.9
F	916	22.1	15.0	
		7.9		
F	917	12.6	12.6	

Stratum	Surface collection	Floor area (sq m)	Mean srfcol area	Mean stratum area
F	918	18.1	15.3	
		18.9		
		13.9		
		17.1		
		19.6		
		8.2		
		15.2		
		11.3		
		24.6		
		6.2		
F	930	13.9	13.9	
G	938	13.2	13.2	17.5
G	939	17.3		
		32.2	20.3	
		17.3		
		14.5		
G	941	15.5		
		9.1	15.9	
		20.4		
		18.4		
H	932	11.9	11.9	13.8
H	933	19.6	18.0	
		28.3		
		6.2		

Stratum	Surface collection	Floor area (sq m)	Mean srfcol area	Mean stratum area
H	934	20.4	14.8	
		11.9		
		18.1		
		18.1		
		7.1		
		17.3		
		23.8		
		8.5		
		8.0		
H	935	9.1	9.1	
H	948	8.6	8.6	
		11.0		
		6.2		
I	949	16.6	12.1	11.2
		10.5		
		10.0		
		11.3		
I	950	22.1	10.7	
		11.6		
		7.7		
		5.7		
		8.6		
		4.9		
		18.1		
		7.1		

Stratum	Surface collection	Floor area (sq m)	Mean srfcol area	Mean stratum area
J	953	11.3	12.5	12.5
		13.2		
		10.0		
		13.9		
		13.2		
		15.2		
		16.6		
		6.2		
J	954	11.1	13.2	
		15.2		
J	955	16.6	11.8	
		10.4		
		13.2		
		10.8		
J	956	13.5	13.4	
		13.2		
		8.2		

Stratum	Surface collection	Floor area (sq m)	Mean srfcol area	Mean stratum area
K	942	14.5	12.4	13.1
		7.3		
		11.3		
		10.2		
		12.6		
		11.3		
		21.2		
		10.8		
K	943	11.9	12.5	
		15.9		
		14.1		
		11.6		
		10.2		
		11.0		
K	944	7.5	14.4	
		12.6		
		18.1		
		12.8		
		15.9		
		11.9		
		23.8		
		6.5		
		20.4		
K	945	13.9	13.9	
K	946	13.9	11.6	
		9.3		

Chapter 5

Ethnoarchaeology and Contemporary Domestic Economy in the Mantaro Valley

Lynn Sikkink

In studying social organization and economic strategies in the Andes, a consideration of the household and domestic economy is fundamental. Ethnographers, ethnohistorians, and archaeologists alike rely on the household as a means of organizing information and as a unit through which unique Andean patterns can be understood. This volume of contributions from UMARP research stems directly from such an approach not only to understand the household and household economics but also as a way to explore political economy from the ground up (Chapter 1). Because the household is used in these investigations, it is necessary to consider the nature of the contemporary Andean household and its appropriateness both as an analytical unit and as an analog for archaeological evidence. Beginning with an ethnoarchaeological example that illustrates the link between contemporary practices and the prehistoric household, I aim to explore the degree of continuity in domestic economy over time and to show how contemporary households can be used as models for prehistoric households.

ETHNOARCHAEOLOGICAL RESEARCH AND CONTEMPORARY HOUSEHOLDS

In its most basic form, ethnoarchaeology is ethnography undertaken by archaeologists to aid archaeological interpretations. Watson points out that "we cannot understand the past except via our knowledge of the present" a view formulated also by Yellen (1977) when he claims that the question to be asked is how best to study the present for clues to the past, not whether the present should be studied with this goal. The assumption that the present is the key to the past has certainly been roundly criticized in archaeological debate (Gould and Watson, 1982; Wobst, 1978; Wylie, 1985) but it continues to be the foundation of ethnoarchaeology. At the same time, researchers recognize that analogs must be chosen with care, and that not all aspects of past behavior are represented in the present (Kramer, 1979; Yellen, 1977). Although these assumptions serve as points of departure, the process of operationalizing the method of ethnoarchaeology in the field has produced a diverse and complex array of approaches. Some researchers, for instance, have used ethnoarchaeology

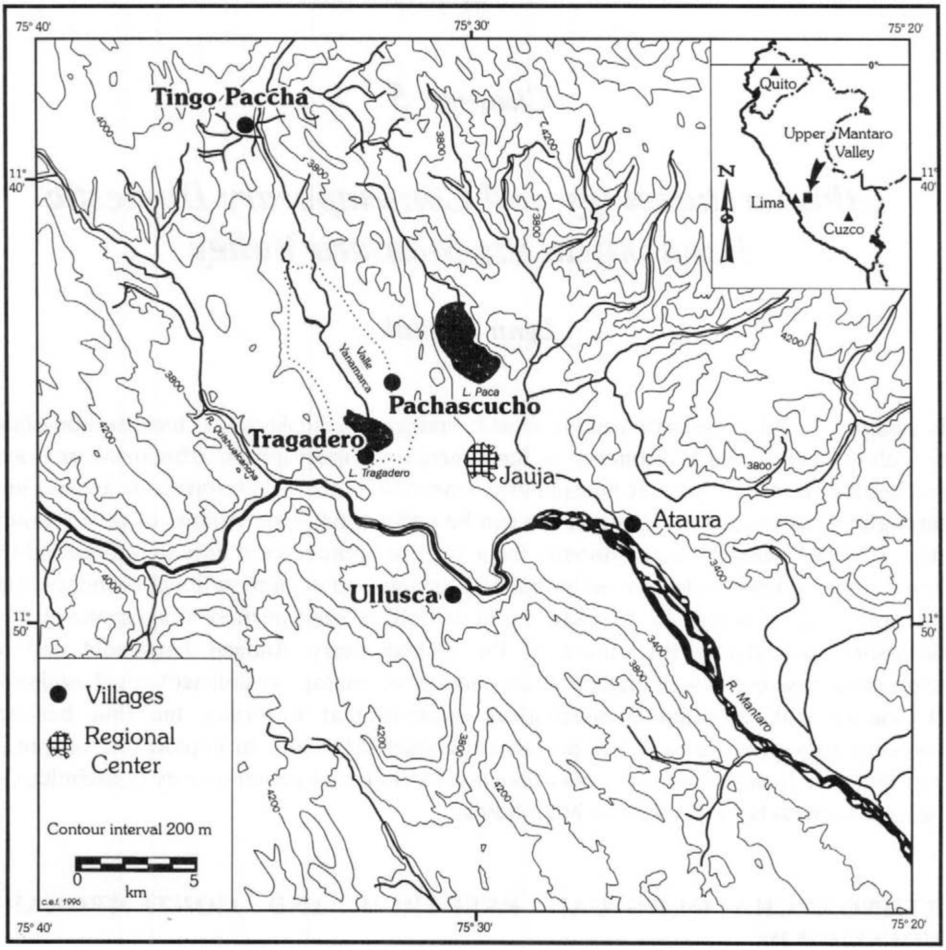

Figure 5.1. Location of villages in study area.

as a means to investigate modern site formation processes that might serve as models for archaeological sites (Gorecki, 1985, Yellen, 1977). Others focus on the use of space and activity areas (e.g., David, 1971, Hodder, 1986, Kent, 1984); still others have addressed the problem of assuming that certain activity areas are "male" and "female" on the basis of assumptions about the sexual division of labor (Conkey and Spector, 1984).

All of these studies provide useful models for ethnoarchaeology but few have specifically addressed how modern households use plants, and how the activities around plant use might be reflected in the depositional record. In order to understand these particular issues, I conducted an ethnoarchaeological study that involved ethnographic observations about plant use in modern households and the ethnobotanical collection of plant deposits. The sampling was done in an analogous fashion to paleoethnobotanical sampling on archaeological sites (Hastorf and Popper, 1988; Pearsall, 1989). In order to maintain

Table 5.1. Household Data

Village	Household	Elevation	Crops produced	Community orientation
Tingo Paccha	Villanes	3,700 m	Potatoes, barley, wheat, fava beans	1
Tragadero	Parco	3,475 m	*Quinoa, oca,* wheat, barley, fava beans, (potatoes and wheat lost due to flooding)	2
Pachascucho	Baltazar	3,525 m	Potatoes, wheat, *quinoa, tarhui*	3
Ullusca	León	3,375 m	Maize, wheat, barley, fava beans, some potatoes	4

focus in my observations, I concentrated on the activities surrounding harvest and processing of various crops. I selected four households from the Mantaro for intensive observation. Because different crops are emphasized in different parts ofthe valley, 1 selected sites from separate villages at varying elevations (see Figure 5.1 for locations ofthe households). Each household varies not only in environmental features and therefore produces a different set of crops (Table 5.1), but also in terms of household members: from one female-headed household to three households of couples with their extended families, and in one case a couple with their adult daughter and her baby girl. As outlined in Table 5.1, the Villanes household in Tingo Paccha , the highest in the valley, is quite traditional in relation to the others. Its composition is an extended family. The Parco household in Tragadero is headed by an older couple whose children reside elsewhere. The Baltazar household in Pachascucho is headed by a woman whose estranged husband lives elsewhere; she lives with her younger children, along with her grown son, his wife, and their children. The Leon household in Ullusca is the least traditional on this scale; Ullusca is located on the main road connecting Huancayo and Lima. The family is composed of an older couple, their adult daughter and her child, and two other children.

From these households, in 1986, I took soil samples that were processed with the flotation device used for UMARP paleoethnobotanical samples (see Chapter 7, this volume). The samples were also analyzed in analogous ways to other UMARP samples to provide data about plant remains from specific contexts. Although I made ethnographic observations in four households, only three households were sampled for plant remains. The information provides interesting data linking floral remains to specific activities in contemporary households as a way to model similar activities for prehistoric households. Of the 87 ethnobotanical samples that I gathered from the households, 81 were analyzed. These modern samples with good preservation were loaded with rich plant data. This "richness" was time-consuming in terms of sorting, identifying, and analyzing the data, but in order to get more fine-grained data and to analyze these contexts in greater depth it was necessary to have an even larger sample population.

Despite the limitations of this kind of sampling, the results are rewarding in that they provide concrete information about the relationship between observed activities and their physical remains deposited as plant remains. Data from contemporary ethnobotanical samples do not suffer from prehistoric samples' problem of interpretation, such as poor preservation and unknown cultural associations. They can therefore provide different information, which allows them to be used to fill in the missing evidence from paleoethnobotanical samples. Since there is no preservation problem, different plant parts (not just charred seeds) can also be analyzed, providing a multidimensional perspective to the interpretation of data.

One important implication of this project for archeological samples is the view we can gain about charred remains. This information demonstrates which taxa are charred, in which contexts they are found, and how their numbers compare to total (charred and uncharred) numbers of various taxa (Table 5.2). Charred remains are much more common in the household samples than in the field samples, and high percentages are found in hearths, *guano de corral* heaps (refuse/fertilizer piles), and certain kitchen contexts, with lower percentages scattered throughout the rest of the household. It is important to note the contexts that do *not* have charred remains. Examples include certain samples from patios, where high densities of plant remains and diversity of overall taxa present are not reflected in the charred remains. In some samples, no charred material was present, although perhaps over a longer occupation of the houses, more charred deposition would be built up. On this basis, it is possible to say that only a small percentage of the original floral material is charred, demonstrating again how paleoethnobotanical samples do not represent a full picture of the deposited botanical remains. Nevertheless, if interpreted carefully, using an array of samples, charred remains are indicative of the original deposition.

Variation among the households for botanical remains stems from a variety of factors. Some of the variation is likely due to environmental differences, such as the fact that the households are located at different altitudes within varied microenvironments and produce different crops. Other differences are attributable to variances in the range of household activities. An example of the first point is reflected in the *quinoa* distribution. In the León household, where *quinoa* is not grown, there is almost no evidence of it in the household deposits. Different housekeeping styles from household to household can be demonstrated by the Baltazar household, where overall density of remains was higher than at the other households due to its being "messier" and because food remains were found in many contexts, not just the kitchen. Crop handling is also reflected in the density of household remains. Evidence for variation among households is relevant to archaeological contexts because it serves as a cautionary note in interpreting archaeological remains: A particular household may have individual variation that is unrelated to others in its class. This kind of general information aids both paleoethnobotanical and archaeological interpretations by providing concrete data about the sorts and quantities of taxa found in household contexts.

ANDEAN DOMESTIC ECONOMY AND GENDER

In the ethnographic observations made for this project, along with more recent ethnographic fieldwork in the Bolivian Andes (Sikkink, 1994, 1997), it is clear that just as men and women are continually affected by the activities and the requirements of everyday life, gender shapes household economy. Because women manage the domestic economy in the contemporary Andes while men are sometimes absent during parts of the year (employed in wage labor), the issues of household economy must be considered alongside questions of gender relations and, in particular, the sexual division of labor. Households are important to discussions of gender and sexual division of labor because they organize a large part of women's domestic–reproductive labor. As a result, both the composition and the organization of households have a direct impact on women's lives and, in particular, their ability to gain access to resources, labor, and income (Moore, 1988:55).

Women and men may have competing interests within the household, as is true for other members. This is discussed in Chapter 1, when considering why households do not always pool their resources. Harmony, then, is not necessarily characteristic of households. Sometimes this aspect of domesticity is misrepresented by researchers because as "contemporary observers and official statistics often use fathers to represent their families (in assigning class and assessing standards of living, for example), the households are absorbed into their heads" (Ross, cited in Rapp *et al.,* 1979:187). Hartmann's study (1981) of the relationships embedded in modem Western housework shows that the division of labor in the household tends to benefit men. Her main conclusion is that contrary to the picture of harmonious domesticity, the household is the locus of struggle. She further suggests that women's status has declined as households are incorporated into national institutions and the market economy. One way to clarify these relationships within the household is by looking at economic strategies that men and women employ and making a conscious attempt to understand relationships between household members instead of simply using the term "household" uncritically to represent equally the members therein.

CONTEMPORARY STUDIES OF THE ANDEAN HOUSEHOLD AND DOMESTIC ECONOMY

Ethnographic studies of Andean households point to the importance of the household as a unit of study. Although researchers have certainly been critical of the way in which the household may have been misused in some studies and models, they continue to focus on it as a vital part of the Andean cultural landscape. In one study set in the Yanamarca Valley, Florencia Mallon (1986) investigated the transition to capitalism by looking at the role of the Central Andean peasantry and the household. Conceptualizing the household as a "particular historical construct," she asked what significance could be attributed to the continued existence of the peasant household. In her opinion, rural household production is linked to class formation and the urban sphere and now serves "exclusively to help reproduce a wage labor for agrarian and urban capital" (1986:148). Her position identifies an agrarian bourgeoisie and a rural proletariat that together represent the primary class

Taxon	% of total samples	% of Household Samples Parco (*N*= 12)	Baltazar (*N*= 24)	León (*N*= 14)	Charred taxa Count (No. samples)	% of *N*= 81
Ambrosia sp.	2	0	4	0	1	1
Amaranthus sp.	38	17	46	28	2	2
Anonaceae	1	0	0	0	0	0
Apiaceae	6	0	12	7	0	0
Asteraceae	54	58	67	36	5	6
Avena spp.	49	67	46	33	9	11
Brassicaceae	57	42	67	50	10	12
Bromus	54	50	58	71	2	2
Capsicum pubescens	11	8	21	14	0	0
Caryophyllacea	9	0	0	7	1	1
Chenopodium sp.	44	17	71	43	5	6
Chenopod/ Amaranth	5	0	12	0	2	2
Convulvus sp.	0	0	0	0	0	0
Cyperaceae	77	100	71	78	14	17
Fabaceae	43	25	58	64	7	9
Geraniaceae	12	0	12	0	0	0
Haba	20	17	33	21	2	2
Labitae	31	58	25	14	2	2
Linaceae	5	8	4	7	0	0
Maize *(Zea mays)*	4	0	8	7	1	1
Malvaceae	28	8	17	36	5	6
Medicago sp.	83	92	87	93	19	23
Melilotus sp.	10	17	12	14	1	1

(continued)

Table 5.2. *(continued)*

Taxon	% of total samples	% of Household Samples Parco (*N*= 12)	Baltazar (*N*= 24)	León (*N*= 14)	Charred taxa Count (No. samples)	% of *N*= 81
Olive	1	0	0	7	0	0
Orange	2	8	4	0	0	0
Oxalidaceae	7	0	12	0	0	0
Panicum sp.	18	17	17	14	1	1
Passiflora sp.	9	0	8	7	0	0
Pea	5	17	8	0	1	1
Small Poaceae	70	67	79	43	17	21
Large Poaceae	40	42	42	50	15	19
Polygonaceae	25	0	50	14	2	2
Prunus sp.	0	0	0	0	0	0
Quinoa sp.	40	42	79	7	13	16
Relbunium sp.	1	0	4	0	0	0
Rice	1	0	0	7	0	0
Rosaceae	1	0	4	0	0	0
Rumex	1	0	0	0	0	0
Scirpus	10	0	4	7	0	0
Seed A	36	25	71	29	2	2
Seed C	11	17	17	7	3	4
Seed D	6	0	8	0	0	0
Seed E	1	0	0	0	0	0
Seed G	2	0	0	0	0	0
Senecio sp.	48	25	83	21	5	6
Solanaceae	27	8	29	29	1	1

(continued)

Table 5.2. *(continued)*

Taxon	% of total samples	% of Household Samples Parco (N= 12)	Baltazar (N= 24)	Leon (N= 14)	Charred taxa Count (No. samples)	% of N= 81
Sonchus	58	75	58	29	6	7
Sunflower *(Helianthus)*	1	0	0	0	0	0
Sisyrinchium	1	0	0	0	1	1
Taraxacum	16	0	21	7	0	0
Tarhui	0	0	0	0	0	0
Tuber (unid.)	1	0	0	7	1	1
Verbena	17	8	21	14	2	2
Veronica persicum	35	17	37	57	10	12
Wheat/ Barley	41	42	62	64	11	14
Unidentified	6	75	75	50	14	17

conflict in the region. However, she emphasized the need to focus on both class and patriarchy in analyses of household production. In her argument, the "survival" of household production can be understood as a specific historical interaction between patriarchy (through which women's labor is controlled) and mode of production, which is related differently to Mallon's two classes. In this analysis, the debate revolves around an understanding of the continued existence of the rural household, but the household economy as a concept is very useful to her argument and line of reasoning. The household economy here is a useful model—a framework by which the data can be understood.

Attempting to explain new labor markets and flows, Jane Collins (1986) suggests that the present emphasis on the household as the basic unit of analysis in studies of Andean peasant economy is misguided. Collins suggests that the household as part of a broader kin network is being broken down and the nuclear family is emerging as a response to new capitalist pressures. Mallon sees the household's continued existence as promoted by capitalism because it provides necessary labor. In Collins's view the "household" that we perceive is influenced by our contemporary notions of capitalism. Nonetheless, her data presentation from southern Peru draws on the household as an analytical unit in familiar ways, but her cautionary note reminds us not to focus on the household to the exclusion of the larger social structure. She advises us to remember that the household today is in part "the product of a colonial administration that viewed the domestic unit of Western society as natural and universal and that sought an appropriately bounded unit of local administration" (1986:667). This conclusion, while focusing our attention on the colonial role in describing and forming institutions, neglects a consideration of the ways in which household relationships and practices have been maintained. The archaeological record testifies to the unique pre-Hispanic arrangement of these households, giving clues to the relationships contained therein. Beyond this, ethnohistorical documents indicate that tribute was drawn from communities comprised of individual households that together shared tribute responsibilities.

Sarah Skar's study (1985) draws our attention to ways in which the household is bound together with other cooperating households to form communities. Skar is primarily interested in describing how interhousehold co-operation is facilitated by multiple sibling–group marriage. The use of the terms "household" and "household economy" is much less problematic for her, and like Mallon and Collins, she draws on it as her analytical framework. However, unlike Mallon, Skar argues for the persistence of social forms as barriers to capitalism. This view is similar to the one presented by Harris (1983), who demonstrates that households and communities may block capitalist intrusion. Skar presents her material through the perspective of two economic sectors: the capitalist sector and the subsistence sector (maintained by the household). For her, it is the flexibility of the relationship between these two sectors that is crucial to village autonomy.

An important point emerging from these three examples of Andean household studies is that the household as a unit has broad applicability even to researchers with radically different viewpoints. The domestic economy is a fundamental springboard from which to understand social issues, from clarifying theoretical orientations to discussing gender relations and the interactions of different economic spheres. While researchers have provided insights into the problems of using "the household" in an unsophisticated way, its use is a valuable analytical tool in discussing relationships between individuals, households, and the place of the household in the social structure and its relationship to the wider economy.

DOMESTIC ECONOMY IN THE MANTARO VALLEY

In this discussion of the contemporary domestic economy of the Mantaro Valley, some generalization is necessary. Some reasons for variation are due to the settlement to which the household belongs and its particular history and development. These settlements, in turn, differ by size, elevation, age, and degree of integration into the market economy. Labeling some communities "traditional" does not mean that they are necessarily organized as pre-Hispanic communities were, but simply that their structures are older in origin and they share affinities with some pre-Hispanic settlements. So-called modern pueblos are more recent in origin and in general are like small towns in which community cooperation and communal government are less important than in traditional communities. One broad difference between a *comunidad campesina* and a *pueblo* is that communal governance and sharing of activities in the former provide a formal suprahousehold organization to which individual households belong and can turn for a variety of needs. While members are required to contribute labor and sometimes material goods (e.g., by feeding a work party), they also receive the benefits of community production. While pueblo inhabitants may cooperate, it is not on a community-mandated level; therefore, households in towns tend to be more autonomous and are characterized by ownership of more private land and the use of noncommunal labor practices.

In general, the spatial organization of modem towns is on a grid pattern around a central plaza (Hispanic), while in more traditional (and often smaller) communities, the spatial arrangement of households is a more dispersed pattern, not necessarily ordered on a grid. Towns are well-represented in the lower elevations of the Mantaro Valley, where interference with former patterns has been greater; a higher degree of communal control, and therefore more evidence of traditional organization, is characteristic of communities at higher elevations in the Mantaro Valley (Mayer, 1979:56).

Hundreds of traditional agricultural communities in the Mantaro Valley today are evidence for the viability and vitality of subsistence agriculture. However, these communities have adapted and modified themselves over the long course of Andean history. The Spanish-decreed *reducciones* (resettlement into nucleated, taxable communities) that began in 1570 forced the population to settle in the lower zones of the Mantaro Valley and to discontinue the older pattern of population distribution throughout the various life zones at different elevations (Mayer, 1979:57). After the *reducciones,* farmers retained control over lands at different elevations through a system of apportioning to different communities horizontal strips of land that included "low" lands beginning at the river and moving up to the highest *puna* lands above the river valley. The foundation of new settlements, along with population increase and the much-later results of agrarian reform, eventually led again to differentiated communities dispersed across the landscape (Mayer, 1979).

It is worth noting the changing settlement pattern because of its effects on household economics. As communities became more autonomous and differentiated, individual households became more dependent on external means of obtaining the full complement of subsistence goods. Herding communities are strongly linked to agricultural communities at lower elevations, and to the market, to supply their needs for items such as maize, *quinoa,* and manufactured goods; agricultural communities tend to participate in the market economy to earn cash for goods, including fertilizer, salt, oil, and sugar; the urban communities depend on nonfarming sources of income such as handicrafts, transportation, commercial shops, and services. Thus, production has become modified and specialized at the household and hamlet level, but there is still a great emphasis on both agriculture and the household as a unit of production, whatever that production may entail.

Compared to other Andean regions, the economy of the central highland region has had commercialized aspects from an early date (Mallon, 1986). Because of strong agricultural and mining sectors, as well as good transportation routes, segments of the population have been integrated into the market economy since Colonial times. At the same time, marked identity with regional ethnic groups and the persistence of the subsistence agriculture strategy has maintained a traditional domestic economy. These influences have created a "strongly commercialized but still precapitalist economy" (Mallon, 1986:151). In the Mantaro Valley today, many households practice subsistence agriculture in which most of their production is for consumption (crops are stored from one harvest to the next for food and seed) even while they may buy and sell in the local or regional marketplaces. These economies are interdependent. For example, the capitalist economy depends on peasants being able to work at low pay by provisioning themselves in a subsistence economy.

Today peasant households in the Mantaro Valley have varying forms and compositions but are usually based on a family group with at least one parent and children. Ideally, a household production unit comes into existence after a marriage and continues to grow as the young couple has children who then become productive. The household disintegrates upon the death or retirement ofthe original couple. In general, households are either nuclear families of various sizes or small extended families (Sikkink, 1988). Households are also characterized by a certain degree of fluidity, as when an estranged husband sets up a household in a different area and the children move back and forth between the mother's and father's households. In addition, adult members from related nonagricultural households

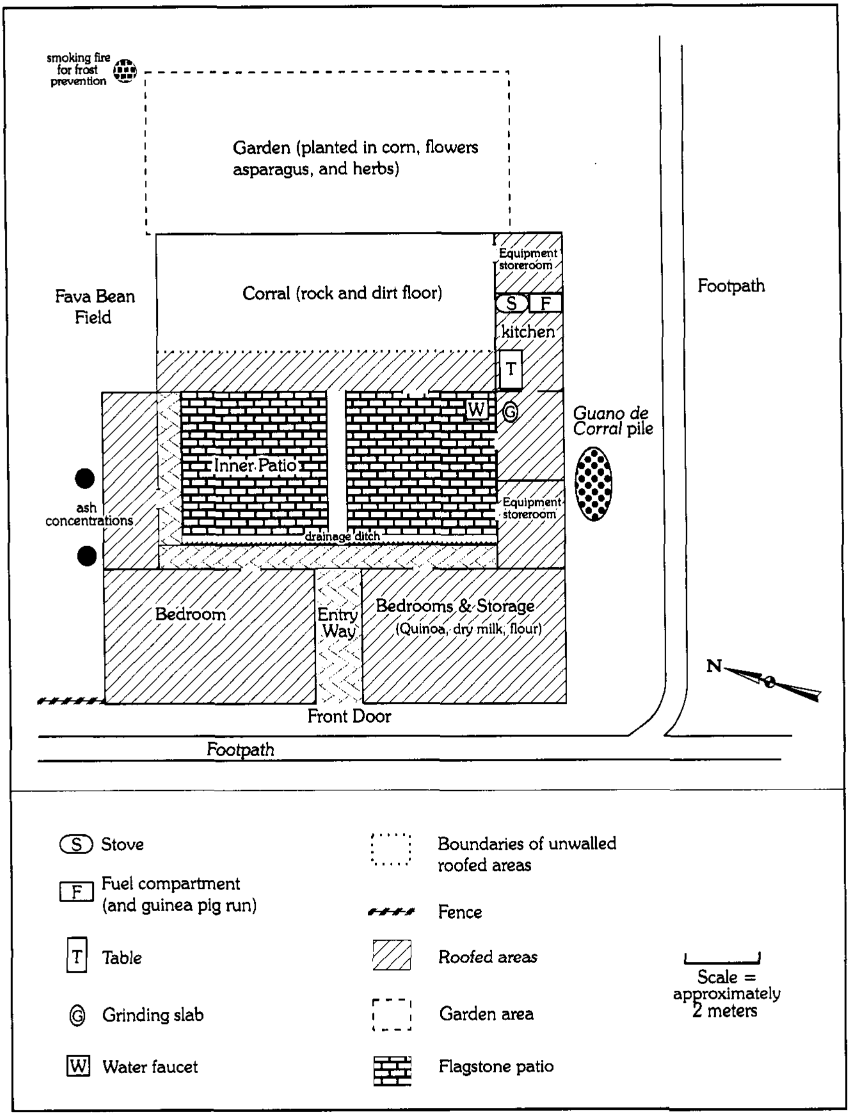

Figure 5.2. Sketch map of the Parco household in Tragadero.

may be called upon to live and work in the agricultural household during busy times of the year, such as at harvest.

The configuration of the modern house in the Mantaro Valley area shares some similarities with the prehistoric arrangement of structures and patio areas even though their shapes differ. As seen in Figure 5.2, the modern house is rectangular in overall plan and comprised of a series of rooms or roofed areas around a central open patio. In modem households the kitchen, bedrooms, and storerooms are generally roofed areas, and the patio is used for a variety of activities, including crop processing, food preparation, repair, sewing, and tending animals. In the prehistoric compounds, circular stone structures are enclosed by a large patio wall to form separate units. The overall plan of each of these individual compounds is an irregularly shaped circle (see Figure 6.3). Therefore, despite the difference in structure shape, the modern and prehistoric households are arranged similarly, facilitating similar relationships.

The peasant farming schedule is demanding, and the household is therefore characterized by a division of labor in which different members contribute their labor in distinct ways. As for household composition, patterns are flexible but clearly do exist, and some tasks seem to be regarded as women's work even as both men and women perform them. In general terms, "the woman's express task is to keep the household running" while "the man works in the fields and transports produce from field to storeroom" (Allen, 1988:73). In practice, men and women perform overlapping tasks; the division of labor is not rigid. In the Mantaro Valley of the 1980s, many tasks were not sex-specific and there was much overlap in daily work. During harvest in the Mantaro Valley, many of the steps in crop-processing are performed by both men and women, the goal being to complete tasks efficiently during this busy period (Sikkink, 1988).

The basic structure for the division of labor is probably pre-Hispanic in origin. In the pre-Hispanic Andes, the organization of work turned around a division of labor based on age and gender. Andean noms defined certain tasks as appropriate to men and others to women. But in any case, the division of labor was never so strict as to prohibit one sex from doing the other's task if the need arose (Silverblatt, 1987:9). Men tended to do more heavy work than women, although agricultural tasks were shared. In contemporary practice, men drive the oxen-powered plow in the modern Andes or use the pre-Hispanic *chaquitaclla* (foot-plow), as did their ancestors. During the planting tasks, women were often the sowers. While men were most strongly associated with plowing and warfare (Silverblatt, 1987), women had a host of agricultural tasks that they carried out independently or alongside males, including preparing fields for cultivation, planting seeds, harvesting, weeding, hoeing, and herding. Besides these field activities, they were also busy with cooking, brewing *chicha,* child rearing, and carrying water. Peasant women still perform many of these tasks today.

With the growth of wage labor, with men increasingly involved outside of the house, female household members have more responsibilities in the house, especially during certain times of the year. (Parenthetically, we may note that wage labor is a colonial development but under the lnka empire men were often drawn away from their households by tribute obligations imposed by the Inka state.) Because of this, household labor at times may be insufficient, and these households rely on various forms of interhousehold cooperation that supplement an individual household's production. For instance, female heads of household may depend on the cooperation of relatives (such as brothers) from other households by exchanging their own labor, thereby assuring help during harvest season and other busy periods (Sikkink, 1994).

The agricultural calendar is complex and varied, and agricultural activities vary by month and elevation. For instance, although potatoes are harvested in May at midelevations, they are harvested later at higher elevations. Mitchell (1980) describes the complexity of agricultural cycles in Quinua, arguing that idealized models of labor obligations to the Inka state could not have worked in practice. Given this complexity, a standardized agricultural calendar cannot be described for the Mantaro Valley but a general description of the agricultural cycle may be helpful in understanding the operation of the domestic economy. The main yearly divisions in the agricultural calendar are the rainy season and dry season cycles. The harvest corresponds to the dry season, and late rains can delay or even damage the harvest of certain crops, such as potatoes. Within this cycle, planting and harvesting crops are interwoven in distinct patterns, depending on the community, the household, and even the individual farmer, as a way to ensure the highest possible production. Planting opens the agricultural cycle and is therefore a moment of risk and opportunity.

Planting strategies in higher- and lower-lying fields for different crops are the result of complex and finely tuned task calculations. One of the reasons for this complexity is the desire to spread risks in an unpredictable environment (Mayer, 1979:72). Fields prepared by turning the soil and "softening" the earth will be planted, beginning in September, although sometimes potatoes are planted much earlier and remain dormant until the rains begin. Plowing in the Mantaro Valley is usually done with an ox and plow except where the terrain is too steep. In this case, hand tools are often used to "open" the earth. Only in the highest fields or in more isolated communities is the ancient foot plow *(chacquitaclla)* still used. As the crops grow and mature, they must be tended regularly. For example, household members visit their fields to ascertain that other households' animals are not grazing there. This constant vigil must be maintained until harvest because there are no fences, and fields are widely separated and often far from home. Also, the plants themselves are tended by weeding, hoeing, sometimes adding pesticides and herbicides, and in the case of potatoes, mounding the earth around the young plants.

Harvest begins when the crops are mature and "dry" in the fields. Harvest time is a labor-intensive and exhausting time of the year for farmers. There is also a sense of urgency to get the crops out of the fields quickly, since they are especially vulnerable to crop theft at this time. Therefore, households pull together to work efficiently and rally support from kin or neighbors through either cooperative labor exchange or by paying for labor (usually by paying the laborers a portion of the harvest). In the Mantaro Valley, one of the first crops to be harvested is potatoes. They are also the most labor-intensive crop, first because they must be dug up, and second because they are heavy and hence difficult to transport. As in planting, when the potato furrows are opened by oxen, it is the men who guide the plow, although both men and women will be involved in the back-breaking work of gathering the potatoes. Potatoes are also sorted into classes before they leave the field, a time-consuming task usually done by women. By contrast, maize is cut and left to dry in the fields, then transported to the house, where the kernels are removed from the dry cobs or, in some instances, the whole cobs are braided by their husks for storage. In all of the harvest activities except for the plowing, noted earlier, men and women cooperate interchangeably and very often use the same tools and methods. This said, certain tasks, such as winnowing, are more often done by women. This may be because a good winnowing is a first step in the cooking process, and women may actually winnow several times to remove the chaff and other seeds from a crop that they are readying for meals.

Coupling uncontrollable factors such as the weather (late rains or early frosts) and the possibility of crop theft, Andean agriculture is a risky venture. This is one of the reasons farmers hold parcels of lands in widely separated locations, minimizing the risk of losing everything at once. Because communities consist of households that own land in different areas (and, therefore, microclimates), and these pieces of land are arranged into different total packages of land, each household has differing schedules and cycles. As Brush points out for the community in which he worked, "Individual households follow their own particular regimes. No one household . . . produces every crop in every part of the valley" (Brush, 1977:101).

Despite the differences among traditional peasant households in their composition, the kind of community to which they belong, and their scheduling of agricultural activities, contemporary households are similar to their prehistoric counterparts in that they are not autonomous units operating entirely on their own labor power and resources. In more traditional communities, where communal decisions determine fallow cycles and use of communal lands, the suprahousehold organization is the community, either the *ayllu* divisions or the wider ethnic group. Although this structure is absent in more modern village settings, households cooperate with each other to ensure that labor will be available when needed *(ayni).* Although it is not governed from above, interhousehold cooperation is maintained as a necessary part of individual household economics. Therefore, when we speak of the household as the fundamental productive unit in the Andes and discuss household economics, it is necessary to remember the interhousehold economic ties that link these productive units and guarantee their existence. Indeed, households are fundamental productive units only insofar as other households exist and continue to be productive themselves. While this system today depends on the input of cash that household members (particularly men) seek in the wage labor sector, it equally depends on the availability of labor reciprocity. It is within this domain that social and political processes can be manipulated to the advantage of some, such as we occasionally see in the archaeological record.

SUMMARY

Using data from an ethnoarchaeological study of plant use, ethnographic observation, and a review of modern household studies from the Andes, I have outlined some of the features of the household and domestic economy in the Mantaro Valley today in order to claim that it is realistic to assume some continuity between the patterns of pre-Hispanic households and modern ones. At the same time, we cannot adopt, wholesale, the contemporary household as a model for its prehistoric counterpart. Our notions of the household and the relationship among its members require critical assessment. We must approach the concept of the "household" cautiously while examining the degree of fit.

There are a variety of ways in which the contemporary household provides a good model for prehistoric ones, I believe it is safe to use the physical arrangement of the household from modern times as a model for pre-Hispanic households, even though the shapes ofthe patios, structures, and their contents differ somewhat; that is, many ofthe same activities (such as crop processing) took place in prehistoric households in an analogous manner to what we observe in modern households, and we can firmly link some of the spatial dimensions ofthese activities. Therefore, many activity areas can be interpreted from archaeological remains using ethnographic analogy. I also believe we can describe prehistoric households as productive units—archaeological remains attest to this—but we must critically explore the links among households, since it is obvious from contemporary studies that interhousehold cooperation is key to maintaining each household's well-being. Household composition was probably similar in pre-Hispanic times also, but there was always variation throughout the life cycle of any one household. Household variation is a common thread through time. We can also discern shared activities in these household arrangements, but beyond that, we must be careful not to assume that households were harmonious; neither were they characterized by income pooling and cooperation. Household members most likely worked together but, undoubtedly, power relations and gender distinctions operated both within and outside the household. Given this, households cannot necessarily be contrasted to the political economy "beyond" their walls. The articulation of the pre-Hispanic Mantaro Valley household with the wider economy is a question that can be tackled by carefully analyzing the archaeological record for signs ofhierarchy, ethnicity, gender, and class.

Along with continuities, there are also cultural patterns in present-day households that demonstrate discontinuity with the past (e.g., mechanization, processed foods, changing technologies); therefore, I do not claim that contemporary households serve as exact analogs to prehistoric ones. While I seejustification in using ethnographic analogies for composition and activities within the household, I am less inclined to draw parallels among the organization ofthe labor force as reflected in the household, division of labor (by both sex and age), and the scheduling of activities. These aspects of household economy are quite flexible and therefore variable as well. They are also less tied to the material remains of households. For instance, although sexual division oflabor probably became more open and flexible than in pre-Hispanic times, it is difficult to specify the material dimensions of this division, although ethnohistoric documents may provide some evidence. Nonetheless, and despite some discontinuities between past and present, the data from ethnographic sources are useful and serve as important sources of information. Their integration into archaeological interpretations will provide a richer and closer picture of how people lived and worked in the pre-Hispanic Mantaro Valley.

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Part II

Life in the Community

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Chapter 6

The Architecture and Organization of Xauxa Settlements

Elizabeth DeMarrais

Documenting architectural differences among Xauxa settlements through time provides a means of tracing the transformation of the society following its conquest by the Inka. This chapter presents an analysis of Xauxa architecture, with the goals of defining the domestic group, locating it within the larger settlement, and documenting its variability.[1] Its additional aims are to investigate the relationship between built forms and activities, and to consider how architecture serves to communicate information. In the Upper Mantaro Valley today, many of the masonry structures that made up Xauxa communities remain standing or at least partially intact. As they did in the past, their forms, as well as the structure of the settlements, convey information and reflect the daily lives and social organization of their inhabitants.

This study examines architectural variations in the Wanka II settlement hierarchies and then the changes in these patterns during Wanka III, the period of Inka rule. It considers how individual households articulated with the broader community and the regional hierarchy, and, in Wanka III, with the institutions of the Inka state. It then considers whether the designs of buildings had symbolic significance and how they might have expressed claims to status, wealth, or political position. Finally, it examines change in settlement organization to understand how Inka rule affected the distribution and use of public space.

Studies of the built environment recognize a range of factors—material, cultural, symbolic, and psychological—that influence its design and organization (Lawrence and Low, 1990). Explanations for variation in built environments throughout the world stress these variables to different degrees. Environment–behavior research, especially the work of Rapoport (1969, 1982, 1988, 1990), has focused attention on built environments as "expressions of ideal environments reflecting different world views and ways of life" (Rapoport, 1969:49). This approach focuses attention on built environments as culturally ordered settings used for a range of human activities. The built environment therefore has

[1] I wish to thank Jim Hill, Christine Hastorf, Coreen Chiswell, Lisa LeCount, Glenn Russell, and John Steinberg, who provided criticisms and helpful suggestions during the preparation of this chapter. I am especially grateful to Terry D'Altroy, who helped me to clarify my thinking and reorganize the chapter, and to Timothy Earle, for his consistent support of this research and his thoughtful comments on previous drafts. Catherine Scott's systematic notes greatly aided this analysis. Figures 6.3 and 6.18 were drawn by Robert Keller. An earlier version of this chapter was submitted in partial fulfillment of the requirements for the degree of Master of Arts in Anthropology at the University of California, Los Angeles.

both communicative aspects, or meanings that influence behavior and world view (Low, 1988; Rapoport, 1988), and instrumental aspects, as culturally ordered settings that facilitate human activities (Rapoport, 1982; 1990).

The sections that follow consider three aspects of architecture and the uses of space that are visible in archaeological remains: *levels of organization,* or social groupings, *evidence for planning,* and *face-to-face interactions.* Each is discussed in turn to illustrate how investigating the reflexive relationship between buildings and activities can inform us about social and economic organization.

LEVELS OF ORGANIZATION

A basic objective of archaeological research is to understand the spatial patterning of activities. The uses of space influence, to some degree, the forms of buildings and other activity areas, so that culturally constituted spaces comprise a part of the "material component ofcommunity behaviour" (Fletcher, 1978:237). Recognizing these relationships, archaeologists have established certain minimal space requirements for activities based on the number ofparticipants and the nature ofthe activity (McGuire and Schiffer, 1983). The constraints imposed by technology, environment, and the energetics of construction (Erasmus, 1965; Arnold and Ford, 1980; Abrams, 1989) also affect the range ofbuilt forms that is possible. Other researchers have related the diversity oftasks being performed or the complexity of social organization to greater differentiation in floor plans and architecture (Hunter-Anderson, 1977; Watson, 1978; Gilman, 1987). As ageneral rule, the intended uses of space contribute to, but do not determine, built form.

Approaching built forms as settings also focuses attention on the social principles by which a group assigns roles, allocates space, and coordinates activities (Rapoport, 1990). Kent (1984) has argued that the partitioning of space increases with social segmentation (or complexity) of a particular group. This relationship, she argues, appears to be valid cross-culturally, which suggests that researchers should consider social organization in conjunction with cultural and historical influences on the built environment. Thus, to the degree that household and *ayllu* structure, as well as status or wealth differences, influenced the ways activities were carried out at Xauxa settlements, we can begin to relate activities to their settings to infer some aspects of social structure.

Recent approaches in anthropology have emphasized the domestic unit as "essentially an activity group ... [that is] not necessarily a corporate social unit bound together by kinship or other social ties" (Wilk and Ashmore, 1988:3; see also Netting, Wilk, and Arnould, 1984; Wilk, 1989b; Johnson and Earle, 1987; Santley and Hirth, 1993; Introduction, this volume). This view of the household recognizes that the range of subsistence activities taking place within and around a dwelling influences its layout. As households become embedded in broader networks of reciprocity, production, or exchange, these tasks may increase in number or intensity, leading to more complex floor plans (Hunter-Anderson, 1977) or simply to more crowding within existing spaces.

At the same time, when households are the basic economic units, as they were in Xauxa society, dwellings are often discrete structures with areas for sleeping, cooking, and other subsistence activities. Broader social groupings, such as the kin-based *ayllu,* and other social segments, as well as institutions of hierarchy and economy, will be most easily recognized to the degree that they were tied to specific activities or settings (such as neighborhoods, plazas, workshops, or storage areas), or to other distinguishing features (e.g., large, elaborate houses within an elite residential district). Given the scale of Xauxa settlements and the evidence for settlement hierarchy, it seemed reasonable to expect differentiation of elite from commoner residences as well as evidence for civic or ceremonial activities in the form of public architecture or plazas.

Hillier and Hanson (1984:2), in a related approach, argue that "the ordering of space in [and among] buildings is really about the ordering of relations between people." Here, the emphasis shifts from behavior to the "social logic" of space. Social principles influence the placement of boundaries within a community, affecting access patterns, floor plans, and the nature of open or public space. These authors investigate social structure through analytical techniques that represent the structure of settlement layouts and building floor plans, and evaluate access patterns. Because these techniques are designed for use with site and floor plans, they are especially suited for archaeological studies. In a later section, I describe and compare several Xauxa communities using this approach.

In a similar vein, regional analysis in geography and archaeology has identified factors that may alter the nature and scale of integration *among* settlements. As societies become more complex, the notion of *functional size* takes on greater significance (Haggett, Cliff, and Frey, 1977; Johnson, 1977). This concept concerns the range of activities pursued at any given settlement within a regional hierarchy. Prior research has shown that Inka rule centralized indigenous political organization and that the installation of imperial facilities made the regional settlement hierarchy more complex (D'Altroy, 1987; Chapter 4, this volume). The Inka established a new paramount center (Hatun Xauxa), while the largest of the Xauxa settlements became markedly smaller under Inka rule. This change in scale may have affected the range of activities and architectural forms within subject communities. Depending upon the nature and location of new activities related to Inka rule, the functional size of previous Xauxa centers, such as Hatunmarca, would either have increased (due to increasingly diverse obligations to the state) or diminished (because of the loss of its paramount status). This study considers primarily household activities in largely residential settlements and is not a study of settlement patterns. At the same time, the character of regional relationships and, in this case, the imposition of imperial rule, inescapably affected activities within Xauxa communities, as the analysis will show.

A related issue concerns regional integration and the spatial distribution of elite activities. As Smith (1976) has argued, polyadic, dendritic, or central-place exchange practices will likely result in differing patterns of elite residence and actions. As shown by other authors in this volume, the new imperial political economy changed the nature and scale of regional exchange at the elite level but had little effect on low-level exchanges (especially Earle, Chapter 12). Skinner (1977) has additionally shown that, in complex settlement systems, the most efficient spatial organizations of political and economic activities may not coincide well. In imperial society, this may lead to physical separation of administrative and economic tasks that are integrated only at the uppermost levels of the system.

In the Upper Mantaro, the highest levels of decision making and power were removed from the hands of local elites and shifted conceptually and physically to Hatun Xauxa, the imperial center. During this period, tangible and symbolic sources of power derived from the Inka, not from indigenous society. Local elites were transformed from the highest-status individuals in their own society into state functionaries that acted as intermediaries between their people and the Inka. These changes in public and private activities, and in the material representations of status, were expected to have produced changes in both domestic architecture and public sectors of local communities. Subsequent sections of this chapter assess these transformations and the degree to which they were focused on the domestic or public spheres.

PLANNING

Often a clear relationship exists between planning and the intended uses of a building, district, or settlement. However, a planned layout also carries meaning, informing observers about the builders, their capacities, and their objectives. In traditional societies, where construction tasks are often shared by families, house form often follows a design or "mental template"(Deetz, 1967:45; Fletcher, 1978:234), which represents practical knowledge about what has worked in the past as well as cultural ideas about house form. More broadly, the arrangements of houses with respect to one another reflect shared conceptions of social boundaries and privacy.

At the level of the settlement, planning is a means to anticipate the space needs of the community as a whole, allocating space to "public" sectors and a path or street system that allows movement among individual buildings. With the increasing complexity of larger settlements, planning can establish a regular layout, such as an orthogonal grid, to create predictable patterns that facilitate navigation and movement by visitors. Similarly, major routes traversing a settlement with few curves help individuals orient themselves, while open spaces or plazas provide lines of sight that draw people toward public sectors by increasing their visibility from a distance.

Because planning affects the uses of space, it also offers the possibility for social control. Walls and other boundaries can impede or control flows of people. Physical barriers and the placement of entrances affect access patterns, although ritual or social proscriptions sometimes accomplish this goal just as effectively. At the same time, the locations and scales of buildings affect their communicative potential, so that effective manipulation of sight lines and other elements of the landscape increase their effectiveness as symbols (Higuchi, 1983; Moore, 1996). Thus, planning can reflect conscious efforts to manipulate the built environment, both to control activities and to influence their impact as symbols.

Ordered layouts and their instrumental effects vary with the composition and scale of social groups. Rapoport (1990:17), discussing behavioral cues, notes that increases in group size, scale, heterogeneity, or complexity mean that *"more* cues as well as *stronger* cues are needed to communicate effectively; in a word, *higher redundancy* is needed" (emphasis in original). This situation implies that ordering the physical world according to a culturally meaningful plan is increasingly important as social scales increase. This is also the case with portable elements of material culture; as the scale of social interactions increases, stylistic behavior is generally expanded to facilitate the exchange of information (Wobst, 1977).

Therefore, planning, and the objectives of those who undertake it, has consequences for the uses of space. Imposing a plan communicates the *capacity* (Mann, 1986; Wilson, 1988) of those in power to exercise authority, coordinate labor, and carry out the project. When the scale of those activities encompasses a settlement or monumental landscape, planning becomes an expression of the organizational power of a dominant group. Essentially, "planned cities reflect the heavy hand of powerful institutions who use planning as a signal of their ability to carry out major projects, to convert disorder to order on a large scale, and to force individual conformance" (Blanton, 1989:414).

Through the execution of a plan, those in power institutionalize and formalize social inequality and hierarchical relationships, reproducing these "social facts" in labor inputs and material expenditures that can be difficult to contest publicly. Monuments and central places represent elite oversight and control of daily life, and their enduring quality legitimates this social order. In this sense, the goal of restructuring the landscape is to ensure that "spatial organization reinforces culture by seeming to be naturally determined, rather than socially produced" (Pader, 1988:265).

The Inkas effectively used repetitive designs and planning as a means to express their hegemony. Inka settlements from Ecuador to Argentina, including those of the Upper Mantaro region, consistently contain rectilinear structures that were aggregated to form compounds. The buildings were often constructed with gabled roofs and trapezoidal wall niches, among other distinctive architectural traits (Gasparini and Margolies, 1980; Hyslop, 1990). Even more important for Inka control were the plazas in the sites, which functioned redundantly throughout the empire as settings for feasts hosted by the state as payment to corvée laborers. In the plazas, which could be overwhelming in their proportions, the central platform (often called an *usnu* today) symbolically represented the emperor in all festivities. Furthermore, the elaborate road system that connected Inka centers expressed efficiency, a symbol of the state's capacity to appropriate new territories (Hyslop, 1984). Architecture may have been particularly effective as a symbolic medium because the Inka did not share a common language with many of the ethnic groups they conquered (DeMarrais, Castillo, and Earle, 1996).

In examining the Xauxa sites, I expected that planning would provide a measure of political centralization for the Wanka II sites. The degree to which sites were planned, and their public sectors elaborated, should have corresponded to increasing political differentiation. For Wanka III, I expected that to the degree that the Inka exerted an influence on activities within local communities, these sites would exhibit more systematic planning and, probably, incorporate Inka architectural canons. At the same time, I anticipated that the degree to which Inka canons appeared at local sites would reflect the intensity of Inka intervention in the activities taking place within local communities.

FACE-TO-FACE INTERACTIONS

Face-to-face interactions refer to the encounters between individuals (Chang, 1958) or to the encounters of individuals with features of the built environment. Because built forms influence behavior according to cultural notions of privacy and social boundaries, they affect the frequency and nature of interactions. In this sense, "architecture determines to a substantial extent the degree to which we become automatically aware of others" (Hillier and Hanson, 1984:24). That principle suggests that the placement, scale, and accessibility of buildings affects the potential for communication through architecture, and also that the meanings expressed in residential structures will differ from those of the public sector.

This section considers how architecture and the built environment communicate information and address the problem of reconstructing meanings in archaeological contexts. Ethnographic studies have demonstrated the richness of symbolic meanings expressed in and mediated through houses (Bourdieu, 1973; Cunningham, 1973; Donley, 1982). These meanings shape social and ethnic identities (Humphrey, 1974; Okely, 1983) as well as gender relations (Moore, 1986; Hastorf, 1991) that are reproduced and negotiated at the household level. Other studies have shown how settlements and landscapes can map cosmologies or world views (Zuidema, 1964, 1983; Fritz, 1978; Ashmore, 1991; Espinoza Soriano, 1987). Recent theoretical work has drawn attention to practice (Bourdieu, 1977) and structuration (Giddens, 1979, 1981) as active processes through which people, in their routinized actions, generate and reproduce the rules and social codes that give meaning to behavior. Through practice, meanings are transformed, negotiated, or perpetuated. Built environments, as the settings for human activities, play an essential role in the generation of meaning and enculturation (Pader, 1988). At the same time, however, individuals may use space and its meanings to resist and disrupt accepted routines and beliefs (Moore, 1986).

Communication through architecture can encompass distinct levels of meaning, identified by Rapoport (1988), that range from cues for behavior (e.g., cues that lead people to act differently in ritual settings than they do in their homes) to social messages (that convey information about status, wealth, or political position) to symbolic meanings (that reproduce cosmologies or worldviews). For archaeologists, inferring meaning at each level can be difficult, although behavioral cues are often more straightforward than social meanings, while symbolic meanings may be the most difficult to interpret. Blanton (1989:413–416) has suggested that considering *how* built forms (especially public architecture) conveyed information may provide clues about social contexts and meanings. Though we may not know *what* the meanings were, he argues, the formal characteristics of architecture (e.g., the use of verticality, decorative features, or volume), their scale, and evidence for planning in settlements can suggest the types of communication they were designed to achieve. Furthermore, consistency (or variation) in patterning these elements, over time or throughout a region, may inform us about the social scale, organizational complexity, or regional integration of their builders.

The symbols themselves, as material culture, also reflect underlying economic decisions directed toward specific goals, especially when the messages concern claims about social status, wealth, or political affiliation (DeMarrais, Castillo, and Earle, 1996). As houses require substantial investments of resources and labor, household members must balance the costs of materials and labor with these social objectives (Wilk, 1990), which can lead to active negotiations of social structure through competitive displays of wealth or conspicuous consumption (Colloredo-Mansfeld, 1994). Netting (1982:657) argues that because wealth and household size are correlated cross-culturally, "the rich profit by a larger labor force and enhance their status and prestige by maintaining larger residential groups." Others observe substantial cross-cultural variation in this pattern (Douglas, 1973:519; Wilk, 1983:101), suggesting that additional evidence, such as the "visible quality" of a house, be considered as well (Wilk, 1983:113). Because house compounds were a conspicuous, enduring, and repetitive element of Xauxa material culture, I expected to find that the elaboration of patio groups corresponded to status or economic differences among households.

In public architecture, the meanings expressed by buildings and complexes tend to be "among the least subtle in their symbolic portrayal of cosmic and social structuring ... [with]

multiple and redundant messages signaling authority" (Ashmore, 1991:199). To the extent that these meanings are repetitive, easily interpreted, and ubiquitous, they are effective in generating compliance, intimidating a populace, or encouraging solidarity. The strategic character of this symbolic structuring of the public sector is clear when we consider the potential costs of alternative means to achieve these results (e.g., using physical force or rewarding supporters) (DeMarrais, Castillo, and Earle, 1996).

Archaeologists have recognized that with greater social inequality, material markers of status become increasingly important for communicating and perpetuating status differences (Cordy, 1981; McGuire, 1983; McGuire and Schiffer, 1983; Earle, 1987a). Although material culture in a wide range of forms can accomplish those objectives, visual displays through architecture, such as planned layouts, are especially effective for reaching large audiences, broadcasting their messages on an day-to-day basis. Visual displays typically involve labor, skills, or materials to which access can be restricted; if they can be copied or easily faked, they fail to mark their creators as those with privileged access to rare or valuable materials. Thus, many architectural displays involve substantial labor investment, and built forms that retain their meanings over time may prove to have been well worth the initial expense (Blanton, 1989).

In investigating Xauxa settlements, given their scale, I expected that visual display through architecture would have been an important means for expressing hierarchical relationships and status differentiation during both periods. I also expected that face-to-face relations (or gatherings) in the public sector would have expanded with the onset of Inka control, although it was not clear whether those activities would have been concentrated in Inka centers, in local communities, or both.

In the sections that follow, I examine Xauxa household architecture and settlement organization during the Wanka II period, in communities from different levels within the settlement hierarchy. I then evaluate continuity and change in these patterns to understand the impact of Inka rule on local settlement organization during Wanka III.

WANKA II

Many Wanka II settlements occupied strategic locations atop high ridges or knolls. Their remote and inaccessible locations, coupled with the presence of massive masonry fortification walls, suggest that conflict among groups strongly influenced the settlement pattern of the period (LeBlanc, 1981:370–372). As discussed in Chapter 4, Wanka II settlements ranged in size from hamlets to small villages such as Chawín (J40), which had an estimated population of 504 to 840, to regional centers such as Tunanmarca (J7), which housed at least 7,955 inhabitants and perhaps as many as 13,259 (Table 6.1). The distributions of both ceramic styles (LeBlanc, 1981; Costin, 1986) and lithics (Russell, 1988) further suggest that Tunanmarca was a regional center associated with the smaller sites of Umpamalca (J41) and Chawín, among others.

During this period, Xauxa houses were circular or D-shaped in plan, built from chunks of limestone quarried from the outcrops upon which the settlements rested. These stones were laid, usually without modification, in rough courses held together by mud mortar. Dwelling walls consisted of a double row of these stones sandwiching a central core of rubble fill (Figure 6.1). The dimensions of Wanka II structures were fairly consistent. At

Table 6.1. List of Sites Discussed in the Text

Site	Residential area (ha)	Time period	Estimated population	Estimated number of patio groups
Chawín (J40)	5.6	Wanka II	504–840	167
Umpamalca (J41)	14.8	Wanka II	3,889–6,482	359
Tunanmarca (J7)	25.4	Wanka II	7,955–13,259	1,276
Hatunmarca (J2)	73.7	Wanka II	6,633–11,055	?
Hatunmarca (J2)	27.4	Wanka III	2,466–4,110	?
Marca	27.6	Wanka III	2,484–4,140	?

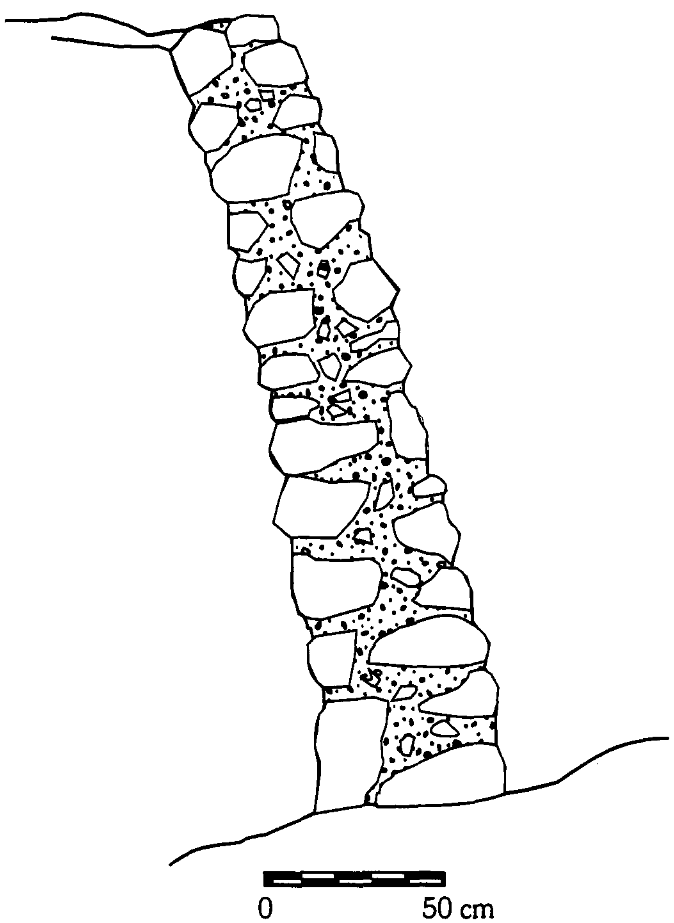

Figure 6.1. Cross-section of a *pirku* (fieldstone) wall; the batter, or inward cant, of the upper portion of the wall increased the stability of Xauxa residential structures (redrawn from LeBlanc, 1981 :70).

Figure 6.2. A residential structure at Tunanmarca (J7), located in the excavated patio group 7=2. The patio group wall is visible on the left.

Tunanmarca, the mean structure floor area was 8.9 m^2 (*s.d.* = 3.6; *N* = 127). Wall widths ranged from 30 to 70 cm, and larger structures had slightly wider walls. The walls of each structure canted inward slightly near the roof, approximating a dome shape, where they reached a maximum height of about 2.5 m. UMARP's excavations recovered scant evidence for roofing materials, but the roofs were presumably thatched. Each structure had a narrow entrance, 40 cm to 1 m wide. As Figure 6.2 shows, the entrance was sometimes framed using trimmed stones and capped by a single horizontal lintel stone.

These circular structures, in groups of one, two, or as many as six, were arranged around a central, unroofed space. The entire cluster was enclosed by a masonry wall to create a discrete household compound (Figure 6.3), called a *patio group.* Packed densely together, patio groups formed the residential sectors of Wanka II settlements (Figures 6.4a, b). The sites were dissected by a network of narrow winding paths, 1.0 to 1.5 m wide, that permitted passage through the aggregated residential clusters.

Levels of Organization

The patio group is the most easily recognized architectural division within Wanka II settlements. Its focus was the unroofed patio space, where evidence for subsistence-related activities was recovered consistently in excavations (Earle *et al.,* 1987). In his survey of village organization, Flannery (1973:30) concluded that circular huts, arranged around a central activity area, usually house a "basic labor group." Xauxa patio groups conform to this general pattern, and traditional sources also indicate that the patio group housed a

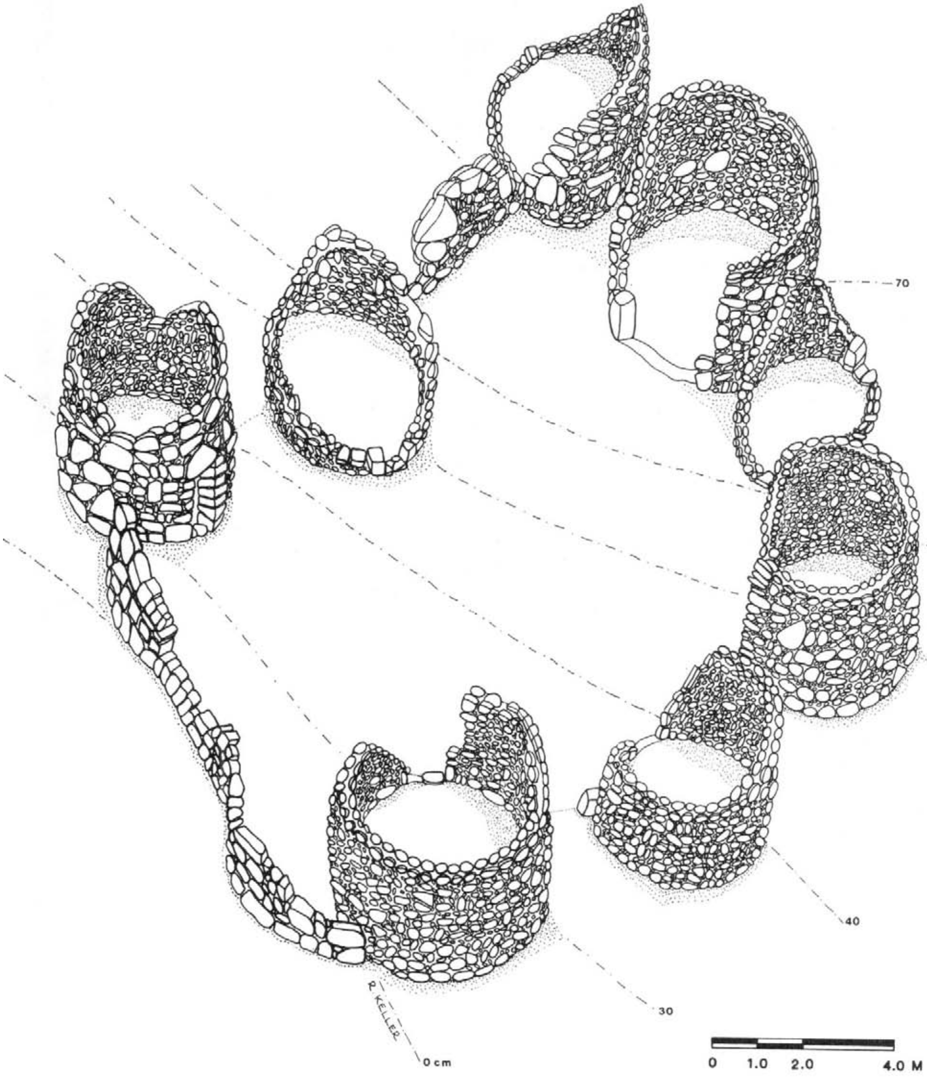

Figure 6.3. Drawing (by R. Keller) of the residential compound 7=2, located within the site of Tunanmarca (J7), showing the arrangement of circular structures around a central, unroofed patio space.

nuclear family and possibly other related individuals (Earle *et al.,* 1987:9; Lavallée and Julien, 1973). The floor plans of individual patio groups varied to incorporate rock outcrops and terrace retaining walls. At Tunanmarca, strings of patio groups shared upper and lower terrace walls and were apparently constructed as a unit. In addition, adjacent patio groups sometimes shared walls to create a unique floor plan for each. Despite this individual variation, however, the basic *design*— structures arranged around a central unroofed space—was consistently reproduced.

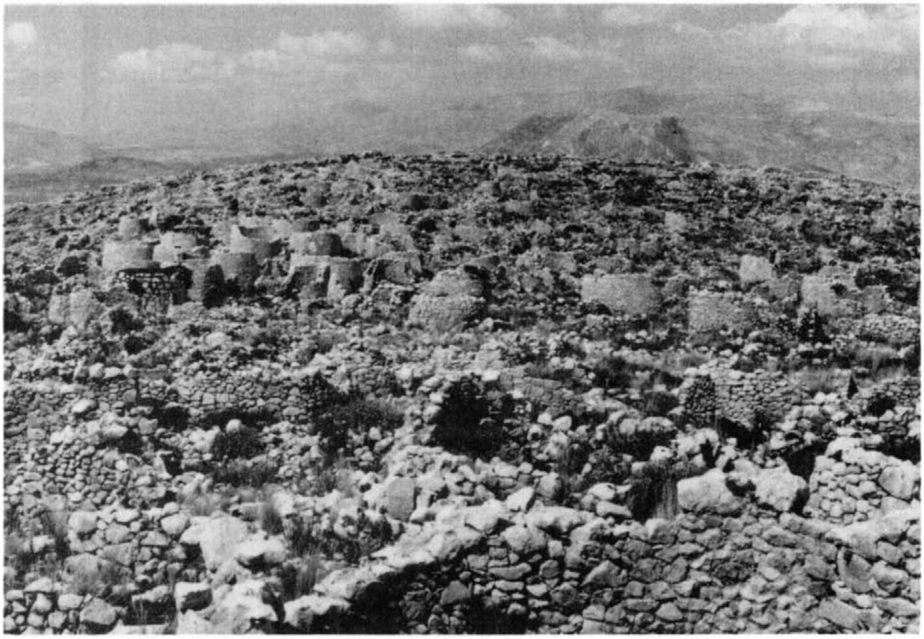

Figure 6.4a. Photo of Tunanmarca (J7), showing its dense residential sectors (photo courtesy of Glenn Russell).

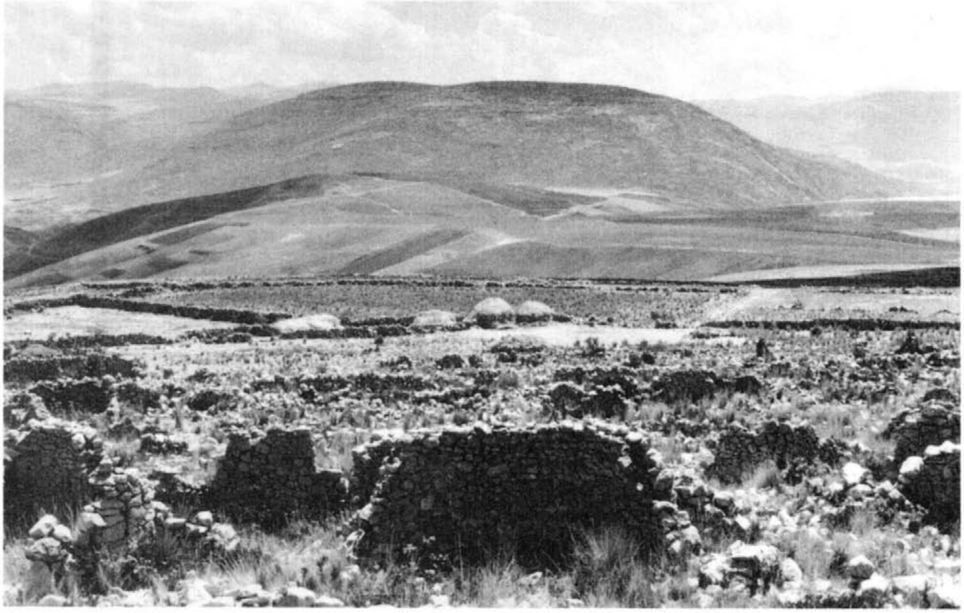

Figure 6.4b. Photo looking towards the hilltop where Tunanmarca (J7) is located. The two fortification walls encircling tightly clustered patio groups are visible on the upper slope and top of the hill (photo courtesy of Glenn Russell).

At the same time, the floor area of patio groups varied widely. Differences in both the size and number of structures (from 1 to 6) affected the total roofed area within each patio group, while the varying sizes of the central patios further contributed to overall variation in total floor area. To assess these differences and determine their significance, roofed areas

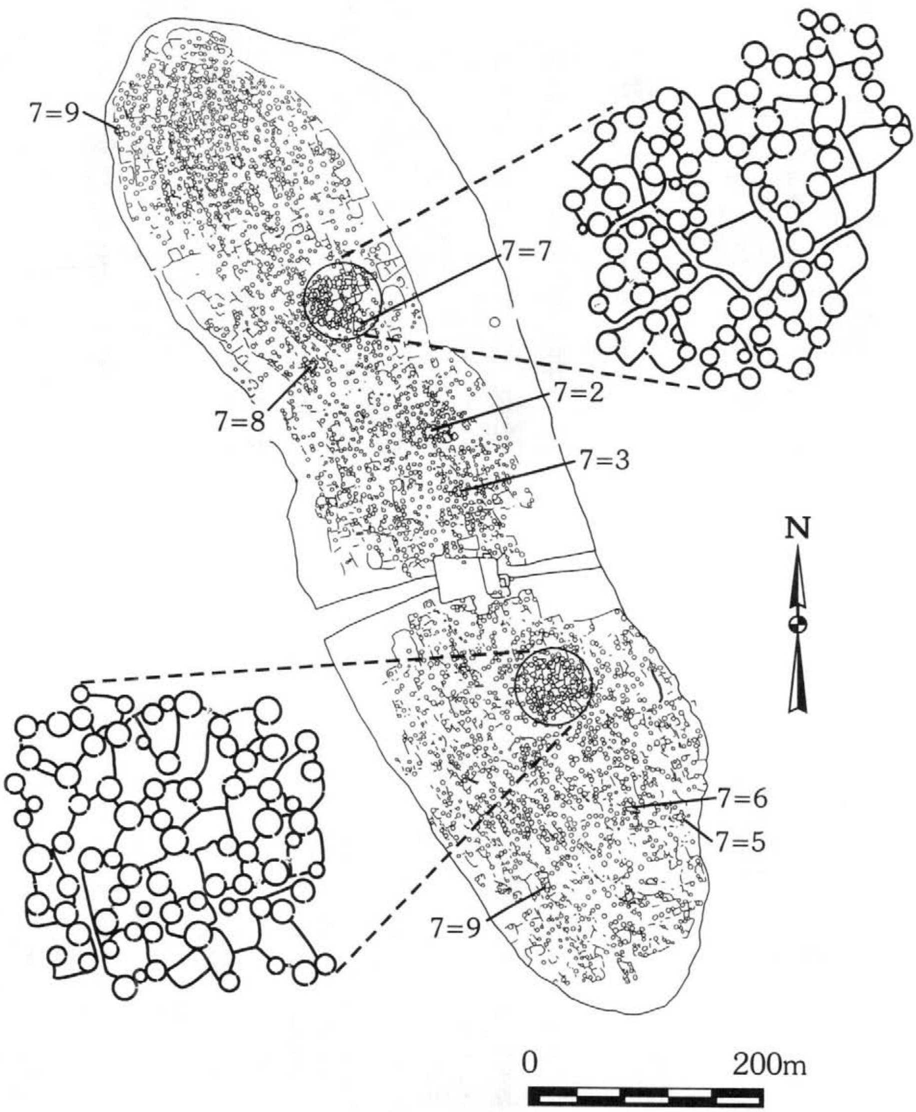

Figure 6.5. The Wanka II regional center of Tunanmarca (J7). The locations of the eight excavated patio groups discussed in the text are indicated by the numbers in bold. The two circles show the locations of the patio groups selected randomly for detailed study of structure size, patio group area, and access patterns among residential compounds. These magnified sections show all identifiable entrances, patio group walls, and paths.

and patio areas for 67 patio groups at Tunanmarca were measured. This sample includes all patio groups located within a circle of25 m radius drawn around a point selected at random in each of the two residential sectors (Figure 6.5; see Chapter 4, this volume). Histograms for total roofed area (Figure 6.6a) and patio area (Figure 6.6b) both show distributions that are skewed to the right, toward the upper end of the distribution (Figure 6.6a: skewness coefficient = 1.13; Figure 6.6b: skewness coefficient = 1. 16).[2]

This skewed distribution indicates that a few patio groups had roofed areas or patios that were significantly larger than those of the rest of the sample. Furthermore, in some cases, oversized patios are found in the same compounds that had larger roofed areas. Figure 6.6c shows the total floor area of each patio group, with the roofed area represented by the shaded portion of the bar and the patio area represented by the unshaded portion. At the high end of the distribution, five compounds (or 7.5%) are distinct, with total compound areas that range from 136.9 to 176.5 m^2 ($\bar{x}$ = 74.0 m^2). Each of these has a patio greater than 120 m^2, well above the sample mean of 58.1 m^2 (s = 28.8). In addition, three have roofed areas that are among the largest in the sample (range 26.1–38.5 m^2). The other two lie at, or below, the mean for roofed area ($\bar{x}$ = 16.9 m^2, s = 8.6). Together, these data suggest a tendency for compounds with greater roofed areas to be associated with oversized patios.

At the same time, however, the sample exhibits enough variation to suggest that the relationship of roofed to unroofed space was not simply a function of the size of a domestic group. Social status, as well as the intended uses of domestic space associated with status, also appear to have influenced compound dimensions and the apportioning of household space. To identify how social status, political activities, and household space needs jointly shaped residential architecture, 1 turn to UMARP'S excavated patio group sample to understand how production, consumption, and activities, as well as the structure of political relations, affected house form and the uses of space.

The excavated assemblages considered here include 15 patio groups from Wanka II (from the sites Umpamalca and Tunanmarca) and 13 from Wanka III (from Marca and Hatunmarca) that were chosen by both random and purposive procedures (see Chapter 4, this volume, for a full discussion of the sampling procedures). Because of the excellent preservation of the masonry architecture, especially at Wanka II sites, architectural features were a means for UMARP to identify and include elite compounds in the excavated sample. After several years of fieldwork, it was clear that elite compounds were fewer in number (perhaps 5% of the total), often larger (total compound area or more structures), and some had fine masonry exteriors. In addition, larger compounds tended to lie close to plazas or other open spaces, and these elite compounds appear to have been more numerous at the larger sites as well. The sample includes several purposefully chosen elite compounds that exhibit all of these features: as many as six structures, fine masonry, and large compound areas. Other elite patio groups included only some of these traits, and the remainder of the sample are randomly chosen, commoner households from both different time periods and different sites within the hierarchy.

[2] The coefficient of skewness measures the tendency for one tail of the distribution to extend either far above or far below the mean. A positive value indicates that the higher values of the distribution extend well above the mean, while lower values are grouped together closer to the mean.

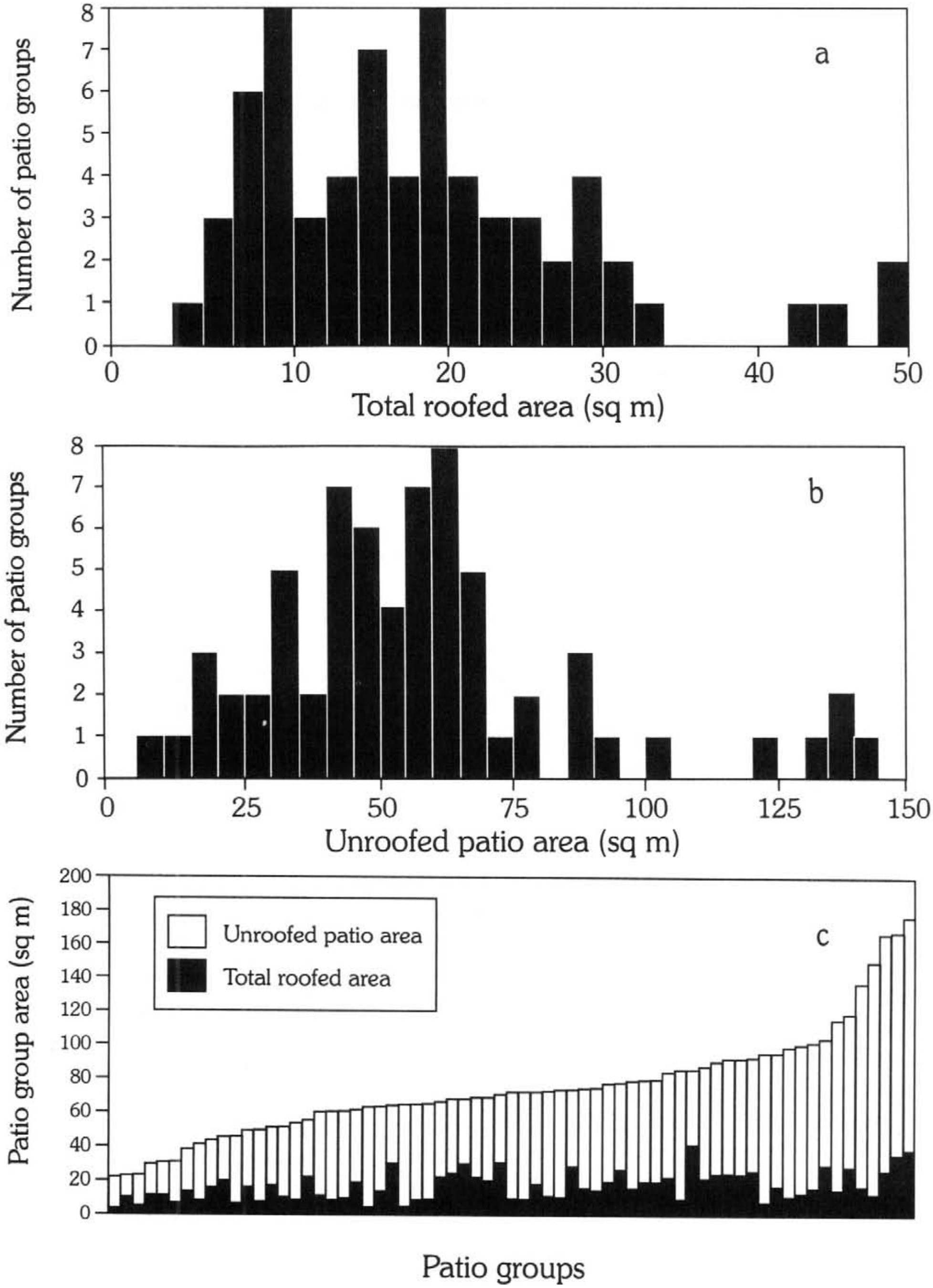

Figure 6.6. (a) The distribution of *total roofed area* for the 67 patio groups in the Tunanmarca (J7) random sample. (b) The distribution of *unroofed patio area* for the 67 patio groups in the Tunanmarca (J7) random sample. (c) The distribution of *total patio group area* for the 67 patio groups in the Tunanmarca (J7) random sample. Each bar represents the total area of a single patio group. The dark portion of the bar indicates the total roofed area and the light portion indicates the unroofed patio area for a particular patio group.

The architectural characteristics of this sample are summarized in Table 6.2. All but one of the compounds initially classified as elite based on architecture yielded remains supporting this classification. Elites had (on average) more roofed space than commoner households, and most also had oversized patios. At the same time, the ratio of patio space to roofed space is consistently lower for elite households (elites: $\bar{x}$ = 2.93, s = 1.63; commoners: $\bar{x}$ = 3.77, s = 2.30), which indicates that elite families filled more of their available space with structures. Given that elites began with larger areas, this difference is even more pronounced, suggesting that elites had greater access to labor and raw materials for house construction. Given the greater roofed area in elite compounds, these residences may have housed larger families, extra personnel, or, alternatively, provided more roofed space per person.

This variation in residential architecture, suggestive of differences in household size and status among the Xauxa, is mirrored in consumption patterns. Elite households had preferential access to foods such as maize, camelid, and deer, as well as to exotic goods such as marine shell, nonlocal ceramics, and metals (Earle *et al.,* 1987; Costin and Earle, 1989; Hastorf, 1993; see also related chapters in this volume). Utilitarian ceramics, particularly large basins and storage jars used for large-scale food preparation and consumption, also occur in disproportionately greater concentrations in elite households. This evidence suggests that elites supervised the preparation of foods for feasts and that the oversized patios in elite dwellings were settings for feasting (Costin, 1986:324–325; LeCount, 1987; Costin and Earle, 1989:708). That ceremonial activities were centered inside elite residences during Wanka II emphasizes the importance of the domestic group in Xauxa political organization.[3] The greater size of elite compounds, and especially the oversized patios, were due in part to their function as settings for feasts.

Elite compounds at Tunanmarca as a group tend to cluster in central, elevated parts of the residential zones and many lie close to the central plazas. This location conferred both communicative and instrumental advantages, because the compounds' fine masonry exteriors were visible from the surrounding zones, while their occupants also commanded clear views across adjacent zones of commoner residences. Thus, at the regional center, elites had begun to aggregate in strategic locations, although the boundaries of these clusters were not clearly demarcated or otherwise separated from the rest of the site. Because other elite patio groups lie outside these zones, and because the architecture within elite areas varies widely in size and quality of masonry, the overall impression is that these elite sectors had developed over time, as much the result of historical associations among elites as through further conscious efforts to solidify status differences. It is instructive to note that elite compounds at Umpamalca, a dependent town with no public sector, were dispersed throughout the settlement.

During Wanka II, then, household status distinctions influenced compound size, although the greater size of elite compounds was also due to the use of patios for feasts. Furthermore, although status differences inferred from architecture were generally

[3] Bernabé Cobo, who wrote extensively about pre-Hispanic cultures in Peru, observed that "they ate in public, all of the village, in the patio of the chief" [comia en público todo el pueblo en el patio del *cacique*] (Cobo, 1956 [1653]:245).

Table 6.2. Summary of Architectural Dimensions for Excavated Patio Groups.

Patio group	Time period	Status	No. of structures	Unroofed patio area (m^2)	Total roofed area (m^2)	Patio group area (m^2)
J41=4	Wanka II	Commoner	2	15.4	9.7	25.1
J7=9	Wanka II	Commoner	1	22.9	5.7	28.6
J7=4	Wanka II	Commoner	1	25.4	5.1	30.5
J41=5	Wanka II	Commoner	2	17.6	14.5	32.1
J7=5	Wanka II	Commoner	1	37.8	7.6	45.4
J7=3	Wanka II	Commoner	2	29.0	17.8	46.8
J7=6	Wanka II	Commoner	1	44.5	10.2	54.7
J2=4	Wanka II	Commoner	1	43.0	15.9	58.9
J7=8	Wanka II	Commoner	3	45.2	20.7	65.9
J41=6	**Wanka II**	**Elite**	**4**	**71.0**	**42.6**	**113.6**
J41=8	**Wanka II**	**Elite**	**3**	**95.5**	**21.4**	**116.9**
J7=7	**Wanka II**	**Elite**	**6**	**67.3**	**54.1**	**121.4**
J41=7	Wanka II	Commoner	1	135.0	13.6	148.6
J7=2	**Wanka II**	**Elite**	**6**	**111.0**	**54.5**	**165.5**
J41=1	**Wanka II**	**Elite**	**3**	**191.4**	**35.8**	**227.2**
J54=9	Wanka III	Commoner	1	38.0	17.3	55.3
J2=6	Wanka III	Commoner	1	65.4	9.6	75.0
J2=2	Wanka III	Commoner	1	68.3	10.8	79.1
J54=4	**Wanka III**	**Elite**	**3**	**57.0**	**34.4**	**91.4**
J54=2	Wanka III	Commoner	3	60.2	47.2	107.4
J54=6	Wanka III	Commoner	2	90.0	33.3	123.3
J2=5	**Wanka III**	**Elite**	**4**	**99.4**	**41.9**	**141.3**
J54=10	Wanka III	Commoner	3	109.0	53.5	162.5
J54=7	**Wanka III**	**Elite**	**2**	**124.0**	**45.0**	**169.0**
J54=1	**Wanka III**	**Elite**	**3**	**126.5**	**45.7**	**172.2**
J54=5	**Wanka III**	**Elite**	**2**	**191.9**	**57.5**	**249.4**
J2=3	**Wanka III**	**Elite**	**3**	**247.0**	**33.3**	**280.3**
J2=1	**Wanka III**	**Elite**	**6**	**132.0**	**173.3**	**305.3**

[a] Elite households are indicated by bold typeface. Sites include Hatunmarca (J2), Tunanmarca (J7), Umpamalca (J41), and Marca(J54).

confirmed in study of the excavated materials, the architecture of elite compounds varied widely. Individual elite households appear to have been consolidating their social positions through the strategic uses of resources, including feasting and the elaboration of exterior masonry, but at the same time, the architectural evidence indicates that Xauxa elites remained closely associated with their commoner neighbors.

Beyond the household level, site layouts suggest that two broader levels of organization were present: The first of these are internal districts or barrios, defined in some cases by walls and in others through access patterns connecting adjacent patio groups; a second level is a dual division recognizable in at least three major sites (Hatunmarca, Tunanmarca, and Llamap Shillón).[4] Unfortunately, because fieldwork to document these broader divisions had to be deferred for political reasons, this discussion must remain fairly general in scope.

Some patio groups were not directly accessible from the paths but could be entered only through neighboring compounds. This arrangement suggests that the patio areas inside the compounds were used as passageways among neighbors, which implies frequent interaction among small groups of residents. Because these interactions blurred the boundaries separating household space from public space, at least locally, these clusters may have housed kin groups or closely related families who shared access to each other's patios. Related evidence is seen in the walls that divide settlements such as Tunanmarca, Umpamalca, and Llamap Shillon into smaller divisions that may correspond to neighborhoods. At Llamap Shillón,the walls run the width of the settlement, although at the other sites they are less distinct, and at present we lack the data to consider their organizational significance more fully.

The larger-scale physical divisions of settlements suggest intriguing possibilities for study of Xauxa social organization, also unexplored to date. Analyses of the Xauxas and other highland groups show that dual divisions were a central element of sociopolitical organization before and under Inka rule. These are usually referred to as *Hanan* (upper) and *Hurin* (lower) halves. They can encompass social units ranging from the *ayllu* to entire halves of Inka provinces (Chapter 4, this volume). Some authors have described evidence for a close correspondence between dual social organization and architectural divisions (Netherly and Dillehay, 1986), although others (Moore, 1995) question whether these principles were consistently expressed in built forms.

It is difficult to make such a direct connection in the Xauxa area without further testing for two reasons. First, only the largest Xauxa settlements contained dual divisions. Each was situated on a ridgeline covering two knolls that were encircled for defensive reasons. Because none of the smaller settlements, each located on a single knoll, exhibits a dual division, the pattern may reflect topographic setting rather than social structure. Second, documentary sources from the early Colonial Period suggest that members of more than one *ayllu* lived in much smaller settlements under the Inka, and also that members of a single *ayllu* resided in more than one settlement. Therefore, no clear correspondence can as yet be demonstrated between Xauxa social groupings and dual architectural division.

In summary, the residential compound is the most easily recognized organizational unit in Wanka II settlements, although broader social divisions are suggested by shared access

[4] The site of Llamap Shillon lies on a knoll above the confluence of the Ríos Mantaro and Quishuarcancha. Because this settlement was investigated only through surface survey, we do not have the data necessary for a detailed comparison with the Yanamarca Valley sites.

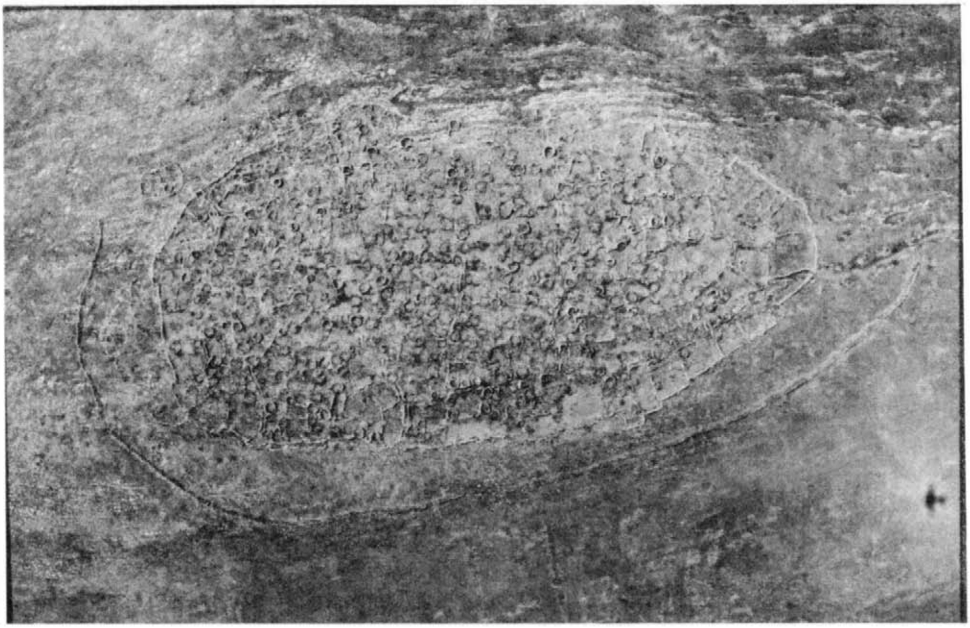

Figure 6.7. Photograph ofthe site of Chawín (J40) from the air, courtesy of the Servicio Aerofotográfico Nacional del Perú.

among adjacent patio groups and internal walls. At Tunanmarca, a concentration of elite patio groups in elevated, central areas suggests that status distinctions also influenced residential organization to some extent, although status expressed through architecture varied in its material forms. Finally, the dual division of large settlements suggests that Andean principles of duality and *ayllu* structure may have affected settlement form and residence patterns, although clarification of this correspondence will require further fieldwork.

Planning

Regularities in patio group design evolved out ofthe interaction between cultural ideas about house design and the space needs of households. Documentary sources indicate that house construction was undertaken as a cooperative and reciprocal effort by members of a community (Garcilaso de la Vega, 1966[1609]:Bk.VI: Chp.35:395). Because some strings of adjacent patio groups rest on shared terraces and appear to have been constructed together, and because the Wanka II period was relatively brief, the sites probably grew rapidly as defensive concerns mounted. Although hundreds ofpatio groups were built and occupied to create these large settlements, the residential sectors show little formal or planned structure.

Chawín (J40), the smallest ofthe Xauxa villages considered here, covers approximately 5.6 ha (Figure 6.7). Although open spaces are visible just inside the fortification wall, the majority ofthe open space within the settlement is confined to narrow pathways that separate patio groups (Figure 6.8a). This open space can be represented as a series of linked spaces—paths and plazas—that surround the buildings (Hillier and Hanson, 1984:89–91). This space can be represented schematically on a plan, or convex map, by filling the open areas with contiguous polygons, or two-dimensional convex shapes, until the open spaces within the settlement are entirely filled.[5] In this way, the shapes of all plazas and paths are reproduced schematically to show the degree to which the settlement's open space consists of wide, open squares in contrast to narrow paths (Figure 6.8b).

Open space also can be represented in one-dimensional, or linear, terms. Axial lines drawn through each open space within the site show the extent to which a person standing within that space would be aware of the rest of the settlement (Hillier and Hanson, 1984:91). For example, wide, straight routes (said to have a strong axial component) facilitate movement, directing people into commonly visited areas of a settlement, such as marketplaces or plazas (Hillier and Hanson, 1984:17). While axial routes promote movement and help visitors orient themselves, plazas (and other convex spaces) act as settings for gatherings and public activities. Open spaces also draw attention to features of the landscape and provide other visual clues about the ordering of space.

The convex map of Chawín (Figure 6.8b) demonstrates that this site's open space consists almost entirely of narrow, rectangular spaces linked end to end (except at the edges of the settlement). Of note is the apparent absence of plazas within the residential clusters. The axial map (Figure 6.8c) shows that no part of the winding path network has strong axial lines. Chawín has no central plaza or public architecture, and the convex and axial representations together suggest little planning. An individual passing through Chawín would be aware of only a small part of the site at any moment. Movement into other parts of the settlement would not increase that person's awareness of the surrounding space. This lack of differentiation and absence of planning suggests that this village was essentially a residential settlement used by inhabitants familiar with its layout.

The configuration observed for Chawín might be expected from its size and position in the site hierarchy. Interestingly, however, axial and convex studies of larger sites, including the regional center of Tunanmarca, show similar patterns. At both Umpamalca (a town) and Tunanmarca, the residential sectors are clusters of patio groups dissected by winding paths. Umpamalca (J41) (Figure 6.9a), measures 14.8 ha, about three times the size of Chawín, with about 359 patio groups densely packed together. While the larger scale makes this site internally more complex, the axial map (Figure 6.9b) shows that it, too, lacks a central plaza, public architecture, and evidence of a planned layout. Comparison of the axial maps shows that the sites are similar except for their scale. The small open areas around the perimeter of Umpamalca comprise less than 6% of the total site area.

The regional center, Tunanmarca (J7), is much larger, enclosing an estimated 4,420 structures within its walls. This site has the highest structure density of the sites studied by UMARP. The residential sectors, spanning two knolls, together cover 25.4 ha and are enclosed by defensive walls. Between the knolls, the site is divided by a walled corridor roughly 60–120 m wide. At the center of this corridor lies a small central sector consisting of two walled plazas. The smaller plaza contains two rectangular structures; additional circular structures are arranged around its edges (see Figure 6.5). Because regional centers

[5] For a full discussion of the procedure, see Hillier and Hanson (1984:82–142).

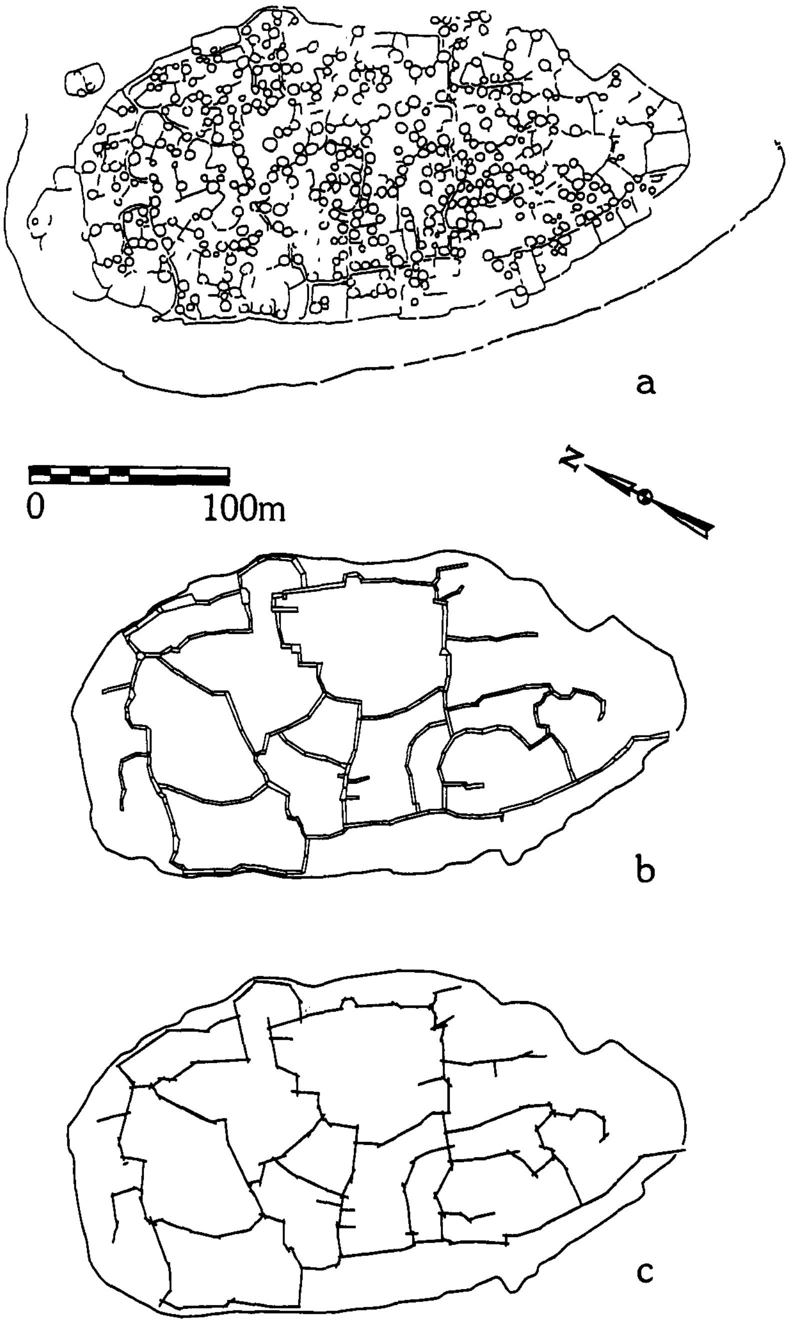

Figure 6.8 (a) Site plan ofChawín (J40). Because it is remote and difficult to reach, this Wanka II settlement is unusually well preserved and, as a result, many of the patio groups and paths throughout the site are visible on the site plan. (b) Convex map ofChawín (J40), drawn using the air photo and site plan. The convex map shows the organization and form of open spaces throughout the settlement. (c) Axial map of Chawín (J40), drawn using the air photo and site plan. The axial map shows the linear arrangement of paths throughout the settlement.

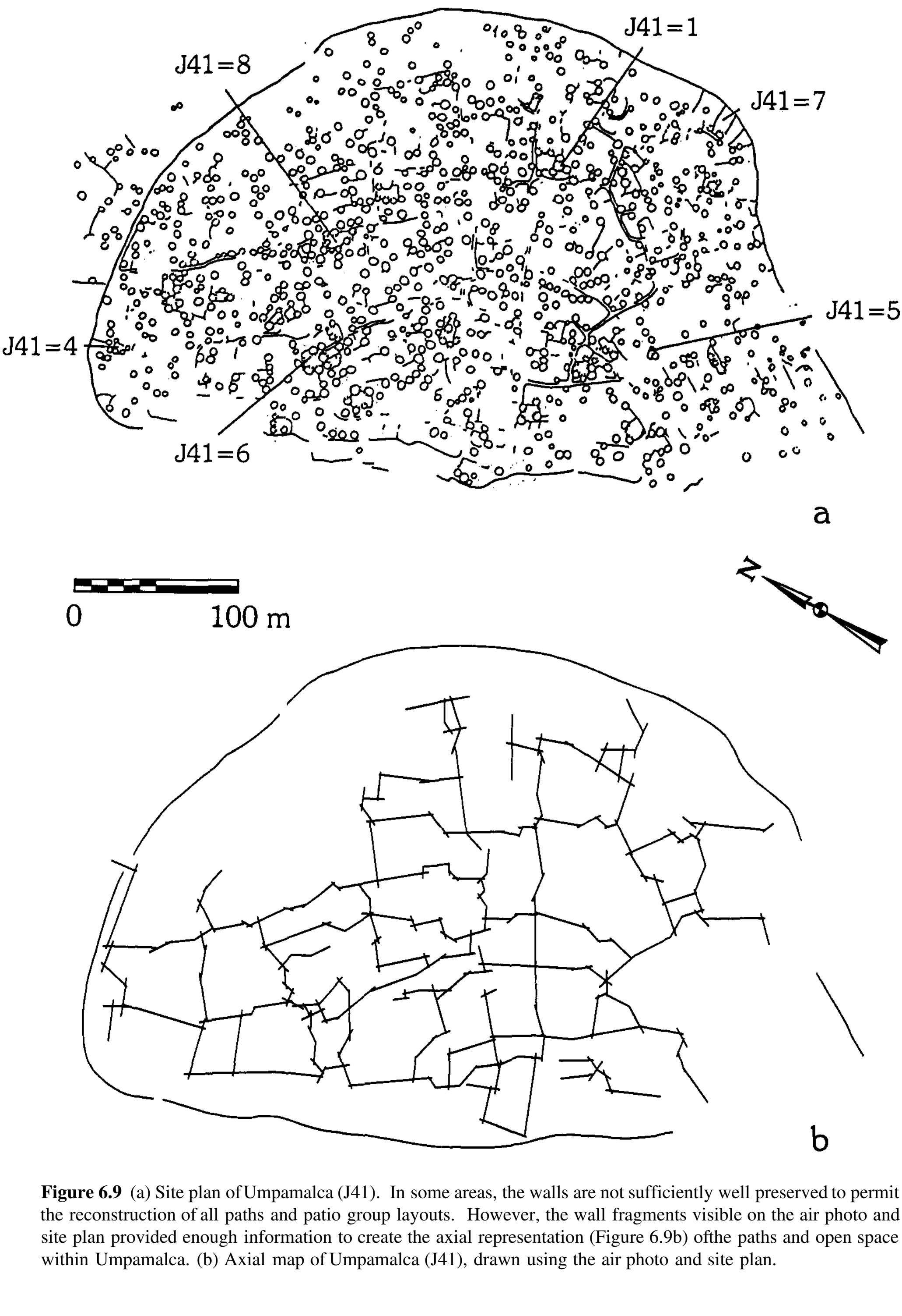

Figure 6.9 (a) Site plan ofUmpamalca (J41). In some areas, the walls are not sufficiently well preserved to permit the reconstruction of all paths and patio group layouts. However, the wall fragments visible on the air photo and site plan provided enough information to create the axial representation (Figure 6.9b) ofthe paths and open space within Umpamalca. (b) Axial map of Umpamalca (J41), drawn using the air photo and site plan.

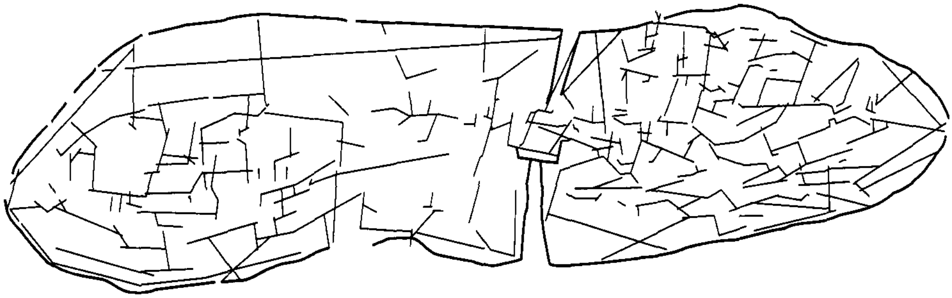

Figure 6.10. Axial map of Tunanmarca, drawn using the air photo and site plan. While the architectural preservation of the southern knoll, as well as in parts of the northern knoll, did not permit a complete axial rendering, this map demonstrates that the overall organization of the site closely resembles the layouts of Umpamalca (J41) and Chawín (J40).

generally have civic or ceremonial architecture before it appears at smaller settlements (Flannery, 1976), the presence of this central complex reinforces Tunanmarca's paramount position in relation to the other sites.

However, despite the presence of this complex, the residential sectors of Tunanmarca closely resemble those of Chawín and Umpamalca. Paths that lead from the entrances to the site wound through the residential areas and permitted access to the plazas only after a number of forks and bends had been navigated successfully. Because these routes were as circuitous as the path networks at the other sites (Figure 6.10), it seems unlikely that they were planned. In fact, LeBlanc (1981) notes that Tunanmarca and its associated sites appear to be more irregular in their layouts than the otherwise comparable Asto settlements described by Lavallée and Julien (1973) for a region just to the south. Perhaps these irregular configurations contributed to site defensibility, since their dense layouts might slow the progress of intruders (Rowlands, 1973:456). The general impression is that Wanka II settlements grew by accretion, without a centrally directed plan for their internal organization or the provision of public space.

Numerical analysis of the convex and axial maps confirms the visual assessment of the open space structure (Table 6.3).[6] The most interesting result is the consistency in the values

[6] The numerical descriptions are derived from the convex and axial maps. They provide an additional measure of similarities and differences in the layouts of settlements. The formulas used to derive these values are discussed in Hillier and Hanson (1984:98–105). Convex articulation is the ratio of the number of convex spaces to the number of buildings. Higher values indicate a greater degree of breakup of the open space. Axial articulation, the ratio of the number of axial lines to the number of buildings, provides a similar measure, taken from the axial map. Again, higher values suggest that the open space is broken up into numerous segments. Axial integration of convex spaces is a ratio of the number of axial lines to the number of convex spaces. Here, higher values indicate less axial integration of the open space. Grid convexity and grid axiality compare the convex and axial maps to a standard grid pattern. The formulas are omitted here, but values for grid convexity range from zero to 1, with higher values indicating greater conformity to a grid. Values for grid axiality also range from zero to I, with higher values indicating greater conformity to a grid. Finally, ringiness values measure the tendency of the open space to form connected rings around buildings. The ratios compare the number of rings observed to the maximum number possible for a given number of convex spaces or axial lines. Higher values indicate greater ringiness.

Table 6.3. Numerical Descriptions of Convex and Axial Maps

Numerical description	Chawín (540)	Umpamalca (J41)	Tunanmarca (J7)
Convex articulation	1.35	1.31	0.81
Axial articulation	0.96	0.65	0.54
Axial integration	0.71	0.63	0.67
Grid convexity	0.12	0.13	0.10
Grid axiality	0.06	0.06	0.04
Convex ringiness	0.04	0.05	0.04
Axial ringiness	0.05	0.08	0.05

[a] For a detailed discussion of these values see note 6, this chapter, and Hillier and Hanson (1984:98–105). The values for convex articulation and axial articulation vary primarily because of the marked differences in total site area.

for each site despite its different position in the site hierarchy. The implication, again, is that Wanka II settlements had only marginally begun to exhibit centrally directed use of space. Given the size of Tunanmarca and its population density, its internal organization is remarkably undifferentiated.

By far the most substantial public works were the fortification walls. Catherine Scott (field notes) calculated that the defensive walls encircling Tunanmarca extend over 2.7 miles in total length. Corporate labor was apparently directed toward defense of the settlement, with less effort invested in settings for public activities or other elements of a political landscape. These decisions suggest that elites' authority was closely tied to their roles in coordinating defense, warfare, and the maintenance of fortifications. Individual households were the primary settings for political activities that included consumption of preferred foods and luxury goods and feasts staged to build loyalty and prestige, and to reward followers.

Despite the similar layouts visible across the Wanka II site hierarchy—from village to town to regional center—and the overwhelming proportion of settlement space occupied by residential structures at each level, there is evidence for public activities above the household level. Tunanmarca contained a public sector and had also begun to exhibit areas of separate elite residence. The scale of the settlement, the density of its population, and the presence of the central plaza together indicate that political differentiation was established and being negotiated at a range of levels—from household to *ayllu* to polity.

Face-to-face interactions

The organization of settlements during Wanka II also shaped face-to-face interactions. As discussed earlier, the dense packing of structures within the residential zones left limited

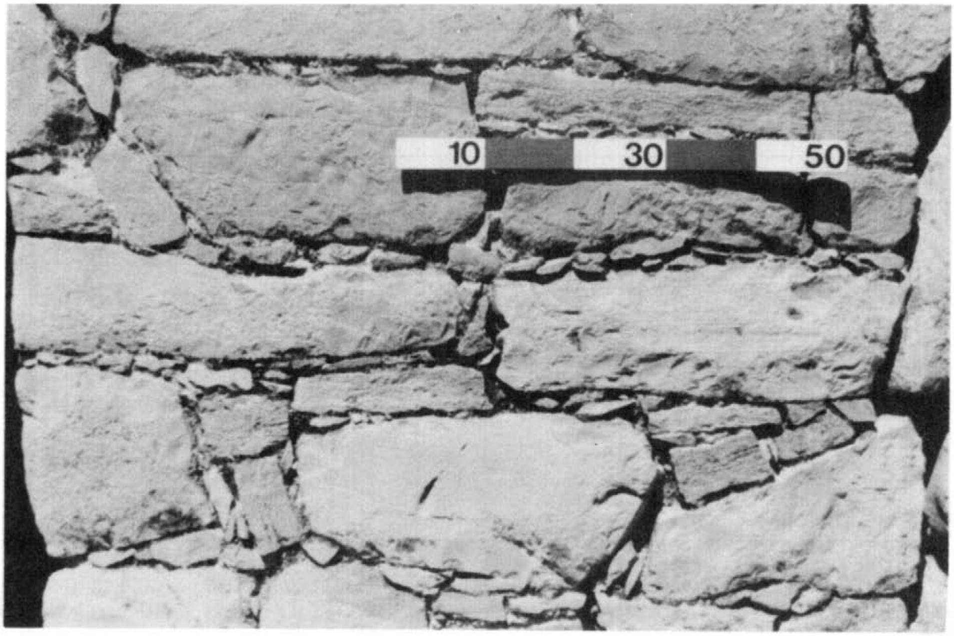

Figure 6.11a. Detail of masonry, from the elite patio group J7=2 (Tunanmarca)

space for public gatherings, and only Tunanmarca[7] had a formal public complex, which was fairly modest in size, As a result, the patio areas within patio groups appear to have been a focal point for local interactions.

As discussed earlier, feasting activities set in the patios of elite compounds suggest that ceremonial hospitality was an important means for elites to negotiate and maintain alliances. From the perspective of face-to-face relations, this spatial setting carried an unambiguous message about the host's identity and status. Similarly, as repeated events, feasts drew participants to elite compounds on a regular basis, focusing attention on their fine masonry exteriors. The high-quality stonework, like the host's generosity, communicated that household's capacity to marshal surplus labor for political purposes. Unlike the feasts, however, the fine masonry broadcast its message every day as an ongoing reminder.

Some elite patio groups, especially those at Tunanmarca, have especially fine masonry. Their walls were built from the same limestone blocks used throughout the settlement, but the stones were more carefully selected and often carefully squared and dressed. The stones were laid in even courses, with numerous small chinking stones filling the gaps between the larger stones (Figure 6.11a,b). Presumably because such tasks were costly, relatively few patio groups displayed fine masonry exteriors. I evaluate and compare these costs using three

[7] During Wanka II, the site of Hatunmarca, also investigated by UMARP, was a regional center comparable to Tunanmarca, and it probably had a central complex as well Because this site's occupation continued into Wanka III, much of the central architecture was modified, presumably to accommodate activities related to the Inka presence, a point I discuss at length in a later section For this reason, and also because much of the site has been farmed, I was unable to include Hatunmarca in the analysis of Wanka II settlements

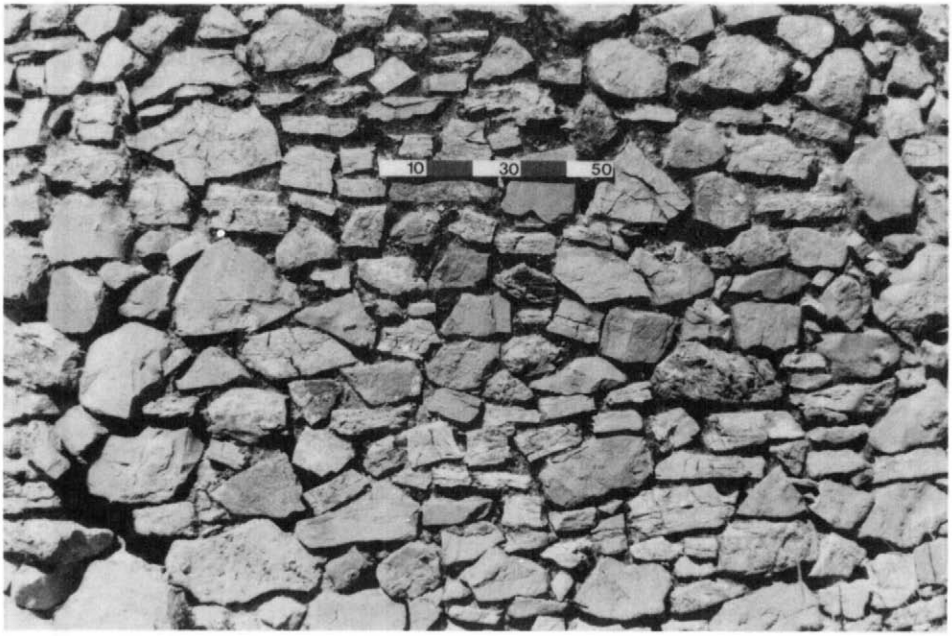

Figure 6.11b. Detail of masonry, from a commoner patio group at Umpamalca (J41) (photos courtesy of Glenn Russell)

related measures: (1) the density of flake debris from trimming the stones, (2) frequency of chinking stones, and (3) overall labor investment estimates for each patio group. Since wall stones were apparently trimmed at the house site by removing flakes to square the block and to smooth its exterior face, the flake debris was discarded in the patio group itself, where it was mixed with soil and used as fill to level the floor. As a result, the fill zone, as well as the occupation zone, contained limestone flakes in varying densities that provide an estimate of the labor invested in preparing the wall stones. These data are summarized in Table 6.4.

All patio groups contained some limestone flakes, probably from minor shaping of wall stones during construction. However, at Tunanmarca, the flake densities in elite households are significantly higher, for both occupation and fill contexts. This confirms visual evidence that the masonry of 7=2 and 7=7 was of unusually high quality. The walls of these patio groups incorporated large trimmed and dressed stones. In contrast, the flake density values for commoner households are much lower on average. Interestingly, too, the flake density values for Umpamalca do not vary sufficiently to distinguish elites from commoners, probably because elite masonry at Umpamalca was visually of lower quality than that at Tunanmarca. If these variations in masonry quality express gradations in social status, then elite households at the regional center may have been of higher status than those residing at the town. Clearly, too, these data have limitations, although the flake density values do mirror results obtained from visual assessments of masonry quality.

A second measure of labor investment lies in the ratio of small chinking stones to the number of wall stones per unit of wall surface (in this case $1m^2$). The ratio is higher in patio groups with better masonry because the walls incorporate both more chinking stones and fewer (and larger) wall stones per unit of wall surface. The data (Table 6.4) support the

Table 6.4. Summary of Labor Investment Measures Calculated for Each Patio Group Where Data Were Available.[a]

Time Period	Patio group	Flake density, occupation context (flakes/m³)	Flake density, till context (flakes/m³)	Total number of flakes	Ratio of chinking stones to wall stones	Labor investment (hours)
Wanka II	J7=9	656	330	2,589	0.22	415
Wanka II	J7=5	657	1,654	1,862	—	418
Wanka II	J7=4	806	956	2,348	—	459
Wanka II	J41=4	517	517	1,145	0.45	528
Wanka II	J41=5	347	230	1,804	0.34	563
Wanka II	J7=6	1,459	3,167	5,239	—	656
Wanka II	J7=8	584	1,120	3,539	0.33	780
Wanka II	J7=3	450	624	4,176	0.56	807
Wanka II	J2=4	452	763	2,862	0.53	864
Wanka II	J41=7	427	171	1,151	0.95	925
Wanka II	**J41=8**	**510**	**200**	**302**	**—**	**1,266**
Wanka II	**J41=1**	**373**	**562**	**6,505**	**1.91**	**1,881**
Wanka II	**J41=6**	**392**	**163**	**3,153**	**1.53**	**1,988**
Wanka II	**J7=7**	**909**	**1,287**	**6,981**	**1.36**	**2,453**
Wanka II	**J7=2**	**2.211**	**1,162**	**30,427**	**2.60**	**2,592**
Wanka III	J2=2	909	459	5,583	1.00	684
Wanka III	J54=9	314	960	850	1.00	740
Wanka III	J2=6	455	469	3,886	0.87	784
Wanka III	J54=6	81	278	331	—	1,305
Wanka III	J54=2	571	872	6,564	0.29	1,443
Wanka III	**J54=4**	**235**	**425**	**235**	**—**	**1,454**
Wanka III	J54=5	312	0	312	0.22	1,913
Wanka III	**J54=7**	**265**	**351**	**1,599**	**0.12**	**1,955**
Wanka III	**J2=5**	**345**	**624**	**3,913**	**0.55**	**2,033**
Wanka III	J54=10	620	478	3,103	0.54	2,074
Wanka III	**J2=3**	**829**	**336**	**19,399**	**0.14**	**2,270**
Wanka III	**J54=1**	**1,491**	**2,181**	**45,067**	**0.35**	**2,428**
Wanka III	**J2=1**	**1,538**	**848**	**33,540**	**0.48**	**6,609**

[a] Elite patio groups are indicated by bold typeface.

inferences made from the flake-density data and suggest that the addition of chinking stones to exterior walls was generally restricted to elite patio groups.

Finally, labor investment estimates measure differences in the overall costs of patio group construction, taking into account the volume of all walls in the compound, weighted to reflect the costs of improving the visible quality of the masonry.[8] These estimates (Table 6.4) show that differences in overall labor investment clearly separate elites from commoners. For our sample, the elite minimum value, 1,266.3 hours, exceeds the maximum value for commoners, 925.3 hours, That additional labor controlled by elites was largely invested in their own residences rather than being directed toward public construction activities underscores the pivotal role of the household in Xauxa society. The concentration of resources on domestic architecture also suggests that conspicuous consumption during Wanka II was primarily directed toward increasing and magnifying social distinctions at the household level.

The importance of households is also evidenced by the limited scope of public architecture. Simply from the perspective of scale, the central plazas at Tunanmarca suggest that public events set within them were modest in size compared to the population of the site and its associated towns and villages. The proportions of this plaza complex are small in relation to the residential sectors; the area of both plazas, about 2,2 18 m^2, represents well under 1% of the total settlement area.

WANKA III

An extensive resettlement of the Xauxa populace followed the Inka conquest. Many of the high, walled settlements of the Wanka II period were abandoned; Inka period settlements were established closer to lands best suited for maize cultivation. This population movement was part of Inka strategy designed to minimize resistance and rebellion (Rowe, 1946:269; D'Altroy, 1992:188–195). By resettling the valley's inhabitants and establishing a regional administrative bureaucracy, imperial officials hoped to ensure a steady flow of labor and goods into state installations.

Their greater accessibility and locations within the zones of modern cultivation have meant that much of the architecture of Wanka III sites is heavily damaged. The Inka provincial center, Hatun Xauxa, lies under modem Sausa, and although wall fragments are visible throughout the site, most have been destroyed. Subject towns located nearby, including Marca and Hatunmarca, have also been damaged by farming but isolated sectors of pre-Hispanic architecture are preserved within each site and form the basis of the analysis

[8] Using values formulated by Lekson (1987). estimates of labor expenditure (for masonry only) were calculated for the excavated patio groups. For a cubic meter of masonry wall, the labor estimates used were as follows: 8.4 hours of labor to obtain and transport stone; 1.7 hours of labor to obtain and transport materials for mortar; 28.5 hours to mix mortar and construct wall. Of this total, 17.4 hours per cubic meter were spent in minor dressing of the stones and related activities, according to Lekson. To adjust these estimates for the Xauxa architecture, I examined the masonry of each patio group to count chinking stones, to assess the overall visible quality of the masonry (see text), and to look for regular courses of stone. Using 17.4 hours as a base value, the labor estimates were then adjusted according to the presence or absence of each of these variables. The goal was to obtain labor estimates that reflected both the volume of wall construction within each patio group and, where applicable, the additional labor that was invested to improve the visual quality of the masonry

presented here (see Table 6.1). The preservation ofthe architecture does not permit detailed analysis such as that presented for the Wanka II sites but changes are nevertheless visible in the organization and uses of public areas of Wanka III settlements, as well as in the messages conveyed through visual display at the household level. To the degree to which these changes in architecture reflect economic and political effects of Inka rule, they highlight the ways in which state rule affected access to resources, uses of public space, and differences among households within local communities.

Hatunmarca (J2), a Wanka II regional center, was also occupied during Wanka 111 and IV (Figure 4.1). The site's population diminished substantially at the end of the Wanka II period, at which time some sectors were remodeled, apparently for new uses associated with the Inka presence. The remodeling is particularly evident in the center of the southern knoll at Hatunmarca, an areathat was extensively reworked into an elite residential and ceremonial complex (see below). This remodeling is a clear indication that space needs and architectural forms changed with the onset of Inka control. The town of Marca (J54) was founded under Inka rule. Located on a low hill about 5 km north of Hatun Xauxa, it covered 27.6 ha and housed an estimated 2,484–4,140 inhabitants. Because the site was constructed during Wanka III, its architecture and layout allow us to compare Wanka II and Wanka III building forms.

Levels of Organization

The most obvious feature of Wanka III sites is the continuing use of the patio group as residence. Although Marca has a public sector, most of the site consists of patio groups arranged in an irregular layout (D'Altroy, 1981: 134). These patterns suggest continuity in household organization, although the relative scale of household compounds changed in ways that suggest resources for house construction were more equitably distributed among elites and commoners at local sites. A dramatic change is visible, for example, in the size of individual structures. The damaged condition of surface remains at Hatunmarca prevented the collection of data for a sitewide sample of intact compounds, so UMARP instead collected data on the dimensions of individual structures (see Chapter 4, this volume).

As presented earlier, the Tunanmarca (Wanka 11) sample yielded a mean structure size of 8.9 m^2 (s = 3.6; N = 127). The comparable (pooled) sample from Hatunmarca had a higher mean, 14.2 m^2 (s = 9.9; N = 131); if the largest structure is deleted as an outlier, the difference diminishes, but only modestly ($\bar{x}$ = 13.5; s = 5.5; N = 130). At Marca, the measured structures in excavated compounds had an even higher mean of 17.04 m^2 for circular (s = 6.0; N = 17) and 17.25 m^2 for rectangular structures (s = 7.6; N = 4). This increase in structure size was accompanied by a greater range of variation in structure dimensions. The coefficients of variation are similar for Wanka II Tunanmarca (39.9) and Wanka III Hatunmarca (40.5; N = 135) and Marca (44.1) circular structures.[9] This pattern implies that as the mean size of sampled structures got larger in Wanka III, the range of sizes (expressed by increased standard deviations) increased proportionally.

[9] Coefficient of variation: (s.d./$\bar{x}$)(100).

Thus, Wanka III *structures* were larger overall than Wanka II structures and varied more widely in their dimensions. Without a comparable sample of measurements for house compounds, we cannot argue conclusively that *patio group* dimensions exhibited a similar range of variability. However, the Wanka III excavated patio groups at Marca (*N*= 8) show several related trends. First, the total roofed areas of Marca's commoner and elite patio groups were more comparable. Individual structures were larger, and no patio group in the sample had more than three component structures. Second, as a group, the Wanka III patio groups were larger than their Wanka II counterparts (Figure 6.12). The range of variation in total compound area is also greater at Marca (55.3–249.4 m^2) than at Tunanmarca (21.5–176.5 m^2). These comparisons are summarized in Table 6.5 (see also Table 6.2).

The Wanka III patio groups at Hatunmarca reflect some, although not all, of these changes in dimensions. Commoner patio groups J2=2 and J2=6 both had small total roofed areas; like some Wanka II commoner compounds, each had one small structure. At the same time, however, the patio areas in both were substantially larger than those found in Wanka II commoner compounds. As a result, their total compound areas exceed the values for all but one of the Wanka II excavated commoner patio groups. The overall trend toward larger compound areas in Wanka III is illustrated in Figure 6.13.

Those changes may represent more equitable access by commoners and elites alike to labor for house construction under the Inka, especially at the site of Marca. That shift mirrors the generally more even distribution of utilitarian goods during Wanka III; elites no longer enjoyed privileged access to locally produced objects. However, other factors not directly related to social status may also have contributed to modifications of compound and structure dimensions. At the lower elevation settings of Wanka III sites, space was probably not as limited as it had been within Wanka 11 hilltop settlements. Moreover, as other authors in this volume argue, the tribute demands of the Inka led to the intensification of household activities, especially weaving and the preparation of *chicha* and other foods, often conducted by women within the patio groups (Hastorf, 1991). The larger structures of Wanka III compounds may therefore in part reflect a need for more space to accommodate the increases in production taking place within them.

With these explanations in mind, we can also consider the degree to which the larger structure and compound dimensions represent greater status differentiation. Turning to the excavated sample of patio groups from Wanka III, their dimensions (like those of the measured structures at Hatunmarca) exhibit a broader range of variation than the Wanka II sample. To the degree that the size of acompound was tied to social status, such distinctions apparently became increasingly well-defined under Inka rule. Furthermore, if the differences observed between the sites of Marca and Hatunmarca are also tied to status, then political status may have varied more among local communities as well. Other evidence suggesting that architecture expressed a broader range of statuses can be seen in the central residential and public architecture complex at Hatunmarca. There, elite residences J2=1 and J2=3 stand out as the two largest compounds in the entire excavated sample (Figure 6.13; Table 6.2), and at the same time, they were set apart by open space from the rest of the residential compounds, creating a distinct sector of elite residence associated with the public buildings. By expanding the public sector and building their large and conspicuous residences within it, the elites had separated themselves physically and symbolically from the rest of the residential community.

Figure 6.12. Photo looking across the site of Marca (J54).

Table 6.5. Comparison of Mean Architectural Dimensions and Labor Investment Estimates for All Wanka II Excavated Patio Groups with the Mean Values Calculated for the Wanka III Site of Marca (J54). [a]

	Status	Total roofed area (m^2)	Unroofed patio area (m^2)	Labor investment (hours)
Wanka II	Commoner	12.1	41.6	641.4
Wanka II	**Elite**	**41.7**	**107.2**	**2,036.2**
Marca (J54)	Commoner	37.8	74.3	1,390.6
Marca (554)	**Elite**	**45.7**	**124.9**	**1,937.3**

[a] Elite patio groups are indicated by bold typeface.

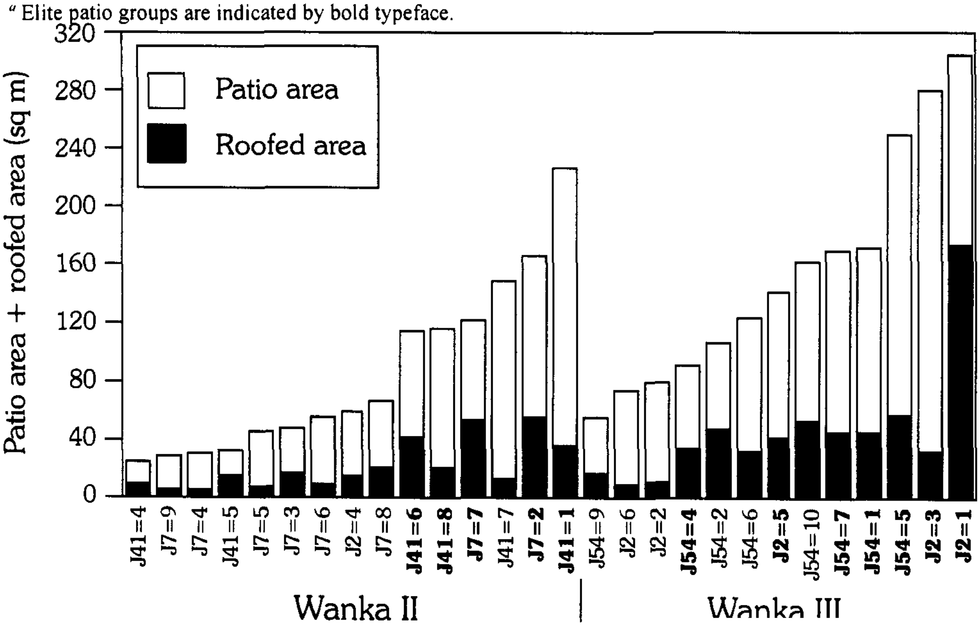

Figure 6.13. Comparison of total patio group area for the Wanka II (left) and Wanka III (right) excavated patio groups. The dark portion of the bar represents the total roofed area of the patio group, while the white portion represents the unroofed patio space. The entire bar represents the total area of the patio group.

Interestingly, although Wanka III elite compounds had oversized patios, their courtyards contained fewer of the ceramic vessel types associated with large-scale food storage. This pattern implies that household feasting was replaced in Wanka III by state-sponsored feasting (Costin, 1986:295–296; LeCount, 1987:27–28; Costin and Earle, 1989). The importance of Inka feasts as integrating public ceremonies has been well documented (Murra, 1960; Morris, 1982, 1985); such ritual events served as payment for work performed on behalf of the state. The spatial settings for these feasts were large plazas that dominated Inka centers, a physical expression of the central role of feasts as a symbol of Inka reciprocity with subject groups (Morris and Thompson, 1985; Hyslop, 1990). At the same time, open space in local settlements may have been expanded and elaborated for ceremonial and administrative activities. 1 examine evidence for this change in the following section.

Planning

The relocation ofsettlements from high ridges to lower elevation settings may have been both a reason for and a consequence ofthe regional peace imposed by the Inka on the Xauxa populace. In either case, defensive considerations were less significant in shaping the layouts ofthe new settlements. The density ofpatio groups at Marca was substantially lower than that observed at Wanka II sites (D'Altroy, 1992:193). Open spaces—probably small public plazas—also lie within the residential zones. The site has only a partial fortification wall, although its positioning might be interpreted as defensive, since the ground drops away steeply at several points around the perimeter. The enclosing wall remains undated, although it may have been constructed during the conflicts of the Inka civil war and the first two decades of Colonial rule. At least in Wanka III, the constraints of defense played a diminished role in determining settlement form.

Hatunmarca and Marca both have discrete sectors that were probably nonresidential complexes, since they are set apart from the residential zones and contain unusually large structures. At Marca, the public complex stands in the northeast end of the site, its buildings incorporating Inka features, and it is set apart from the rest of the site by a wall. These changes in the scale of public sectors suggest that public activities became more frequent and formalized in local communities as well as at the lnka center. In addition to public buildings, Wanka III local sites have more plazas, which also suggests more frequent public activities.

Another manipulation of settlement space is visible at Hatunmarca, where Wanka II period structures were dismantled to create the wide band of space that surrounds the central complex in the southern knoll (LeBlanc, 1981 :65–66) (Figure 4.1). This space increased the visibility ofthe elaborated central plaza complex and also imposed the boundary separating the elites from the rest of the settlement. Removing these structures and placing the elite residences in association with public buildings required labor and planning beyond the resources of a single elite household. This reorganization therefore demonstrated the capacity of these local elites, who were probably aided by Inka officials, to promote themselves to new positions of authority. I defer discussion of the architectural details of this complex for the next section but observe here that the excavated contents of two of these central elite residences (J2=1 and J2=3) confirm the high status oftheir occupants, who had access to especially high proportions of Inkaceramics (D'Altroy, 1992:206; Chapter 10, this volume) and other exotic goods controlled by the state (Earle *et al.,* 1987; Costin and Earle, 1989). The elites and their guests also consumed especially large quantities of maize and camelid meat, probably during feasts. Thus, Hatunmarca's settlement space was redefined to reflect an increasingly hierarchical political structure and the expanded roles of certain elites. In this sense, the uses of space expressed the same messages about status that were implicit in the differential consumption of Inka ceramics, exotic goods, and maize; in fact, this reorganization of space was among the most highly visible of the changes brought about by the Inka.

While the formal public sectors appear to have been created to reinforce the authority of some local elites through ties to the state, these changes also demonstrated the capacity of the Inka to restructure their subjects' daily lives and physical surroundings. In conjunction with those strategies, they also introduced distinctive lnka architectural canons into buildings at both Hatunmarca and Marca, presumably to exploit further their symbolic value and to foster a sense of legitimacy and cohesion among their subjects. As I discuss in the following section, Inka features replaced some local symbols of status, although the extent of this transformation apparently varied by settlement and also according to the architectural context (residential or public).

Face-to-Face Interactions

Public sectors probably served as facilities for new activities at Hatunmarca and Marca, while the ordering of space within and around these complexes drew attention to visual characteristics of the architecture. Some buildings in Wanka III public sectors incorporate Inka design elements, as do some residential compounds. Inka architecture is, as expected, most prominent in the upper levels of the Inka site hierarchy, as the few remaining wall fragments visible at the paramount center, Hatun Xauxa, indicate. Although the standing walls are*pirka* rather than the fine, cut-stone masonry that characterizes parts of some other regional centers, it is possible that cut-stone masonry was present in now-destroyed sectors of Hatun Xauxa. Even the *pirka* walls of Hatun Xauxa are readily distinguished from local (Xauxa) architecture by the massive character of the walls, the size of the buildings, and their rectilinear floor plans and layout (D'Altroy, 1992: 104–111). Trapezoidal niches are visible in several standing walls as well.

Despite the site's condition, LeVine (1985:315–316) has cautiously estimated that the main plaza at Hatun Xauxa may have been as large as 50 ha, if the plaza's scale was proportional to the population of the region. Together, those features of the provincial center confirm that Inka architecture achieved its symbolic impact in part through scale, spaces of vast proportions, and the massive and substantial character of the buildings themselves. Additional features included the niches and gabled roofs—features that were repeated consistently to ensure their easy identification as markers of state installations.

Because Marca was constructed under Inka dominion, it is not surprising that the buildings within its public complex are generally larger than most residential structures, or that some public buildings incorporated interior wall niches or rectangular floor plans. Their presence may indicate that the complex housed activities associated with the state, although, at present, we lack the excavated materials to confirm this interpretation. Unlike the architectural canons of status in Wanka II, which had in common high labor costs, some features of the Inka canon could have been more easily copied or imitated. Thus, it is also possible that the complex at Marca is a local imitation of lnka architecture, built in an attempt to share the authority of the state.

At Hatunmarca, the greater costs of planning, remodeling, and constructing the central complex make it less likely that its use of Inka features represents a local imitation of lnka architecture than the state's more direct intervention and planning. The unusual size of its elite compounds and the presence of other Inka features (including a rectangular structure in J2=1 and features such as wall niches, gabled roofs, and substantial masonry in associated

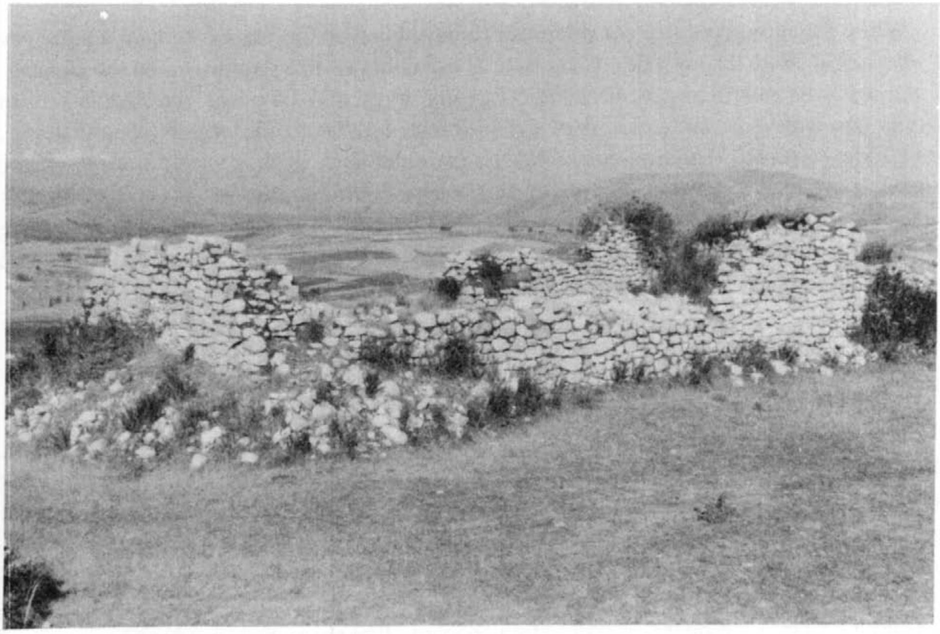

Figure 6.14. Photo of the central rectangular structure at Hatunmarca (52).

buildings) strongly suggest an Inka role in their construction (Figure 6.14). Perhaps even more important were the high costs of constructing compounds J2=1 and J2=3. These patio groups rest on an artificially elevated and leveled surface, underneath which excavations revealed the foundations of razed Wanka II structures. The eastern terrace wall supporting J2=1 stands over 2 m high and is buttressed with large, unmortared stones (Figure 6.15). This elite compound has by far the highest estimated labor investment (6,609 hours) of the excavated sample. These collective costs, together with the use of Inka features, make it likely that the Inka played a role in remodeling the central complex.

Inka features were also adopted in residential compounds outside of this central complex and at Marca. We lack systematic data to determine the frequency of rectangular structures in patio groups at Marca, but a rough estimate may be 10–15% of the site's

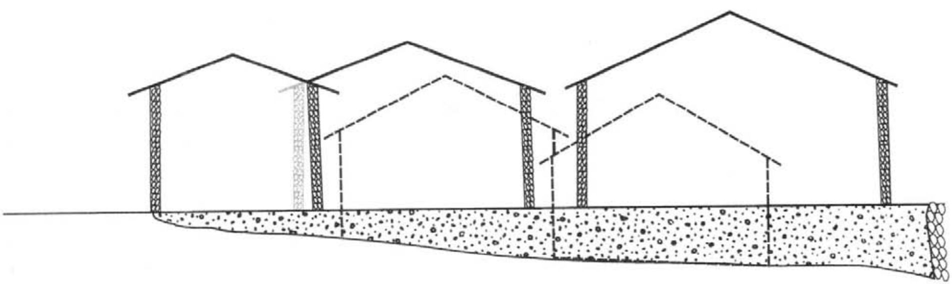

Figure 6.15. Sectional drawing of the remodeling of patio group J2=1. During Wanka III, the original Wanka II structures (shown here by dashed lines) were removed, the entire surface was raised and leveled, and the new structures (shown by the solid lines) were built, enlarging and expanding this centrally located residence.

Figure 6.16. Photo of niches in the rectangular structure in J54=1

preserved structures. Some patio groups also have wall niches (Figures 6.16 and 6.17). Similarly, a number of elite patio groups at Hatunmarca included or adjoined rectangular structures. Because the rectangular floor plan was virtually absent from Wanka II sites, its introduction into residential architecture, usually in elite patio groups, suggests that the wall niches and rectangular plan were adopted by local elites as a means of communicating affiliation with the state. It would be instructive to confirm that rectangular buildings occur only in elite compounds; while our current evidence indicates that this may be the case, it is not yet possible to verify it.

The use of Inka architectural features, along with greater compound size and variation, suggests that visual display through architecture continued to be important in communicating household status during Wanka III. It is also tempting to argue that Inka features were used in the displays because status depended upon affiliation with the state. The excavated assemblages show that, in portable material culture, Inka ceramics and exotic goods controlled by the state were replacing local valuables as signs of status. Local elites continued to enjoy preferential access to luxury goods (Inka emblems and insignia, especially ceramics) under state control, while differential access to local valuables declined considerably (Earle *et al.,* 1987; Costin and Earle, 1989; Hastorf, 1990a), suggesting that local items were no longer effective signals of status.

While Inka features were being adopted in local residential architecture, Wanka II architectural signs of status also declined or disappeared from elite patio groups. Little evidence of fine masonry exists at Marca, and while it is present at Hatunmarca, it was less elaborate. Visual inspection of the masonry exteriors of patio groups at Marca indicates that, as a group, they received little additional investment. Masonry quality does not distinguish elite from commoner patio groups and, as expected, the limestone flake density

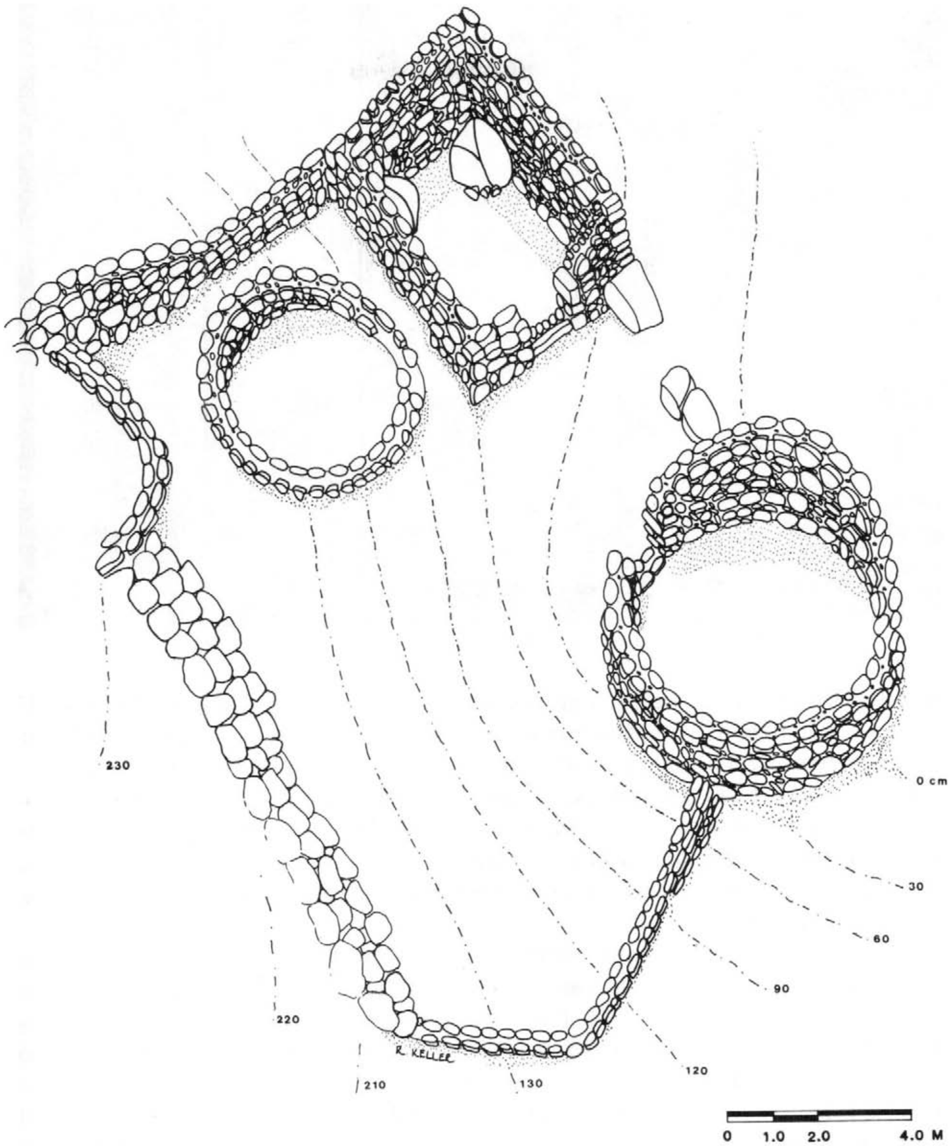

Figure 6.17. Drawing (by R. Keller) of excavated patio group J54=1, showing the incorporation of Inka rectangular design into a local residence at Marca (J54).

values are relatively low as well (Table 6.4). Flake density values for Marca fall within the range for Wanka II commoners (with the exception of one elite patio group, 54=1, which has high flake density values despite its average-quality masonry, perhaps the result of extensive terracing before its construction). In addition, low ratios of chinking stones to wall stones further suggest that labor investment in tine masonry exteriors declined considerably for the patio groups at Marca.

As suggested earlier, this decline in the quality of masonry may represent a shift to architectural symbols associated with the Inka, although researchers elsewhere in the Andes have noted that walls were sometimes plastered with mud (Kendall, 1985:52). In the Upper Mantaro, the evidence for plastering is inconclusive, but either way, it is clear that elites at Marca invested less in improving masonry than did their Wanka II elite predecessors. Because the overall labor investment values for patio groups at Marca do not distinguish elites from commoners, it is also possible that the elite inhabitants of Marca occupied a position in the local hierarchy distinct from that of their counterparts at Hatunmarca.

The labor investment patterns at Hatunmarca were more difficult to interpret because of its occupation during both Wanka II and III. Nevertheless, Hatunmarca's Wanka III architecture shows some of the same patterns described for Marca, while it retains other features more characteristic of Wanka 11. For example, patio group J2=1 had six roofed structures, like some of the Wanka II elite compounds. At the same time, both J2=1 and J2=3 had total compound areas that far exceeded the others in the excavated compound sample. The masonry data, including the ratio of chinking stones to wall stones and the flake densities for these patio groups (Table 6.4), suggest that some labor was invested to improve the exterior masonry, although this investment was lower than that of Wanka II elite patio groups. The implication is that traditional means of communicating status were not entirely abandoned with the advent of Inka rule, since Xauxa symbols of status were still used by some elites. Differences among local communities in the ways status was expressed and negotiated through architecture may also reflect changes in their ethnic makeup after the lnka resettlements.

These examples together indicate that Inka canons were adopted to varying degrees in different local settings. Their distribution also suggests that some aspects of Inka architecture that made its export to new territories relatively efficient also rendered it liable to imitation. Perhaps to counter the possibility of imitation, the public sectors and the largest elite compounds of Wanka III communities not only incorporated lnka symbols but also involved substantial labor investments. At Hatunmarca especially, the scale of labor and oversight necessary to dismantle Wanka II residences, level the area, and construct the oversized buildings of the central complex suggests state involvement.

These data suggest, overall, that the costs of architecture are essential to its meaning as a sign of power or authority, and that conspicuous consumption through architecture was an essential element in negotiating social and political relations during both time periods, albeit at markedly different scales. The visual displays associated with both Wanka II households and Inka sites and complexes within local communities indicate that part of their meaning lies in their demonstration of the capacity of builders to organize and expend resources. But another dimension of the message, perhaps more subtle, lies in restructuring settlement space to reflect social order or worldview. Thus, at Tunanmarca, elites congregated together in the high central sector, set apart from commoners, albeit by only indistinct boundaries. At Inka sites, reciprocity expressed in feasting redirected traditional Andean obligations between household and community leader, transferring loyalty to the state both symbolically and practically. The scale of architecture in this case may have been part of an effort to make the state's authority seem absolute and natural rather than contingent and socially prescribed to the individual households that made up its subject communities and attended the feasts.

CONCLUSIONS

The Wanka II period was characterized by crowded, nucleated settlements that appear to have been built rapidly, fortified, and largely unplanned. During this period, construction efforts largely went toward house construction, with comparatively little effort going into public buildings or planned layouts. Limited settlement space was devoted to public architecture or plazas; instead, political activities such as feasting appear to have been organized and carried out at the household level. The unroofed patio within each compound was a setting for a range of subsistence activities, and during Wanka II, elite households incorporated oversized patios to serve as the setting for this ceremonial hospitality. Beyond the household level, cooperative projects and ritual activity, as visible in the architectural remains, were modest in scale even at the regional center. Corporate projects, probably directed by elites, generally took the form of fortification walls, and warfare and related activities as a whole were probably coordinated by these elites.

The organizational structure of the household continued into the lnka period, although the scale of patio groups increased and grew more varied. This may have been due to the intensification of household activities to meet Inka tribute requirements, the easing of limitations on space that resulted from the relocation of Inka period settlements to lower elevations, or both. It also was in part probably tied to the continuing use of architectural forms and labor investments as a means to express status differences, which appear to have been amplified with the onset of lnka control and the integration of local elites into the state hierarchy.

This analysis has focused as well on architecture's social roles, examining the ways that architecture can influence behavior, social structure, and even worldview. I distinguished, based on Rapoport (1990), the instrumental and communicative roles of architecture and settlement organization. First, examining built forms as settings for activities, I considered how Wanka II households were organized in terms of the range of activities set within the patio group. I attempted to identify other levels of social organization that influenced the ways settlement space was laid out and concluded that since the public sectors of the settlements were relatively undifferentiated and elaborated, as well as small in scale, political activities largely centered in elite households, the site of ceremonial hospitality in Wanka II. The regional center, Tunanmarca, had the only formal public sector. Viewed as a setting, its modest complex could not have hosted civic or ceremonial activities involving a substantial proportion of the site's 10,000 (or more) inhabitants. Thus, the patio group was a significant locus both for daily subsistence and ceremonial activities, while elite patio groups were distinguished in their role as settings for feasts.

Examining the communicative aspects of Wanka II architecture revealed that status differences were also clearly expressed at the household level. Some elites, especially those at Tunanmarca, invested considerable labor to improve the quality of the exterior masonry, building larger compounds with more component structures, and expending more labor in construction. Such conspicuous consumption mirrors patterns visible in the assemblages of portable material culture, since elites had better access to costly ceramics, metals, and preferred foods. Importantly, all of the improvements in architecture involved labor expenditures, which implies efforts to exclude imitation by others. Therefore, the elaboration of architecture, because of its costs, demonstrated elites' greater control of labor and their capacity to organize and direct that labor toward political ends. Elites' limited capacity beyond the household to shape settlement layout can also be seen in the clustering of elite compounds in the most desirable locations of Tunanmarca. But this control did not extend to the creation of formal boundaries separating elite from commoner sectors or to the imposition of a plan on the settlement as a whole.

Examining Wanka III settlements, I considered architectural evidence for changes in the instrumental aspects of settlements, especially public sectors. While the organizational structure of the household continued into Wanka III, the dimensions of structures were larger, perhaps due to the intensification of weaving, food and *chicha* preparation, and other tasks in the domestic sphere to meet tribute demands imposed by the Inka. Yet the architectural evidence indicates that the household remained the basic economic unit of local communities under the Inka. In contrast, the public sectors of local settlements were expanded and remodeled (in the case of Hatunmarca), presumably for use as settings for administrative and ritual activities related to lnka rule. The placing of some elite compounds in the central sector of Hatunmarca next to public buildings suggests that association with the Inka set some local elites apart from their communities as they began to occupy positions of authority in an expanded hierarchy created by the Inka.

The communicative functions of Inka architecture have been widely documented. Its scale, layout, floor plans, and decorative features contributed to a distinctive canon that remains highly visible throughout the Andes today and must therefore have similarly demonstrated to pre-Hispanic ethnic groups the enormous capacity ofthe state to accomplish the expansionist goals of its emperors. While the efficiency of the Inka was expressed symbolically in the imperial infrastructure, its architecture and settlements also physically restructured the landscape. Through the relocation and resettlement of ethnic groups, the Inka imposed the imperial worldview on subjects and their public activities. At the same time, Xauxa households changed relatively little in their structure.

Chapter 7

Agricultural Production and Consumption

Christine A. Hastorf

Societies are a complex of actions, tensions, and interlocking systems. Some actions registered in the archaeological record reflect large cultural events, while others do not. Some of the important actions of the past barely turn up in the material record. We should try to use what material evidence we have to envision all of these aspects of the past. With an interest in how societies transform during political and economic restructuring, we must try to track a series of cultural dimensions to learn the extent of change in a society (Godelier, 1986; Ortiz, 1983; Sahlins, 1972). By analyzing data that illustrate economic and political relationships within an internally differentiated group that joined an expanding empire, we can learn about the form, structure, and extent of state power and how it affected people's daily lives and domestic activities (Yanagisako, 1979). In other words, how much did the state enter into the affairs of a group and, specifically, how much did it intervene in their local domestic economy?

During the development of political stratification, a group can experience many types of transformations. One may be able to observe some of these changes that are generated fromprevious structures (e.g. house form, use of space, patterns of deposition, resource use, exchange, production, political decision making, access, symbolic relationships, etc.; Bourdieu, 1977). With the development of new political manifestations, leaders begin to differentiate themselves from the rest of the group, either by making more decisions for the group (Flannery, 1972; Johnson, 1973), by organizing more group events, including war (Atkinson, 1989; Carneiro, 1970), or by accumulating more goods either for exchange, feasting, or display (Gamble, 1982; Meggitt, 1965; Rowlands, 1980). Families in this position need not necessarily accumulate objects but they may deal in them more regularly than other families, and therefore have evidence ofmore activity surrounding them(Sahlins, 1965; Strathem, 1971). These different strategies can be visualized at the locus of production and consumption in the domestic residence (Netting, Wilk, and Arnold, 1984).

With the incorporation of a group into a much larger political entity such as a state or empire, new forms of interactions will also occur. To understand how a state maintains its power, it is of interest to know the extent to which the state enters various domains, especially at the fundamental level of the domestic unit. The influence and form of state power in dealing with conquered people can vary greatly, but a key to success is the mobilization of economic resources (Collier, Rosaldo, and Wirth, 1982; D'Altroy, 1992; Sahlins, 1972; Wright, 1969).

There have been a series of models put forward to explain how the Inka conquest affected local economics (Collier *et al.,* 1982; D'Altroy, 1992; D'Altroy and Earle, 1985; Murra, 1982; Rowe, 1982; Ch. 1). One model of conquest is that the Inka ruled indirectly, promoting local leaders' management of their own people (hegemony). While all would participate in the labor organization that took place outside of the household, only those directly linked to the Inka administration would be most affected (Murra, 1982:245). This would, of course, differentiate the families linked to the state's management from those not so involved, leaving many families little affected beyond some extra labor. This is illustrated by a census made in Huánuco soon after the Spanish conquest, charting the effect of the Inka labor tax on local households (Ortiz de Zúñiga, 1967, 1972). It suggests direct involvement of the native lords in the mobilization of local labor, but only by removing labor temporarily from individual households. The conclusion made by Murra was that the Inka state's economy operated outside the domestic unit, with little or no effect on domestic production and consumption.

Murra (1982, 1984:68) stresses the retention of pre-Inka production systems by local groups, with the Inka's needs being met by adding structures, such as state *mit'a* labor obligations and the creation of outposts for extracting specialized products. In fact, with regard to the Andean household, which was the basic unit of taxation, Murra states "The diagnostic, all-important, Andean trait characterizing these [Inkaic] standards was that the larder of the peasant remain untouched" (1984:79).

Another model suggests that Inka state control broke up and dispersed the old powers and production organization, replacing them with new forms of leadership and economic behavior (the territory model; Wachtel, 1977). These more direct controls would have had a greater effect on the daily lives of the conquered people. These impacts include extraction of surplus products by the state as well as changes in local domestic production. Wachtel (1977:117; 1982) suggests that these effects include the direct taxation of native land as well as labor.

We know from documents and archaeology that within sixty years, the Inka organized a system of controlled extraction of resources stretching 4,000 km along the Andes (Rowe, 1946). In this vast area, the impact of the Inka on the local economic structures varied depending on the form of the conquest, the size of the conquered polity, the political structure of the conquered people, and their geographical location (D'Altroy, 1992). The Inka did reorganize certain conquered groups more than others, due to factors such as location in the empire, state needs at the time of conquest, and local resources (Julien, 1978; Morris, 1974; Murra, 1972, 1982; Netherly, 1978; Salomon, 1986). Some scholars who have studied Inka production, such as Rowe (1982), have discussed the major political effects and agricultural reorganization the Inka had at all levels of society, including the local production of the household.

By focusing on the domestic unit before and after the Inka conquest, I, too, examine the Inka's intervention in one group's agricultural production and consumption, hoping to provide new insights into the operation of native and state leadership and their impact on the domestic economy. Although many aspects of society may illustrate the impact of the state on local communities, I suggest that crop production and food consumption represent two very fundamental and visible axes of political and economic action. This is done by presenting information that reflects the Inka's impact on local production. To do this most directly, I discuss prehistoric crop remains from pre-Inka and Inkaic Xauxa sites.

There has been much debate concerning the validity of using paleoethnobotanical information to address questions of agricultural production and/or food consumption, well before Dennell(1976) outlined crop production, processing, and consumption stages, and their potential to be identified archaeologically. Paleoethnobotanists interpret plant material from excavated contexts as reflecting production and processing more often than consumption. In some societies there are differences in what is produced and consumed; produce can be exchanged, sold, or given as tribute. Differential consumption exists within families (food taboos, sequences of eating) and between different statuses (differential access by cultural right or resource access). In studying the economic changes of societies, we should try to differentiate production from consumption, when possible, to gain a closer perspective on group activities and values. Andean archaeologists, along with paleo-ethnobotanists, are beginning to have sufficient data to address issues of changing production and consumption in concrete and quantifiable ways, though much more and regular data must be analyzed and presented (cf. Moms, 1974; Pozorski, 1979).

THE XAUXA

The topographic boundaries of the northern Wanka group, the Xauxa, suggest that agriculture has been, as it is today, the major economic focus of the residents for the last several millennia. We know from the faunal, floral, and stable-isotope data that the residents relied primarily on agricultural crops for their sustenance from at least A.D. 200 on (Earle et al., 1987; Hastorf, 1993; Hastorf *et al.,* 1989; Lennstrom, 1992; Sandefur, 1988a). This is apparent from the crops and animals found in the excavations: maize *(Zea mays),* beans *(Lupinus mutabilis, Phaseolus vulgaris),* the pseudograin quinoa *(Chenopodium quinoa),* Andean tubers (potato: *Solanum tuberosum, S.juzepczukii; ulluco: Ullucus tuberosus; oca: Oxalis tuberosa; mashua: Tropaeolum tuberosum), maca (Lepidium meyenii),* deer *(Teruga* spp.), camelids *(Lama glama, Lama pacos),* guinea pig *(Cavia* cf. *porcellus),* and dog *(Canis familiaris).*

Although agricultural research in the region has spanned the Early Horizon (approximately 800 B.C.) through modem times (Earle *et al.,* 1980a; Hastorf, 1993; Lennstrom, 1992; Matos Mendieta, 1975; Mayer, 1979; Parsons, 1976, Parsons and Hasting, 1977; Parsons and Matos Mendieta, 1978), here I focus on the food production and agricultural patterns of people in two cultural phases: the autonomous yet differentiated Xauxa in Wanka II and the conquered Xauxa in Wanka III. Field research was conducted in 1979, 1982, and 1983 (Chapter 2, this volume). Material excavated from 31 domestic compounds allow us to study the effects of the Inka conquest on the local Xauxa domestic economy. I first outline the relative changes in crop production in the domestic compounds between the two temporal phases, and second between the two identified economic–political statuses, ''commoner'' and "elite" by phase. Then I discuss the evidence of changing consumption between the two phases and the two statuses by presenting some stable-isotope data from excavated skeletal remains. To gain a better perspective of the autonomous development as compared to the conquered situation of Wanka III, I also include production data from the previous Wanka I phase (ca. A.D. 1000–1300)(Hastorf, 1989).

THE STUDY REGION

The Xauxa have lived for centuries in the intermontane region of the modem Junín province in the central sierra of Peru, about 250 km east from Lima (Figure 2.1). The Mantaro River Valley (3,470 m) is one of the major Andean valleys in the topographically diverse highlands, offering slightly more than normal arable land (Chapter 3, this volume). My regional study of the traditional agricultural practices has permitted definition of five land-use zones based on topography, microclimate (moisture and temperature), elevation, soils, and modem production regimes. Each zone has a different potential growing season and range of optimal crop frequencies (Hastorf, 1990b; Mayer, 1979):

1. The Mantaro Valley floor (3,100–3,400m) comprises low alluvial benches overlain by fans from tributary streams. The soils are deep, often stony, and quite fertile. The zone has a mild climate, seldom losing crops to frost. Maize is regularly produced here.
2. A series of small valleys and narrow *quebradas* surround the northern end of the Mantaro Valley, like fingers, at elevations ranging from 3,450 to 3,600 m. These valleys have periodic frost problems caused by cold-air drainage off the surrounding hillsides. Today, some maize is grown but mainly *quinoa,* legumes, tubers, and European vegetables.
3. The hill slopes (3,400–3,700m) surrounding all of the valleys are suitable for the full range of Andean tubers, with small amounts of legumes and *quinoa.*
4. To the east, the hill slopes rise up continuously to the glaciated *Cordillera Blanca* and are not used for agriculture at all, but for herding and collecting. To the north and west of the valleys, the topography flattens out into a rolling upland zone (3,600–3,900m), where rain-fed agriculture is dominated by tubers. Some *quinoa* and legumes also grow here. These conditions require a fallow cycle as long as 8 years, making it less productive than the hill slopes or valleys.
5. Above the uplands is the highest land-use zone of the region, the *puna* (3,900–4,200 m), which is used primarily for grazing.

THE XAUXA SETTLEMENT PATTERN AND POLITICS

Before the Wanka sequence, during the local Formative Cochachongos (approximately 900-200 B.C.) and Huacrapukio I (approximately 200 B.C.–A.D. 900) phases, internal social changes were under way. The few identified settlements are on hillsides, evenly distributed about the whole region. There is evidence for Formative–Cochachongos “temple complexes” that are also evident in other parts of the Andes during the Early Horizon, although as yet unexplored in the Xauxa area except for Ataura. There is ceramic evidence for Chavin–Cupisnique affiliations, but we do not know what further links were present. Huacrapukio sites are clustered low in the Yanamarca Valley to the northwest. Settlements continue to be located on low ridges and hill slopes overlooking the valley floor over time. There is no evidence for direct Wari incursions in this northern region. At the end of the Middle Horizon, with the beginning of the Wanka sequence sometime between A.D. 900 and 1000, the population began changing both its settlement locations and other cultural attributes (Borges, 1988; Hastorf *et al.,* 1989), marked by a change in ceramic shape, decoration, and settlement formation (Earle *et al.,* 1980a; LeCount, 1987; Parsons, 1976). The cause for these changes around A.D. 900 is not yet understood, but the new complex of traits continues throughout the rest of the prehistoric record. There seem to have been some major realignments of shifting trade and alliances throughout the Andes. The Xauxa were affected by these major upheavals but, thus far, the effects seem to have been indirect.

In the early part of the Wanka sequence, the Wanka I phase, settlements were further concentrated the Yanamarca Valley, with site clusters also located in the Mantaro Valley to the south and east. New settlements were built upslope off the valley floors. The sites were slightly bigger and the domestic compounds seem to have been more densely packed than previously. Production evidence suggests that fewer sites were producing pottery and discrete spheres of exchange were more evident than before (Hastorf *et al.,* 1989). Evidence of more intensive agricultural production is seen in a marked increase in the frequencies of digging hoes used for crops (from 5% to 55 % presence; Russell, 1988:Figure 2). All crops were present before. The botanical evidence indicates a focus on the valley floor agricultural lands, where maize can grow. This is seen at the small valley-edge site (Pancan), which has a series of new varieties of maize that entered the record at this time (Johannessen and Hastorf, 1989).

The Wanka I movement up out of the valleys was transfigured around 1300–1350, when the people moved totally and quite rapidly out of the valley and lower knoll sites onto rocky defensive hilltops in the western upland zone, several hundred meters above the valleys (Figure 2.5). Many of these sites are some distance away from the tributary valleys. In the northwestern comer of the Xauxa region, 34 sites aggregated into 10 sites in Wanka II. Along with an increase in site size, there is clear evidence of a site hierarchy, with two centers, 25 and 74 ha in size, respectively. Previously, the largest Wanka I site was 16 ha. Intersite trade alliances are evident by spatially discrete distributions of certain decorated ceramics in the smaller sites located around these two major centers (LeBlanc, 1981). The northern alliance of sites, with its center at Tunanmarca, is also linked by an irrigation canal that delivered water to each of the smaller sites (Hastorf, 1983; Parsons, 1978).

This shift in settlement location impacted Xauxa agricultural production. One important outcome of this upward relocation was the increased distance to the maize fields of the tributary valleys and the Mantaro Valley to the south. Further affecting agriculture was a contemporaneous cooling trend at its maximum, somewhere around A.D. 1275, based on paleoclimatic evidence (Seltzer, 1987; Seltzer and Hastorf, 1990).

This settlement pattern development suggests that a political agenda was in operation throughout Wanka times. Especially in the Wanka I phase, intersite alliances and exchange networks were restricted, culminating in the local drive to relocate the population during the Wanka II. This is when we are seeing emergent "elites," who gained more of everything, especially the emblems of status: silver, nonlocal pottery, cloth, and higher-quality foods (maize and meat; Costin and Earle, 1989; Earle *et al.,* 1987; Hastorf, 1991). The effects of this population relocation are seen in the distribution of crop taxa from the excavated Wanka II domestic compounds. Accompanying this spatial relocation, the aggregation had to intensify the population's labor output as larger populations lived in fewer locations, increasing transport time to the fields. Although the Wanka II population was closer to the puna grazing lands, where the camelids resided, there is no faunal evidence that the Wanka II diet was higher in meat consumption than the previous Wanka I diet (Chapter 8, this volume). In fact, the faunal evidence suggests that it is in the next phase, after the Inka conquest, that the Xauxa diet had more meat (Sandefur, 1988a).

The Wanka III phase only lasted for about 100 years, beginning with the Inka's arrival around 1430. This phase ended with the next conquest, when the Spanish founded Jauja, in 1535, as their first capital. As with most military conquests, the effect of the Inka is visible in a new settlement pattern. The Xauxa population was disaggregated into 30 smaller settlements, relocated in and around the valleys (Figure 2.6). Only one of the Wanka II centers, Hatunmarca, remained occupied in Wanka III times, but with a much smaller population, the area shrinking from 74 to 27 ha. (Earle *et al.,* 1987).

POSSIBLE EFFECTS OF THE INKA ON THE DOMESTIC ECONOMY

Although the Inka left much of the Xauxa domestic life intact, they seem to have also had some major effects on it. The Wanka III settlement pattern is not very different from the earlier Wanka I phase with many Wanka I sites reoccupied. What motivated this change in settlement pattern? Historical documents suggest that the Inka wanted to break up the native power bases located in the knolltop citadels and disperse the local population into smaller, more manageable units. Besides these resettlements, we know that portions of the Wanka were relocated elsewhere in the north half of the empire to work as *yanakuna* and *mitmaqkuna,* further suggesting a desire to break up the earlier political organization (D'Altroy, 1992; Espinoza Soriano, 1969,1971; Murra, 1980).

The valley orientation of Wanka III settlements suggests increased interest in warm valley crops, especially maize production for state, ritual, and social interactions. Evidence of state-organized production is seen in the Inka creation of small hamlets in specific production zones, such as near mines, *puna* herding stations, and small hamlets in the highly productive sections along the edge of valleys. These sites suggest a regional focus on agriculture, transport (llamas), wool (cloth), and metal. Such economic foci occurred elsewhere in the empire (Wachtel, 1982). We also know of Inka interests in other specialized production settlements in the eastern slopes of the Andes and along the coast (Murra, 1980). These specialized settlements, however, did not have to have an impact on the inhabitants of the region. However, the new local settlement pattern lends support to the model that state interests redirected the local domestic economy. Cloth, metal, and maize (beer) are all well documented as important valuables, often given as gifts for allegiance and in payment for work done for the state (Murra, 1960, 1980; Rowe, 1946).

Relocation could also have been initiated by the inhabitants. Because they had been living closer to the valleys for at least a millennium, up until 1300, they, too, may have wanted to move from the more constrained, harsh conditions of the knolltops, now possible with the imposed peace of the larger political authority. Some support for a Xauxa initiated move comes from the fact that the Wanka III Xauxa diet was "better" than the Wanka II local diet (Earle *et al.,* 1987; Hastorf, 1991; Hastorf and Johannessen, 1993; Sandefur, 1988a). A better diet in this case meant more meat (increased density of camelid bones in the domestic compounds and higher stable-isotope nitrogen values, or higher trophic level consumption) and more maize (increased carbon 4 [C4] plant consumption seen in the stable-isotope analysis, as well as increased density of maize kernels in the domestic compounds, see below).

The question remains about the overall economic shifts of the majority of the local population as well as the political pressures of the Inka domination. How much was domestic production affected by the actions of the Inka? Was the impact restricted to specialized economic interests and the imposition of a labor tax, as Murra suggests, or was there wider state influence on familyproduction? Did the imperial presence enter each and every household's daily decisions about food cooked and animals grazed? The data presented below suggest the latter—a stronger and broader effect on the Xauxa household economies by the Inka.

THE PALEOETHNOBOTANICAL DATA

We now turn to the botanical materials that were excavated from domestic compounds in order to examine the political effects on agricultural production. Some very striking patterns exist in the data, reflecting changes in production orientation as well as differential use of certain crops. Although the patterns summarized reflect many different cultural influences and events, for the purposes of this presentation, I interpret the patterns in light of the broad political effects brought about by the Inka conquest. To do this, I assume that when taken as a complete data set, the macrobotanical remains reflect agricultural production, not consumption (Dennell, 1976; Hastorf, 1988).

Our primary goal in the 1982 and 1983 excavations was to collect artifacts from identifiable contexts in these two cultural phases. The sampling unit was the domestic residential compound (also called a household, patio, or family unit), a space where all or part of a small group lived and worked together on daily tasks (Figure 6.3). Each compound comprises one or more stone-built circular structures ranging 3–5 m across. The circular structures open onto an enclosed patio area surrounded by stone walls. The later Wanka compounds are quite tightly packed, so that two compounds may share the same patio wall, with all patios linked by curving walled paths.

Domestic compounds are made up of structures and patio space. Within each excavation provenience (approximately 1.5 x 1.5 m), we excavated a series of culturally determined levels and loci defined by soil changes, location, and spatially distinct features. We collected bulk, point provenienced soil samples that were processed in a standardized manner.

Archaeobotanical Methods

From the excavations, we collected, floated, and analyzed almost 1,000 soil samples from 828 proveniences. Per provenience, we collected one 6 kg sample that was collected in bulk without separation of any objects. The soil was from discrete point-provenienced locations, This type of soil flotation collection is called *point* or *bulk sampling* (Pearsall, 1989; Popper and Hastorf, 1988). This procedure allows concise interpretation of specific locations and activities, but it tends not to give such a diverse range of taxa as is obtained with other collection techniques, such as the scatter method (Popper and Hastorf, 1988).

The botanical remains were removed by use of a mechanized water-flotation system called the SMAP (Shell Midden Archaeological Project) system (described by Watson 1976), built by Anabel Ford and modified in 1982 by myself. A water pump poured water up and out of the 55-gallon drum holding the sample in an inner basin. Geological screens of 0.5 and 6.35 mm mesh retrieved the plant remains, which were transferred to a fine chiffon mesh by a water spray. The heavy fraction was caught by a 2.0 mm mesh. The botanical samples were shipped to the Archaeobotany Laboratory at the University of Minnesota, where they were systematically sorted and identified with reference to an Andean plant collection.

Paleoethnobotanical Analysis

In order to interpret the data culturally, numerical analysis must transform raw counts of macrobotanical remains to some form of quantitative or qualitative measurement. Raw counts do not directly reflect past human actions. We know, additionally, that the raw counts are biased by different sample sizes, differential preservation, taphonomy, soil conditions, and the ages of compared data. These variables must be controlled for, if at all possible. To make botanical data comparable, some form of transformation must be accomplished. Although no single method is suitable for every research question, some methods are more informative than others. I use three analyses for this inquiry, transforming the botanical counts by percentage presence or ubiquity, standardized density, and relative taxa percentage. Each analysis presents a different view to gain a better sense of the complex data set. A word of caution should be added concerning the effects of differential preservation between the different plant taxa, since each taxon has a unique potential for survival. Small, hard *quinoa* seeds get hidden in many contexts and will generally survive better through time, whereas soft, fleshy tuberous matter will be trampled and more often decompose and become difficult to identify. These preservation effects create very different counts and densities among taxa. Because the differences are sometime difficult to account for, densities are best compared by specific taxon, not among taxa, and relative taxon percentage should only be used where the taphonomic conditions are similar.

Percentage presence is appropriate for viewing broad trends in botanical data, with an emphasis on overall distribution (spread) across a population of samples. This analysis emphasizes the most common taxa(Hubbard, 1975; Popper, 1988; Willcox, 1974). Ubiquity tallies the number of samples analyzed in which a plant taxon is present. A plant taxon is counted as present whether the sample in question contains 1 or 100 specimens. Ubiquity values are thus the percentage of samples that contain a particular taxon. This form of data presentation avoids the differential preservation of plant matter by making each taxon ubiquity independent of all others, thus allowing for intersite comparisons. In this study, my taxa counts are averages of all flotation samples collected in each provenience, controlling for loci that had more than one sample.

Standardized density analysis presents the archaeobotanical data in a ratio form (Miller, 1988). The density value is calculated by the quantity of a taxon within a certain volume of soil. I include this analysis because it gives the distribution of the plants, showing the clustering of taxa among contexts and phases. There are obvious problems with this analysis when comparing the results from different sites and plant taxa. My justification for presenting this analysis here is that all of the samples are from the same 250-year time span in the same region. The preservation situation is similar for all samples, since they come from the same region with similar conditions and were all collected and processed in the same manner. The counts from each sample were standardized to 6 kg of soil, making them comparable by both provenience and percentage presence analysis. In general, a density value reflects relative density across or between sites, providing evidence for activities such as processing, storage, or refuse disposal. Like the percentage presence analysis, changes in values between locations or times could be due to differential depositional practices.

To gain a better grounded picture of trends in taxa dominance over time, relative taxa percentage calculates the relative amount of each taxon vis-à-vis all other taxa frequencies within any one sample (Popper, 1988; Renfrew, 1973:27). In this way, taxa are interdependent within each sample; for this reason, this analysis should be used in fairly well-controlled circumstances. This analysis assumes that preservation is the same for all taxa, which is never true, but comparing the percentages of the same taxa across time or space can help dampen different preservation biases. I use it here expressly to compare the relative change of specific taxa, especially maize andpotatoes, from successive time periods. When maize increases, potatoes decrease, as they might in individual production schemes.

I periodically compare these data to the earlier Wanka I phase data to gain a richer comparative view. These samples were collected in 1979 (for collection details, see Hastorf, 1993), using a manual oil drum flotation system to extract the botanical remains (Minnis and LeBlanc, 1976; Pearsall, 1989), and analyzed at the UCLA Archaeobotanical Laboratory.

EVIDENCE OF AGRICULTURAL PRODUCTION

Agricultural production predictions and archaeobotanical results are first discussed in terms of the settlement pattern shifts between the three successive time periods that cover the political changes in Wanka I, II, and III. The ubiquity, the density data, and the relative taxa presence by Wanka II and III phase are presented in Table 7.1 and Figures 7.1–7.3. When concentrating on the land-use potentials within 4 km of the sites, we can predict that maize would decrease in frequency, density, and relative presence with the move upslope during Wanka II, and then increase with the move down, closer to maize-growing lands in Wanka II (Hastorf, 1990b). Given that *quinoa* can grow in both zones, although it is more often grown in the valleys today, its presence should change only slightly. Potatoes and legumes both produce best on the hillsides, which are located near all sites. In Wanka 11, tubers should increase in abundance, for they would have been the main crop grown nearest to the upland sites, and then decrease slightly in Wanka III. Their abundance is not very predictable, however, because they are a staple food and can grow everywhere, but they should decrease in relative terms. In terms of densities, one might predict that with the move into more restricted quarters in the Wanka II sites, the processing, storage, and refuse dumping should become more clustered and confined, increasing the densities of all crops. The relative percentage should track the relative importance of maize and potatoes in the three time periods, with maize decreasing and then increasing.

The ubiquity analysis (Table 7.1, Figure 7.1) shows that maize, *quinoa,* and potatoes generally reflect the settlement pattern shift in Wanka II. The maize and *quinoa* ubiquities show a marked decrease from Wanka I to Wanka II, with an increase from Wanka II to Wanka III, following the predictions from the settlement shifts. Potatoes and legumes decrease steadily over time, although the decrease in the potato presence is not as marked as is the legume decline. The legume ubiquities decrease most in Wanka II times, remaining the same in the Wanka III phase. This reflects its marginal position in the late prehistoric

Table 7.1. Ubiquity, Density, and Relative Percentage of the Four Major Food Crops: All Proveniences Weighed Equally by Phase

Phase	No.	*Zea mays*	*Solanum* spp.	*Chenopodium*	Legumes
Ubiquity					
Wanka I	44	42	27	80	40
Wanka II	499	27	23	54	10
Wanka III	329	63	17	63	07
Standardized density					
Wanka I	44	2.1	2.1	17.5	2.8
Wanka II	499	17.0	5.6	43.0	1.1
Wanka III	329	17.0	1.2	11.0	0.18
Relative taxa percentage					
Wanka I	44	4.3	3.2	14.0	6.4
Wanka II	499	3.5	3.0	16.0	1.0
Wanka III	329	9.3	1.0	11.0	0.6

diet. The data suggest that with the valley relocation in the Inka period, legumes are not reemphasized in the cropping cycle while *quinoa* and especially maize are reemphasized.

The density data show a slightly different picture that supports the predictions (Figure 7.2). At first glance, contrary to the presence data and the land-use predictions, the density of maize increases steadily into Wanka II and remains high. This is not as contradictory as it might look, however. The ubiquity and density data together suggest that although maize occurs in fewer places in the Wanka II residences, when it does occur, it is denser than in the earlier sites. This reflects perhaps increased restriction and storage ofmaize during these times, but the residents focused more on maize when it was accessible. Furthermore, in the Wanka III residences, maize is not only present more often than all crops other than *quinoa,* as it is also more densely deposited. Such a maize distribution reflects increased production or storage like *quinoa,* but also an increase in use or deposition unlike *quinoa.* The density of *quinoa* increases substantially with the move upslope but drops again with the return to the valleys. In Wanka I and Wanka II phases, potatoes increase in density, suggesting that they remained an important part of the production scheme. With Wanka III, we see a drop both in their densities and overall abundance. This supports the prediction that potatoes became less frequently produced during Inka rule. The relative taxa percentage parallels the ubiquity bar chart (Figure 7.3). Maize drops slightly from Wanka I to Wanka II but then doubles in importance, becoming a dominant crop in Wanka III. Both potatoes and legumes

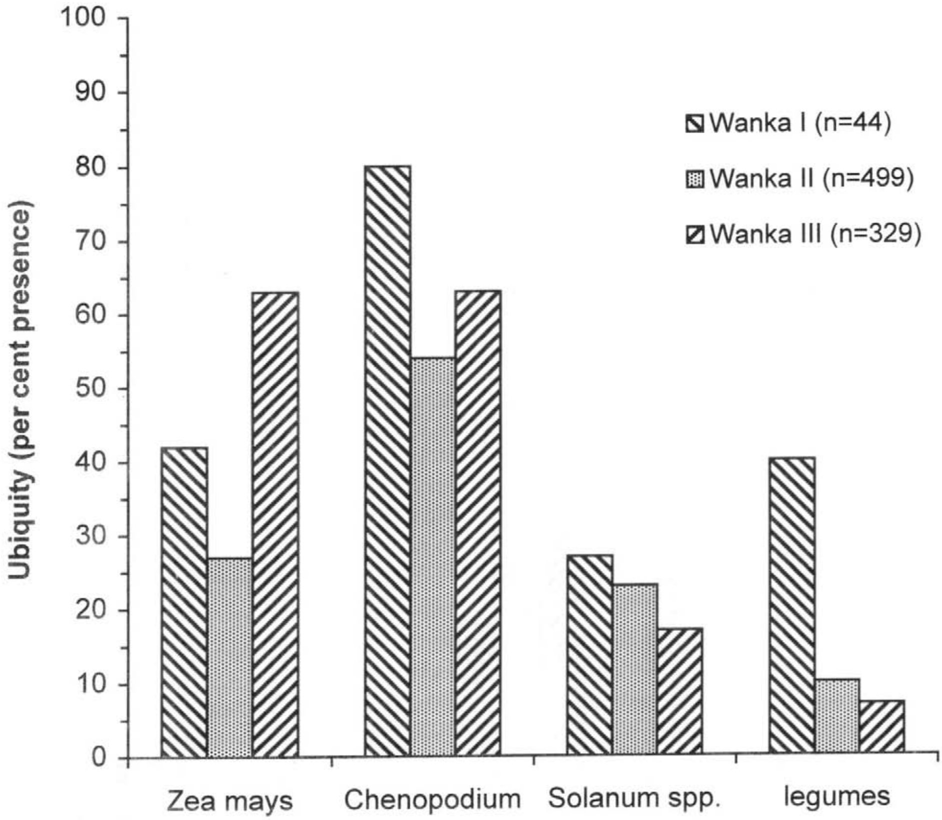

Figure 7.1. Ubiquities of the four main food crop groups in the Wanka I, Wanka II, and Wanka III Periods.

drop steadily in importance, with *Chenopodium (quinoa)* fluctuating while remaining an important crop.

I interpret part of the change in maize, potatoes, and *quinoa* frequencies between Wanka II and III to be a result of the territorial reorientation away from the frostier upland tuber-growing areas toward the warmer valley lands. The increase in maize density, presence, and ubiquity seen in comparing Wanka II to Wanka III samples, however, is not simply a product of site location. If it were, then the Wanka III maize ubiquity should be similar to the Wanka I frequency, for the settlement locations are very similar. The political effects of the Inka on local crop production, including what gets into the Xauxa home, is seen in this increased presence of Wanka III maize when compared to the Wanka I maize.

The Wanka III agricultural production has a new focus on more maize with less tubers and legumes, supporting the chroniclers' recording of the Inkas' interest in maize. These Wanka III data, however, are not from the Inka storehouses but from local residences. This shift from 40% presence in Wanka I to 25% in Wanka II, and finally to 70% in Wanka 111, is so large as to strongly suggest that the increase could not be attributed to local land use alone. This shift in crop production could be because there were either many more state fields of maize being planted, providing more maize in the region for all to have, or the local

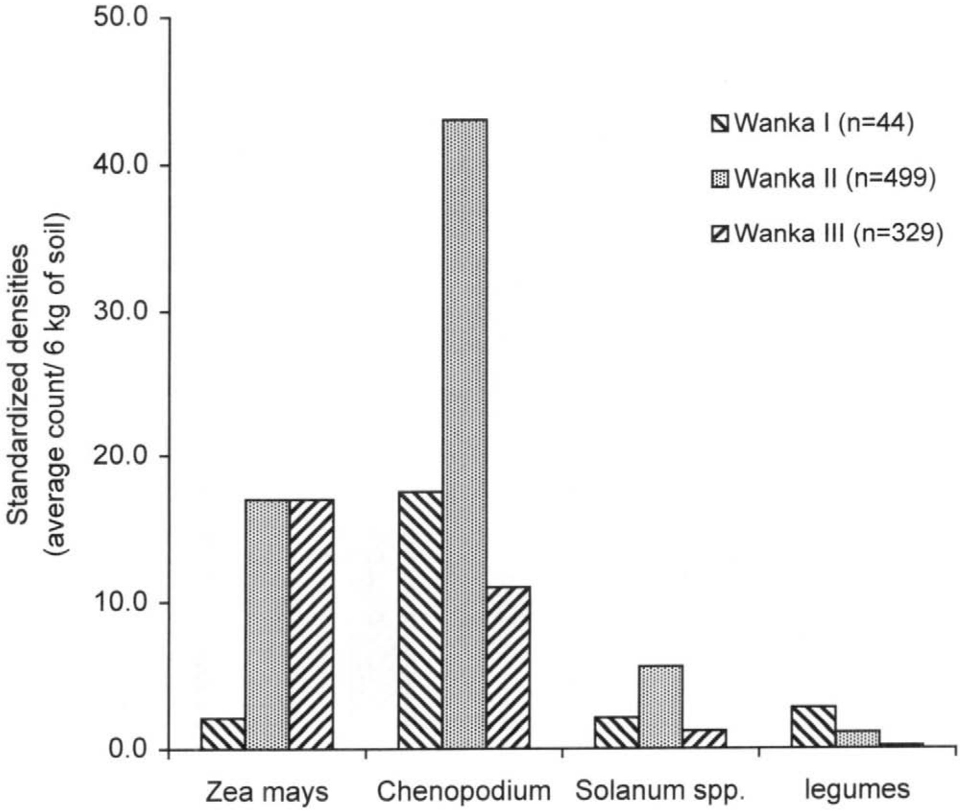

Figure 7.2. Standardized densities of the four main food crop groups in the Wanka I, Wanka II, and Wanka III Periods.

inhabitants were encouraged by the Inka to plant and harvest maize as part of their tax. Or, as the alternative relocation model suggests, the natives might have planted more maize for their own purposes and had the opportunity to do so after the Wanka II political structures were realigned.

Regardless of how many of these political and economic domestic strategies were operating to increase the maize at Wanka III sites, all suggest an Inka effect on local staple agricultural production. So when posing the general question again about the change in agricultural production of maize, we can now take a more political stance. How much of this increase can be attributed to Inka effects on domestic activities, and how much was spurred on by local political interest? This very large increase from 25% to 70% suggests that the first alternative is operating. The Inka not only had a hand in the Xauxa household decision making but also affected daily practice in food consumption (cooking and menus). This is seen clearly in Hastorf and Johannessen's (1993) report showing evidence for increases in chicha processing, especially the elite compounds.

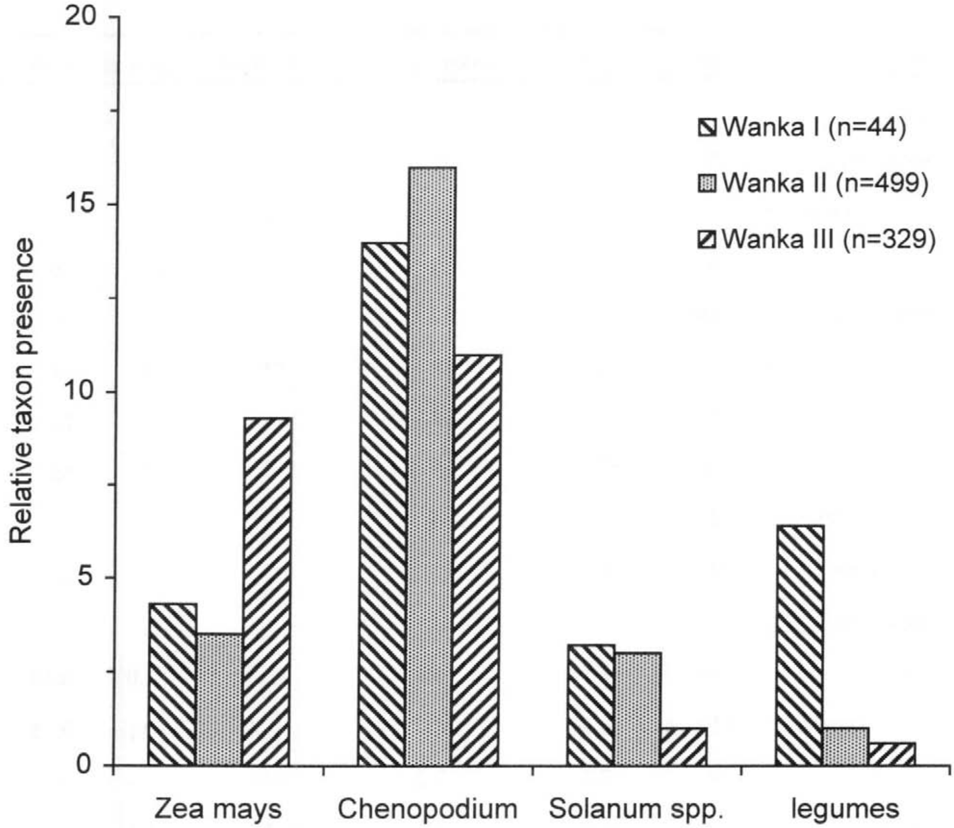

Figure 7.3. Relative taxa presence of the four main food-crop groups in the Wanka I, Wanka II, and Wanka III Periods.

Wanka II Production

The cultural dynamics of this staple production issue can be examined more fully by focusing on individual phases, first on the Wanka II data, and then on the more specific effects of Inka finance on staple production. Table 7.2 presents the Wanka II ubiquity and standardized density data by site and status. The ubiquity bar chart in Figure 7.4 is created from the first section of this table, presenting the Wanka II flotation data by site and status. If we assume that at least two economic statuses existed in Xauxa society, they should reflect differential access to the land that yielded the crops, to movement of crops as tribute payment, as well as access to other avenues for receipt of crops.

Table 7.2 Wanka II Ubiquity and Standardized Density of Four Major Food Crops: All Proveniences Weighed Equally by Site and Status

Site	Status	No.	*Zea Mays*	*Solanum* spp.	*Chenopodium*	Legumes	Cob
Ubiquity							
Tunanmarca		299	15	18	44	9	8
	Commoner	97	8	10	26	1	5
	Elite	202	18	22	52	13	10
Umpamalca		160	42	37	67	12	18
	Commoner	73	31	18	53	5	14
	Elite	87	51	52	79	17	22
Hatunmarca		40	57	10	75	5	55
	Commoner	12	17	0	42	0	8
	Elite	24	79	17	96	8	75
Standardized Density							
Tunanmarca		326	1.5	5.6	32.5	1.0	0.33
	Commoner	119	0.27	2.7	1.4	0.1	0.15
	Elite	207	2.2	7.2	50.2	1.5	0.4
Umpamalca		216	36.4	7.1	342.2	1.3	0.6
	Commoner	129	1.4	6.3	495.8	0.5	0.5
	Elite	87	88.3	8.4	114.4	2.6	0.6
Hatunmarca		36	3.3	0.7	16.7	0.6	2.7
	Commoner	12	0.58	0	2.1	0	0.1
	Elite	24	5.1	1.2	26.7	0.1	3.5

A general trend seen especially in the ubiquity data of Figure 7.4 is the greater presence of crop remains in the "elite" patio compounds in contrast to the "commoner" compounds. These same elite compounds also have denser crop remains. The ubiquity results illustrate this difference, particularly in the maize distributions. At Hatunmarca, the closest site to the lower elevation Mantaro Valley, maize is in 79% of the elite samples but only 17% of the commoner samples. Hatunmarca also is the southern Xauxa alliance center, suggesting that the residents may have had more access to or control of distant fields, trade, or tribute with the southern Wanka.

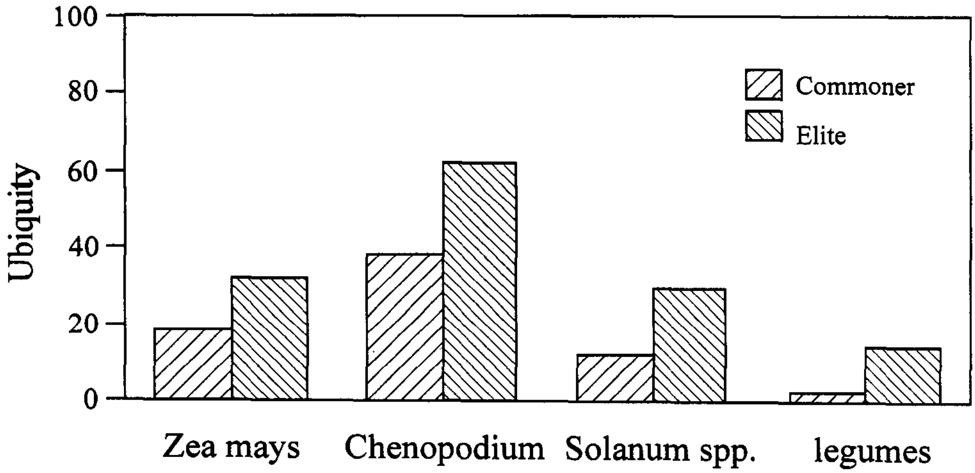

Figure 7.4. Wanka II ubiquities of the four main food crops by site and status.

In the northern alliance, we see that Umpamalca, which might be a maize-producing site due to its location next to a small, protected gorge and direct access to the lower Mantaro Gorge, has much greater quantities of maize even in the commoner patios than does its center, Tunanmarca, with 51% versus 18% maize presence among the elites, respectively, and 3 1% versus 8% maize, respectively, among the commoners. Tunanmarca is farthest from the maize-growing areas and probably depended on trade or tribute only. This restricted production of maize is supported by the maize cob data listed in Table 7.2, for shelled maize is often traded. Hatunmarca has a 55% maize cob presence, with 57% total maize presence, suggesting that the people harvested and processed much of their own maize. Umpamalca is next, with 18% cob presence and 42% total maize presence, and Tunanmarca, again, has almost no cob evidence, with only 8% presence (15% maize presence). Thus, it looks more like shucked maize was transported and that Tunanmarca residents did not do much of their own maize production.

Solanum potatoes show a difference between statuses but not as much as the maize data among the sites. With *quinoa* and legumes, the differences between elites and commoners are less marked. This suggests that although these crops were part of the production sequence, they were not so important in the differentiation of social, political, or economic position. They were the true staples of the Xauxa diet.

The greater focus on commodities by Wanka II elites is also borne out by the ceramic, lithic, metal, and faunal data (Costin, 1986; Costin and Earle, 1989; Costin and Russell, 1985; Earle and D'Altroy, 1989; Earle *et al.,* 1987). Elites had far more metal objects than commoners, especially decorative items, the Wanka II ubiquity of silver being 4.3 for elites and 0.8 for commoners (Owen, 1986:Table 6, also see Chapter 11, this volume, Table 11.1). Elites also had a higher density of camelid and guinea pig bone, with more food processing occurring in the patio areas, and double the density of spindle whorls, suggesting that they produced more cloth than commoners (Costin, 1984a). And the Wanka II elite patios show a higher density of nonlocal ceramic wares: decorated serving bowls and storage jars. The serving bowls suggest more food presentation and consumption. A much denser concentration of storage jar remains in the elite compounds reflects a greater frequency of crop storage and processing. Costin (Chapter 9, this volume) shows that the most common trade ware in the Wanka II Xauxa patios is an Andesite ware produced in the southern Mantaro Valley. These jars suggest a fairly intense exchange relationship with the southern Wanka, where maize was grown intensively, and the elites may even have received maize in these jars. The suggested status differences in access to these alliances outside the Xauxa sphere further support increased political negotiation by the elites. This might have been done as they attempted to broaden their political networks through extraregional exchanges, symbolically and materially separating themselves from the commoners with high-status exotics and foreign emulation (Helms, 1979). This parallels the increased production of commodities that could be given away in these exchanges, used in entertaining, or viewed as status symbols to gain prestige: metal, pottery, cloth, or maize as drink.

The denser crop remains in Wanka II elite compounds (Table 7.2), in conjunction with the overall increased quantity of all artifactual goods in these compounds, suggests greater activity levels in the elite sectors, perhaps due to more social interactions encouraged by heightened political networks among the people, more movement of goods through their compounds, more in-house production, larger families (including servants), and greater storage of goods.

Wanka III Production

We now look at the Inka's effect on the "elite" and "commoner" patios. Earlier, two models were proposed to explain the possible effects of the Inka on the Xauxa household agricultural production. They can be evaluated by examining Table 7.3 and Figure 7.5 for the Wanka III macrobotanical data by site and status, and can be compared with equivalent plots for Wanka II (Figure 7.4). The Wanka III elites had higher crop frequencies than commoners, but the difference between these two statuses is not as great as that seen in the Wanka II data. Wanka III commoners deposited more crop remains in their patios than their earlier counterparts, making these compounds look more like the elites. This suggests a leveling between the two statuses, dampening the expansive entrepreneurial actions of the elites or perhaps allowing more equitable crop access to all. The Inka economic intrusions must haveput a damper on the elites and their control over their *ayllu* populace, as they themselves siphoned off extra labor and yields.

Except for legumes, a marginal crop altogether, the crop ubiquities are similar between the two Wanka III sites as well. In this period, maize and *quinoa* are the dominant crops, frequent in many locations. Maize is very common in elite patios (80%), but it is also frequent in the commoner domestic compounds, averaging 50% presence (maize averaged 16% in the Wanka II commoner houses). *Quinoa* continues strongly in Wanka III. Overall, potatoes drop in frequency and density from Wanka II values, but not an equivalent drop in both statuses. Elite compounds have less potatoes. In fact, the Marca commoner patios have even more potato remains than their neighboring elite patios.

The historical literature suggests that, under Inka hegemony, maize was a crop of political interest, needed in state rituals and in labor payments, as well as having symbolic value (Murra, 1960). During Inka rule, maize probably was produced by the local inhabitants and harvested directly from their fields into their homes, as can be surmised from the high maize cob presence relative to maize presence at both sites. At Hatunmarca, cobs

Table 7.3. Wanka III Ubiquity and Density of Taxa Present of Four Major Food Crops: All Proveniences Weighed Equally by Site and Status

Site	Status	No.	*Zea Mays*	*Solanum* spp.	*Chenopodium*	Legumes	Cob
Ubiquity							
Hatunnmarca		167	74	20	72	8	62
	Commoner	39	53	8	55	0	37
	Elite	128	80	24	77	10	7
Marca		146	57	14	57	8	48
	Commoner	95	44	16	53	11	37
	Elite	51	79	12	63	2	7
Standardized Density							
Hatunnmarca		167	30.0	2.0	19.0	0.1	4.1
	Commoner	39	1.4	0.4	27.8	0	0.6
	Elite	128	38.5	2.5	16.0	0.2	5.1
Marca		146	4.7	0.4	2.2	0.2	2.6
	Commoner	95	1.9	0.3	1.7	0.3	1.2
	Elite	51	9.9	0.5	3.5	0.1	5.3

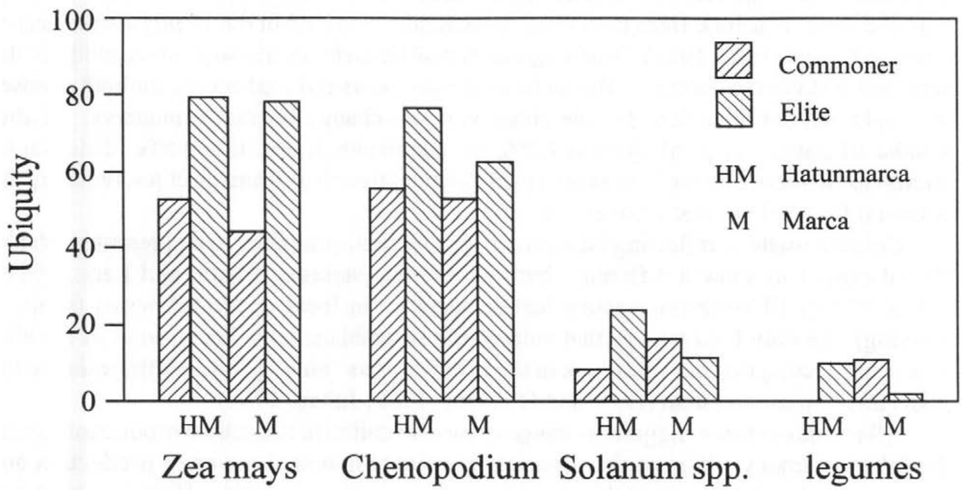

Figure 7.5. Wanka III ubiquities of the four main food crops by site and status.

are present in 62% of the samples (Table 7.3), whereas maize of any sort is present in 74% of the samples. This close relationship between cobs and maize is markedly different that that seen for cobs and maize in the Wanka II data (Table 7.2), where maize kernel presence is much greater than cob presence.

DISCUSSION

The botanical data in the Wanka III domestic contexts reflect agricultural activity not of the Inka but of the local people as it was affected both directly and indirectly by the Inka economic and political policies. The paleoethnobotanical results suggest that the Inka relocated people to arable lands, moved their living quarters, and encouraged different crop production, while the historical literature further tells us that the Inka expropriated lands for state production on state farms (La Lone, 1985). Both of these events could have been operating in the Xauxa region, with hints of an Inka farm in the Yanamarca Valley.

Although generalized subsistence production seems to have continued at Xauxa households, as reflected also by regular frequencies of lithic tools (Russell, 1988) and processing ceramics, there is evidence of Inka entry into the domestic economy, as seen in a series of production indices. Basically, the data suggest that the two statuses were slightly leveled in terms of access to the means of production and goods. This is especially seen in goods such as metal ornaments (Costin and Earle, 1989). Production increased for those items linked more directly to the Inka and required by them as tribute, such as foods and fire wood (Hastorf and Johannessen, 1989). In the Wanka II patios, we saw evidence of differences across the board between statuses for all valued products (metal, maize, meat, nonlocal ceramics, etc.), but in Wanka III this is not so.

Whorl density, indicative of spinning wool in the production of cloth, doubled from Wanka II to Wanka III, yet the difference in frequency per cubic meter is slight between the two statuses in Wanka III: 6.7 for commoners versus 7.3 for elites (Costin, 1984a). The Inka required cloth as tribute from individual households, as stated in the *visita* (inspection) of Ortiz de Zúñiga (1967, 1972). This suggests that all households had to produce cloth for the state, not just the commoners. The metal evidence shows reduced access for both statuses in Wanka III, down by 50% for the elites with less change for the commoners. In elite Wanka III patios, silver ubiquity is 2.2%; for commoner patios, it is 0.5%. This can be interpreted to mean that the Inka skimmed off more of the silver from the elites, reducing the potential for local circulation of silver.

Ceramic wasters, reflecting local pottery production, continued to be present in Wanka III but ceased to show a difference between the two statuses (Costin and Earle, 1989). While Wanka III commoner patios had an increase in local decorated wares (again, a leveling), the only Inka vessels that entered the assemblage have been found in the elite patios, suggesting that the elites took in the Inka wares as "elite" goods, participating in the Inka administration system (Earle and D'Altroy, 1989; Julien, 1982).

All of this evidence suggests a change in the orientation in household production during the Inka hegemony. We see the diminishing of elite potential for extra production and access, and a leveling between the two statuses in native communities. However, evidence exists for specific increased production of goods that the chroniclers mention as key items in the Inka staple finance: maize and cloth.

Returning to our two models of Inka intervention in the Xauxa household, the maize evidence in conjunction with the artifactual data support the first model of Inka impact (Rowe 1982)—that the Inka affected the household production of certain goods, not only through extrahousehold labor surplus tribute but also by intervening in the natives' own production. It does not so strongly support the elevation of the native leadership in Wanka III. It would be unusual if the local elites encouraged a leveling between the two statuses, It is much more likely that the elites would have been trying to retain their leadership position throughout the Inka rule, yet their power must have been curtailed by the Inka, who closely oversaw local politics from their nearby administrative center.

EVIDENCE OF CONSUMPTION

Was there also an effect on the Xauxa daily food as well as on agricultural production? Did they perhaps alter their production only for the state but not for their own use? In this section I present evidence of dietary consumption through a portion of the botanical data that most likely reflects consumption, although still removed from the act of eating. Then I turn to more direct evidence via stable isotope analysis of the skeletal remains.

Paleoethnobotanical Data

Although the botanical data set as a whole reflects production rather than consumption, very specific cultural contexts are likely to produce deposits more related to food consumption. Ethnographic and architectural studies in the area have shown that people lose portions of their meals through spilling in and around the hearths (Sikkink, 1988). Cooking hearths in the Andes are predominantly inside structures, as people sit around them to eat. For this reason, let us look only at the inside structure floor contexts as representing the possible consumption patterns within the botanical data.

The proveniences chosen for this query come from floors in both "elite" and "commoner"structures, and include 257 flotation samples. Table 7.4 presents these floor data by phase, site, and status. When compared to the overall botanical results, this evidence suggests that daily use of maize increased significantly in Wanka III but the remaining crops changed less. These floor frequencies have slightly lower ubiquities than the larger data set but parallel it overall.

Table 7.4 shows the effects of the site locations as well. Umpamalca has access to more maize than Tunanmarca, with commoner patio floors at Wanka II Hatunmarca having no maize at all. Unfortunately, Wanka II Hatunmarca, along with other tested Wanka III sites, did not have enough floor contexts to make a secure status comparison. Whereas the Wanka II elite floors have more of everything, this pattern is not seen in the Wanka III floor data. The remains of maize, potatoes, and quinoa at Wanka III Hatunmarca and Marca display a mixed picture of these three crops between the two statuses; the larger households had about the same amount of maize as the smaller ones, but less quinoa and a mix of tubers. Maize is much more common on the Wanka III house floors than in the Wanka II houses. These data support the proposition that during the Inka rule, the local political differences were slightly leveled, dampening wealth or its access between the statuses. Alternative interpretations are also possible for these results. One idea might be that people were tidier in the elite Wanka III structures than in the Wanka II times, or that these contexts really do not in any way reflect consumption. While both alternatives might be possible, the first is not supported by the other data sets, such as ceramics, lithics, or animal bone. The second alternative also is not supported by the stable isotope data.

Stable Isotope Data

The direct consumption data generated by stable carbon and nitrogen isotope analysis of bone collagen indicate crop access, dietary preference, as well as the effect of the Inka conquest on Xauxa life. Much research has been conducted over the past twenty years developing stable isotope analysis for use in prehistoric dietary studies (e.g., DeNiro, 1987; Ambrose, 1993; Pearsall, 1989; van der Merwe, 1982). Although methodological and technical problems remain, sufficient work has been completed to give confidence in these results.

Andean researchers are fortunate because the domesticated plants of the highlands metabolize their carbon by what is called a C3 pathway (Hatch-Slack). Tropical grasses and a few other families use a different pathway called a C4 pathway, and desert succulents use yet a different process called CAM (Crassulacean Acid Metabolism), which is isotopically similar to the C4 pathway. The body takes up these elements continuously through life, and the different isotopes of carbon are deposited in the body based on what is consumed. This occurs in all tissues, but in the harder matter, such as bone, isotopes are more permanently deposited. Once an animal is dead, these stable isotopes no longer exchange with the world around them. In this way the isotope value of bone reflects the different proportions of C3 and C4 plants ingested, once controlled for diagenesis.

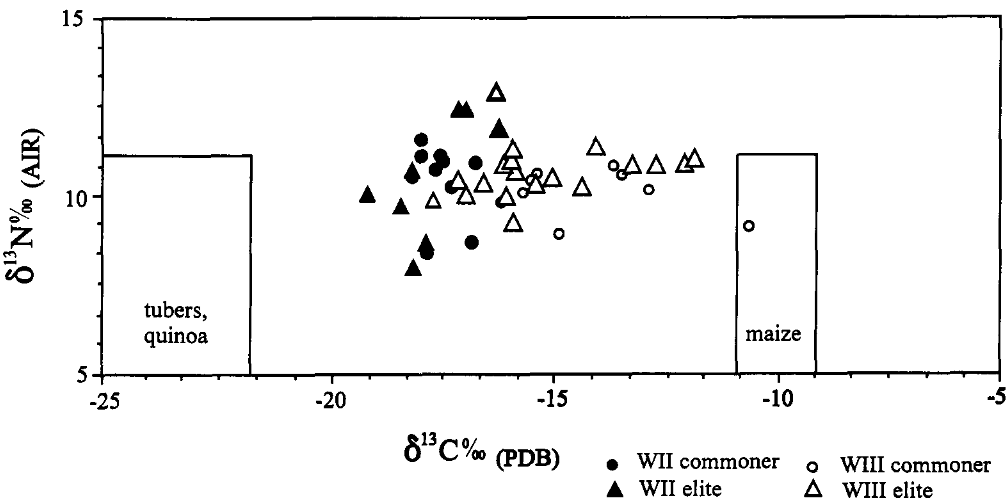

Figure 7.6. Wanka II and Wanka III carbon and nitrogen stable isotope values by phase and status.

To be able to interpret the isotope results, it is important to know the isotopic values of the potential diet. An array of plants has been analyzed for the Mantaro region (DeNiro and Hastorf, 1985). All local Andean domesticates are C3 plants, having values between -21 and –28 delta 13 C parts per mil. (The local animals also consume C3 plants, although some dogs also eat maize.) The only C4 plant in the pre-Hispanic Xauxa diet was maize, whose ancestors came from the dry Mesoamerican mountains. Its delta 13 C value is between -8.5 and -12 parts/mil. These carbon delta values are calculated with respect to a laboratory standard (PDB). The isotope value reflects the relative amount of each plant group consumed during life. The two pure dietary strategies, consuming only C3 or C4 foods, are noted on Figure 7.6 by boxes. With these divisions, we can study the amount of maize consumed versus other plants and animals, including potatoes, *quinoa,* legumes, camelids, guinea pig, and dog.

Table 7.4. Ubiquity of Four Major Food Crops from Floor Contexts by Phase, Site, and Status.

Site	Status	No.	*Zea mays*	*Solanum* spp.	*Chenopodium*	Legumes
Wanka II		174	24	26	55	12
<u>Tunanmarca</u>		122	18	25	51	14
	Commoner	36	8	17	31	0
	Elite	86	22	28	59	19
<u>Umpamalca</u>		44	43	33	70	10
	Commoner	28	43	25	66	13
	Elite	16	44	47	78	6
<u>Hatunmarca</u>		8	25	0	38	0
	Commoner	5	0	0	20	0
	Mixed	3	67	6	67	0
Wanka III		86	59	20	60	5
<u>Hatunmarca</u>		42	62	26	77	5
	Commoner	15	63	13	83	0
	Elite	27	62	33	74	7
Marta		39	64	15	49	5
	Commoner	25	60	20	52	8
	Elite	14	71	7	43	0

The vertical axis reflects the amount of different nitrogen isotopes consumed. According to a similar theory, nitrogen-fixing plants (legumes) take up their nitrogen from the air, having a delta value around zero. All non-nitrogen-fixing plants take up nitrogen through the roots, and their isotope values range between 8 and 11 parts/mil. In addition, the nitrogen axis reflects the consumption levels in the trophic chain, including terrestrial versus marine food. As one moves up through the trophic levels, herbivore to carnivore, the delta value of nitrogen increases (Schoeninger, DeNiro, and Tauber, 1983). In other words, the farther up the Y axis the values are, the more meat is consumed.

All the tables and figures that compare Wanka II and III botanical remains display increased maize production and processing through time. Does this also suggest the same in the diet of the people? Figure 7.6 displays the carbon and nitrogen stable isotope values by phase and status. A total of 47 skeletons were analyzed: 18 from Wanka II compounds, 29 from Wanka III. Only complete and primary context skeletons excavated from patios were included in this analysis (Owen and Norconk, cited in Earle *et al.,* 1987:107–123).

Overall, the Wanka diet mirrors the production shifts. The isotope data show that the Wanka III diet has more maize in it, with no significant shift in legume or meat consumption. This maize increase is statistically significant at the 5% level. As seen in most of the Wanka III skeletal samples, with an average of at least 3 parts/mil toward the pure maize diet box, the results show an increase in maize consumption relative to C3 tubers and *quinoa.* About one-third of the Wanka III sampled population, however, does not have a noticeably different diet from the Wanka II average (average C3 values). This suggests that this maize-enriched diet was not only a result of settlement relocation but was also politically induced, brought about by the Inka emphasis on maize production and access to maize-producing lands. The Wanka II vertical spread is much greater than Wanka III, with the Wanka III samples lying in the middle of the Wanka II spread. This suggests a leveling effect in the Wanka III meat diet, similar to what we saw in the Wanka III consumption of other goods. Once again, this evidence of leveling adds to the support of the model of Inka-induced dietary change.

No statistical difference in maize consumption exists between "commoner"and "elite" populations in either phase. The isotope results parallel the Wanka III botanical data more closely than they do that of Wanka 11. The Wanka II stable isotope data show only half the number of points (6 commoners and 12 elite burials) compared to the Wanka III (10 commoners and 19 elites), building a slightly stronger case for the lack of dietary difference between the Wanka III statuses. The stable isotope data suggest that the two statuses did not consume radically different diets in either Wanka phase, supported by the botanical data from the sampled floor contexts. There are marked differences between sexes, however, especially in the Wanka III phase, where some of the males consumed more maize than the rest of the population (Hastorf, 1991). Again, this reflects the actions of the Inka, pulling males out of their community at least periodically for military or labor service, feeding them maize beer *(chicha)* and meat.

If one assumes that the stable isotope data present the best reconstruction of the diet, then we must again stress caution when using the botanical data to discuss consumption. The stable isotope data do not parallel the production data completely. The production data suggest much more movement of foods through the patios, providing food beyond the consumption within the household.

CONCLUSIONS

We can learn much from macrobotanical and stable isotope data about prehistoric agricultural production, consumption, economics, and politics. It has been pointed out elsewhere that work organization and consumption patterns are linked to political and social organization (Douglas, 1962). Here we attempt to show that production and consumption data track political *and* economic change. In the Wanka II phase, we see production differences between the two designated status groups. Elites had more access to all goods of social value, including space, maize, *chicha* serving bowls, storage vessels, trade wares, and metal. Despite all of the drawbacks of the relocation onto knolltops, the two Xauxa political alliances we studied managed to gain privileged access to maize, whether through trade, tribute, or by their own production. While the production data suggest strong Wanka II differences between statuses, the consumption results show that elites consumed approximately the same diet as the commoners. This suggests that the elites dealt in goods beyond their own consumption, through sharing the gained produce. This was done by using the goods, especially food, as payment, display, or gifts. The Wanka II elites were involved in intense negotiation of political and social position, particularly employing symbolic and social products; food was a requirement in all of these social negotiations.

One elite strategy that is becoming increasingly clear from all of the artifactual evidence was feasts hosted by and taking place within the Wanka II elite patios. Not only the increased maize, but also the evidence from the bone and ceramics (Chapters 8 and 9, this volume) point to this activity being promoted by these entrepreneurial families. Feasting is still an Andean form of social negotiation; preparing hot and special food for guests brings people into obligation and community such that future activities can rely on these hosted people, We know that the Inka regularly did this, most likely at their *tampus* and now the Xauxa LIP evidence also quite strongly demonstrates this same activity going on within these WankaII elite households (Hastorf and Johannessen, 1993). Such families would have called in kin to help with this activity; and through feasting with their wider kin and allies, they would have maintained and augmented their social and political alliances. Given that different family groups could have done this during the ritual calendar, political alliances could have crosscut all communities, from the smallest kin groups up to multiple community alliances.

With the Inka conquest, the Xauxa were relocated and restructured economically and politically. As has been argued earlier, these changes in production were not simply the result of being relocated closer to the valleys. There was a clear shift in agricultural production at the domestic level, beyond Inka labor tax and native elite motivation. This can be seen in the increased maize production *and* consumption, as well as in the evidence of leveling in the access to goods. Thus, the botanical data, along with the other artifactual data, support the first of the two models, that the Inka did intervene in native household production as well as diminish the capacity of local elites to promote their political positions as they had done earlier, The botanical data support the idea that local agriculture intensified under Inka rule, with a focus on maize production.

The Inka state was financed by staple goods extracted from conquered people. Because the Mantaro region was a rich agricultural area, it is not surprising that Xauxa agriculture was reorganized and domestic production was affected. The Inka, while promoting a certain group of indigenous leaders, also leveled the conquered people into one class, suggesting a diminished capacity for local elites to promote their positions. Finally, the stable isotope data reflect selectively increased maize consumption in Wanka III times. The consumption data inform us that Inka economics had an impact on local consumption patterns as well.

I propose that these economic developments charted here are based on the activities that occurred in the larger sociopolitical arena, outside the domestic household unit. For the Xauxa, the Inka entered their local economic sphere, their houses and larders, encouraging or forcing them to join the Inka symbolic and economic system, affecting both their internal economics as well as their sociopolitical systems.

Chapter 8

Animal Husbandry and Meat Consumption

Elsie C. Sandefur

In this chapter, animal subsistence data are compared for elite and commoner patio groups in two succeeding time periods: Wanka II, the latter part of the Late Intermediate Period (LIP), and Wanka III, the Late Horizon. Bones recovered from the patios are assumed to be the remains of animals that were brought to domestic units for subsistence or ritual use, and for secondary production activities, such as weaving. The analysis of faunal remains helps us to investigate a very important aspect of economic change in Xauxa households. The inferences from the osteological evidence that apply to Xauxa animal husbandry presented here are based on ethnographic descriptions of traditional pastoralism in Peru.[1] Probably the greatest share of herd management tasks, such as the culling, would have taken place on the *puna,* the natural environment for camelid pastoralism. No *puna* sites are represented in the sample data but the ultimate domestic use of the animals is reflected by the bones discarded in the analyzed household spaces. Individual household use, then, produced the faunal remains that have been sampled and analyzed for comparisons of status and time.

THE NATURE OF A MIXED AGROPASTORAL ECONOMY

The combination of farming and herding for subsistence has been practiced by many societies since the beginning of agriculture. Together, the two methods of making a living have advantages that neither one fulfills alone. The agro-pastoral economy has implications for energetics, risk management, labor organization, and scheduling. Thomas (1973) provides an excellent discussion of the energetics of agricultural and pastoral systems in the Andes. He describes *pastoralism* as an efficient utilization of land that cannot be productively modified for agriculture. In contrast to agriculture, where every calorie spent in labor produced almost 12 calories, however, the calories produced from herding only slightly exceed those expended. Herding is nonetheless an alternative economic pattern that adds stability to future subsistence regimes, supplements agricultural production, and buffers nutritional stress in the event of crop failure. Llamas and alpacas serve as an important

[1] Ethnographic information on modern camelid use is taken from Flores-Ochoa (1968, 1977), Franklin (1982), and from Thomas's (1973) research on the herding of Nuñoa, Peru. An excellent study of herd dynamics may be found in Flannery *et al.* (1989).

converter of plant material inedible for humans, such as *ichu* grass *(Stipa ichu),* into a human food source. In addition, their wool is extremely versatile within highland society.

Llamas and alpacas, the domestic camelids, have been the main subsistence animals in Central Andean pastoralism since the Early Horizon (Browman, 1974; Pires-Ferreira, J. W., Pires-Ferriera, E., and Kaulicke, 1976; Rick, 1980). In the Upper Mantaro Valley, excavations at Pancan (J1), near Jauja, suggest that pastoralism was supplementary to agriculture in Xauxa settlements by the Early Intermediate Period (EIP) (Earle *et al.,* 1987; Hastorf *et al.,* 1989; Sandefur, 1988a). Camelids constitute a more reliable food source than agricultural crops because the herds are less influenced by local bad weather, except during the springtime birth season. If a drought destroys a large portion of crops, camelids can survive because of their mobility and greater endogenous food reserves. In turn, they provide a food source for humans under difficult environmental conditions (Lynch, 1973; Franklin, 1982).

Successful potato cultivation in the Andes today is highly dependent on the fertilizer from camelid dung (Thomas, 1973; Flannery, Marcus, and Reynolds, 1989). Grazing herds concentrate nutrients from a large land mass in their excrement and eliminate a portion of this in piles on the pasture or in corrals. More directly, camelids graze on the agricultural fields during the fallow period and their excrement contributes to soil fertility. Typically, adult camelids require about 2 ha of land each for grazing without degrading the environment, although they have to be moved about every half hour.

Although the number of animals a family can handle depends upon the labor that is available for herding, pastoral workloads are not as intensive as the labor required for agriculture. Because family herds require regular light-to-moderate work levels, household members who are too young, too old, or too feeble to work in the fields can perform daily herding activities (Flores-Ochoa, 1968; Thomas, 1973). Important herding work also accommodates the agricultural schedule. Shearing of alpacas and llamas starts after planting in November or December and slaughtering follows the potato harvest in May, after the rainy season, when camelids reached their maximum annual weight (Flores-Ochoa, 1968; Thomas, 1973). Slaughtering at this time maximizes the production of meat and fewer camelids have to be kept on the limited dry-season pasture. The cold nights and intense sun of this period also facilitate the production of *ch'arki,* or freeze-dried meat. When prepared, the meat weighs between one-fourth and one-third of its original weight and can be more readily transported and stored.

In addition to nutrient cycling, agricultural production depends on camelids for the transport of crops. Transportation is of considerable importance to agricultural families. Crops could be carried by family members alone, but this activity requires a considerable expenditure of human energy, whereas the energy expended by the working llama is derived from sources inedible for men. Because they can both forage and browse on a wide variety of grasses, llamas are effective, light-weight cargo bearers in the high elevations.

The economic importance of domestic animals, especially llamas and alpacas, cannot simply be equated with their value as meat sources or beasts of burden. Household animals exist also as symbols of wealth, as pets, and as very personal belongings—roles that may sometimes outweigh the value of the meat itself. When the Spaniards arrived, the elites of the Bolivian altiplano were renowned for their wealth on the hoof, which provided the wool for the enormously rich and esteemed textiles produced by specialist and household weavers alike (Diez de San Miguel, 1964; Murra, 1962; Costin, Chapter 9, this volume). In exchange for loyalty and acceptance of the new authority, the Inka may have left the family herds alone as a strategic act of benevolence (Costin and Earle, 1989:692). Camelid entrails were used in divination, and some camelids, seen as particularly important symbolically, were used for all important offering to the deities. Similarly, the chroniclers often noted that the three materials most often offered in sacrifice were cloth, camelids, and *chicha* (e.g., Cobo, 1990). The importance of the flocks was such that when the Inkas conquered highland Ecuador, they installed camelid herds, which were not widespread in the region (Salomon, 1986). Camelids were founts of food, wealth, and symbolic value to the peoples of the Andes.

FAUNA OF THE XAUXA REGION

Hunted Animals

Both wild and domesticated animals were part of the prehistoric Xauxa diet. The Xauxa hunted vicuña, deer, birds, frogs, and sometimes skunks and weasels. With the exception of deer and vicuña, however, according to evidence from both faunal remains and lithic artifacts, hunted species played a minor role in Xauxa subsistence (Russell, 1988; Sandefur, 1988a). Vicuña *(Vicugna vicugna* Molina) were hunted by using drive traps or kill traps (Rowe, 1946). Deer, solitary animals, were individually stalked or ambushed (Wing, 1972). Two species of deer are found in the Xauxa area. The white-tailed deer *(Odocoileus virginianusperuvianus* Gray) is a descendant of those that entered the Andes from Asia via North America in the early Pleistocene. The Andean deer, the *taruga (Hippocamelus antisensis* D'Orbigny), an indigenous species, managed to survive the invasion of the northern ungulates.[2] Chance encounters with sick, lame, or wounded wild animals could also have provided easy acquisition of additional meat.

Domesticated Animals

Prehistorically, there were five domesticated animals in Peru: llamas and alpacas of the camelid family, dogs, Muscovy ducks, and guinea pigs. All but ducks were represented in the Xauxa sites. By the Formative Period, domestication of the camelids had been in progress for at least 2,500 years (Wheeler, 1984; Wing, 1986). Currently, however, the place and time of the domestication of camelids are not known (Flannery *et al.,* 1989) and

[2] Zoogeography, camelid evolution, and ecology of the area may be examined in Franklin (1982), Patterson and Pascual (1972), and Sandefur (1988a).

Andean domestication is inferred primarily from changes in the patterns of animal use.[3] The llama *(Lama glama* Linnaeus 1758) is the larger of the two domesticated camelids that provided the chief meat sources for Xauxa households. Llama meat is considered quite tough and less palatable than alpaca. As a food source, llamas produce 957 kcal/kg of live weight; an average adult weighs about 90 kg. Modem pastoralists use almost the entire slaughtered animal. Besides the meat, all organs, blood, tissue, tendons, and hides are used (Thomas, 1973; Miller, 1979; Flannery *et al.,* 1989). The small amount of discarded material is fed to the dogs. In Peruvian pastoral families today, animals that have died from natural causes are frequently consumed.

The llama's primary utility is as a pack animal. Adult males typically can carry loads of about 30 kg for 20 km/day, although they can sustain heavier loads (up to 45 kg) for short distances. For long hauls, such as caravan trips, llamas can travel about 20 km a day, six days a week, alternating two days of carrying cargo with one day of unloaded travel (Murra, 1965; West, 1981; Flannery *et al.,* 1989; D'Altroy, 1992:85). As noted earlier, transportation is of considerable importance to agricultural families who exploit a wide range of microenvironments and trade their surplus with other regions. Today, an effective agricultural subsistence base leans heavily on the use of the llama to transport fertilizer to the fields and crops to the household or to market. An additional use of the llama as a pack animal occurs at harvest, when potatoes and grain need to be transported from the fields to the family household. Caravans of llamas carrying goods are still seen coming down from the upper elevations in the Jauja area.

There are important differences between the llama and the alpaca *(Lama pacos* Linnaeus 1758) in terms of their economic roles. Smaller than llamas, alpacas are not cargo carriers and produce less meat per animal, although they are fattier than llamas and yield about 1,500 kcal/kg of meat (Thomas, 1973). In prehistory, as today, alpacas were kept primarily as wool producers (Topic, McGreevy, and Topic, 1987). They produce 0.4 kg more wool per year than llamas, and their fine, silky wool today sells for about 60% more than does llama wool. Alpacas are best adapted to the wet *bofedale* pasture lands, restricted to high altitudes. At lower elevations or in areas where the pasture is hard and dry, alpacas are likely to suffer from various diseases and conditions that adversely affect wool quality and quantity. After six to seven years, their wool production decreases substantially and they are slaughtered.

The Xauxa probably used the dog *(Canis familiaris)* as a sacrificial animal, hunting companion, watchdog, and occasional food source. In Thomas's (1973) study of modem Nuñoa households, the dog functions principally as a protector against crop or animal loss and assists in herding. Dogs accompanying children as young as six years are common partners in animal herding today (Flores-Ochoa, 1979; author's personal observation). The guinea pig or *cuy* (Cavia *porcellus porcellus Linne)* is a large hypsodont rodent that has been domesticated so long that its wild ancestry is not known (DuPlaix and Simon, 1983). In terms of quantities of meat, the guinea pig contributed little to the diet but it had value that

[3] Discussions on camelid domestication may be found in works by Flores-Ochoa (1977), Franklin (1982), and Laming (1967), and by zooarchaeologists who specialize in Andean fauna—particularly Elizabeth Wing (1977, 1986); Kent Flannery *et al.* (1989); Jane Wheeler (1982); Jonathan Kent (1987); and George Miller (1979).

transcended its use as table meat—it was used in feasts. Andrews (1 974) and Bolton (1979) further describe its use in home remedies and curing ceremonies.

FAUNAL DATA

This section presents the faunal data from 3 1 Xauxa patio groups excavated from 1977 through 1983. The faunal remains are analyzed and compared for the two time periods, Wanka II and Wanka III, and the two social statuses, elite and commoner that have been outlined in previous chapters (see Chapters 2 and 4, this volume). Meat consumption is assessed for each category of fauna, and then the camelid remains, which form the bulk of the assemblage, are examined in greater detail. The data summarized in Tables 8.1–8.3 are presented graphically in Figures 8.1–8.8.

Methods

Zooarchaeologists use several methods to assess the nature of archaeological faunal assemblages. One of the important techniques of faunal analysis used in this study is the measurement ofthe kilograms of meat represented by the recovered remains. The advantage of using meat weights is evident when one considers that, as food, animals contribute amounts of meat that differ according to their species, age, and size. For example, 75 kg of camelid meat will feed an extended family for perhaps a month and is valued more than the one-half kilogram of meat from a guinea pig that will suffice for only one small family dinner. Documenting the contribution of meat rather than the number of animals (minimum number of individuals; MNI) or the number of recovered bones (Number of Identified Specimens; NISP) measures the an important factor for comparing the diets of different times and statuses.

There is no valid way to calculate the actual amounts of meat consumed by the patio occupants. It cannot be assumed that all bones were discarded in the patio to remain there for excavation. The same constant of computed meat weight for comparison of animal subsistence between statuses and times is more important than an accurate weight for each species. Meat weight, calculated from the MNI of adult, juvenile, and immature animals, is a simplified estimation that does not claim to be exact but is useful for comparison purposes. The live body weight is calculated with an estimated amount subtracted for hide and bones. For example, meat weights are estimated at 75 kg for adult, sub-adult, or old camelids, 64 kg for juveniles, and 7 kg for immatures. Camelid weights were taken from Franklin (1982), and deer weight from Rue (1979).

Meat weights per species were calculated and then adjusted for the volume of the excavations to make the values comparable. In the research design for the project, nearly equal volumes were excavated from domestic patios in each of the four analytical groups: elite and commoner statuses from Wanka II and III. The narrow range of 30-42m^3 for each group lends strength to comparisons of faunal use. The tabulated quantity of meat (Table 8.1, Column 9) is not meant to represent real consumption but is a statistical figure used to compare meat consumption in a standardized volume. MNI figures, also presented in Tables

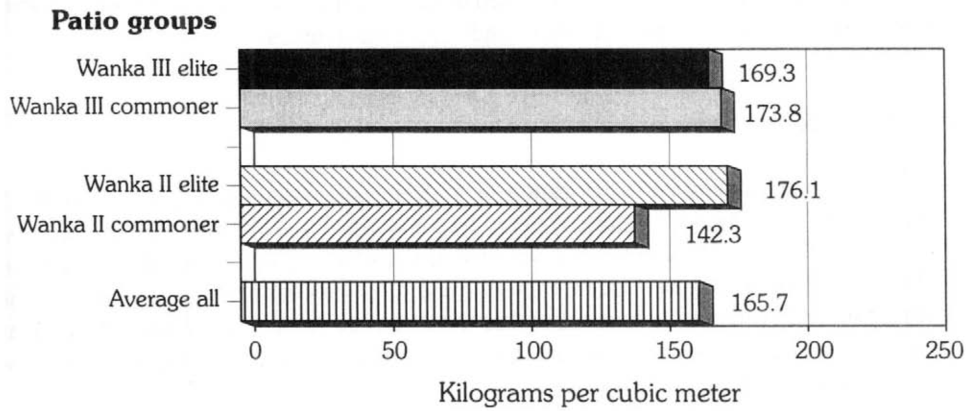

Figure 8.1. Density of meat in domestic patios, all species. Total kg of meat = 24,202.8. *Average All* is the average meat consumption for both times and statuses.

8.1 and 8.2, are not extensively employed in the detailed analyses presented here, because, as stated earlier of primary interest are the relative amounts of meat consumed, not the total number of animals involved, since all time periods and statuses had herds of camelids.

Meat Consumption

Figure 8.1 shows the kilograms of *all* meat per cubic meter (kg/m^3) for the four analytical groups. We see that Wanka III households consumed slightly more meat than in the preceding phase. In Wanka II, a small difference in meat consumption existed between the elite and commoner households. Elites' meat consumption was 176.1 kg/m^3 and commoners', 142.3 kg/m^3, a difference representing about 20% more meat for the elites. This relatively minor difference in meat consumption disappears in the Wanka III data, since elites had 169.3 kg/m^3 and commoners slightly more, with 173.8 kg/m^3.

The average for all domestic patios, 166 kg/m^3, may be considered a small amount of meat for the Wanka II and Wanka III phases; however, the number represents a substantial (100%) increase of meat in the diet when compared to meat density values from the preceding Early Intermediate Period and Middle Horizon at Pancan (Sandefur, 1988a).

Camelid Meat

Figure 8.2 compares camelid meat densities among the patios. It includes all camelids to get an overview of the major edible taxa. Although variations in animal use were found for the four compared categories, a Student's *t* test showed no statistically significant difference in the use of camelid meat between Wanka II and Wanka III ($t = 0.3892$; critical values for alpha = .05: two-tailed = 2.2281, one-tailed = 1.8125).[4]

[4] The method and results of tests of significance are detailed in Sandefur (1988a).

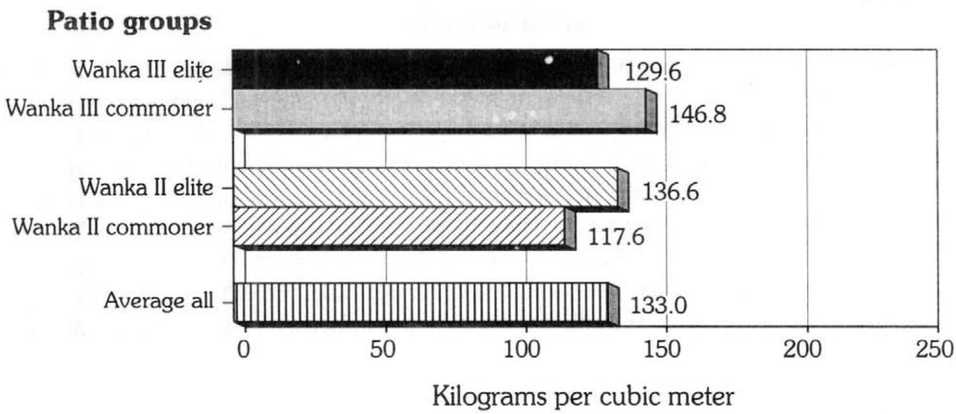

Figure 8.2. Density of camelid meat in domestic patios. *Average All* is the average meat consumption for both times and statuses.

Deer Meat

Figure 8.3 illustrates the density of deer meat in domestic patio groups. From early Huacrapukio II (A.D. 400) through the early LIP (A.D. 1200), there was a decrease in the use of deer meat (Sandefur, 1988a; data not shown in Figure 8.3). From Wanka I to Wanka II, there was a small increase, from an average of 6.1 kg/m^3 to 10.1 kg/m^3 (average for all contexts). Even more deer meat (18.3 kg/m^3 average) is represented in the Wanka III sites. There was a statistically significant increase between Wanka II and Wanka III ($t = 2.7608$; critical values for alpha= .05: two-tailed = 2.1199, one-tailed = 1.7459). The increase in the elite consumption of deer meat from Wanka II to Wanka III was accompanied by an increased difference between statuses.

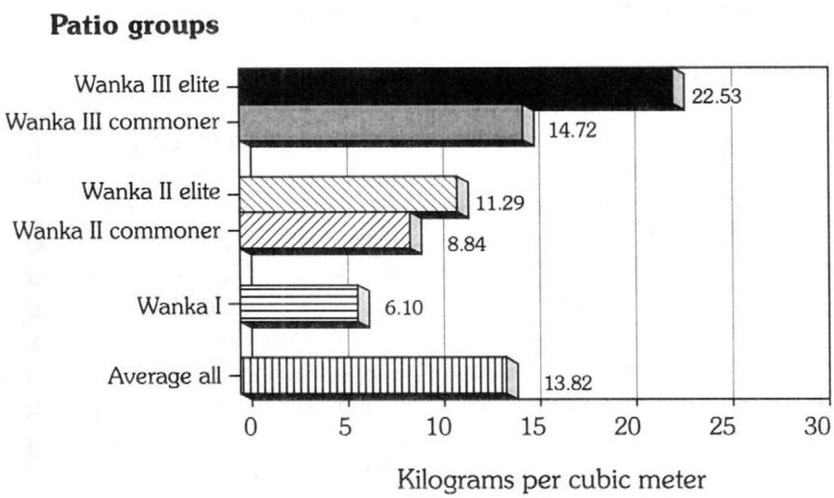

Figure 8.3. Density of deer meat in domestic patios. *Average All* is the average meat consumption for both times and statuses; Wanka I for comparison only, is not included in the average.

Dog Meat

The dog bones used to calculate amounts of meat did not include burials but were part of the general food bone remains found in middens and floors. Butchering cuts on some of the bones suggest that some dog was used for food, which is also mentioned in historic reports about the Wanka ethnic group. The use of dog meat increased from Wanka II to Wanka III (15 vs. 24 MNI; Table 8.2, column 9), and there was a status difference in the use of dogs for food. Commoners ate significantly more dog meat than elites in both Wanka II (4.26 vs.3.13 kg/m^3) and Wanka III (5.75 vs. 2.8 kg/m^3) respectively (t = 2.1378; df= 21; critical values for alpha = .05: two-tailed = 2.0796, one-tailed = 1.7207). The data suggest that this meat source, available to all, was not as highly valued as camelid or, especially, deer meat.

Guinea Pig Meat

Overall, guinea pig consumption did not change markedly from either Wanka II to III or between statuses. More evidence for use in the commoner patios in Wanka II (26 versus 24 kg/m^3) to Wanka III (29 vs. 21 kg/m^3) paralleled the slight increase of dogs for the same periods (Table 8.2). Elite consumption remained less and was stable over the two periods, suggesting that guinea pigs were also a regular but not the most highly valued meat source for the Xauxa.

Microfauna Meat

The use of microfauna, such as birds and frogs, for food was minimal for both status groups in both periods. More rodent remains were recovered in Wanka III than in Wanka II (Table 8.2).

Camelids: Skeletal Part Distribution and Age at Death

Skeletal Part Distribution

The camelid skeletal remains, which constitute most of the faunal assemblage, merit more detailed examination. Figure 8.4 summarizes the weight per volume of recovered camelid bones belonging to two functionally important parts of the camelid anatomy: meaty and nonmeaty. The meat-bearing bones are the upper limbs, such as the scapula, humerus, ulna, femur and tibia, and bones of the head and torso, including the cranium, mandible, cervical, thoracic, and lumbar vertebrae, the pelvis, as well as the ribs. Nonmeaty parts include the caudal vertebrae, carpals and tarsals, metacarpals and metatarsals, and phalanges. Analysis of the distribution of skeletal parts disclosed that both the bones having a heavy meat weight, such as those of the torso and upper limbs, and bones having little meat, such as the lower limbs and feet, were well-represented in the camelid remains of all patio groups. In general, there are more meaty than nonmeaty bones present in all patio groups, but the

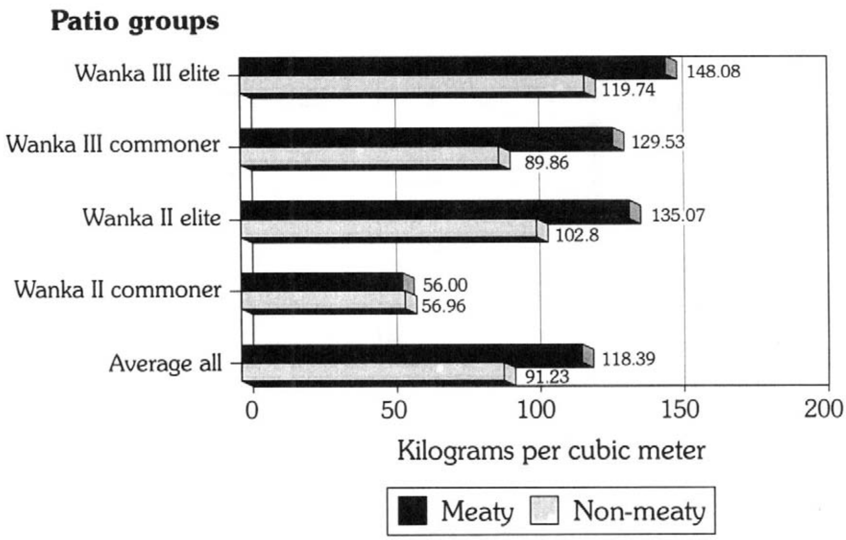

Figure 8.4. Camelid meat distribution, meaty versus nonmeaty parts. *Average All* is the average meaty and nonmeaty parts for both time phases and statuses.

evidence also suggests that these animals were slaughtered and butchered quite nearby, and most of the bones were brought back to the patio area to be used and ultimately deposited.

Turning to the meat evidence in the two statuses, Student's t tests support that there is a significant difference in the distribution of meaty parts between the patios of Wanka II commoners and elites. In Wanka II, the elites' meat consumption consisted of more than twice as many meaty parts (135 gm/m^3) as the commoners' (56 gm/m^3); (t = 1.769; df= 16; critical value for alpha = .05: one-tailed = 1.7459). Total camelid meat consumption also was less forthe commoners, but the difference is not statistically significant (see Figure 8.2).

In Wanka III, this difference in meat quality between the elites and commoners virtually disappeared, since the commoners had almost as many of the better parts of the butchered camelids as did the elites. Comparing Wanka II and III statuses, meaty parts for the elites remained about the same but more than doubled for the commoners, from 56 gm/m^3 to 130 gm/m^3 (t = 2.1532; df= 17; critical values for alpha = .05: two-tailed = 2.1098, one-tailed = 1.7396). These results strongly display the status leveling discussed in other chapters in this volume, especially the maize evidence.

Distribution of Camelid Ages at Death

Assessing the age at death of the camelids recovered from the sample provides further insight into Xauxa herding, use, and value of the herds. Figure 8.5 shows the percentage of the MNI for five age groups ofcamelids: immature, juvenile, subadult, adult, and old. Tooth eruption and wear, epiphyseal fusion of the long bones, and relative size of the bone fragments are used to assign the age at death for the camelids. Tooth wear and eruption ages were assessed chiefly by data from Wheeler (1982), and Hillson (1986), with aid from Klein

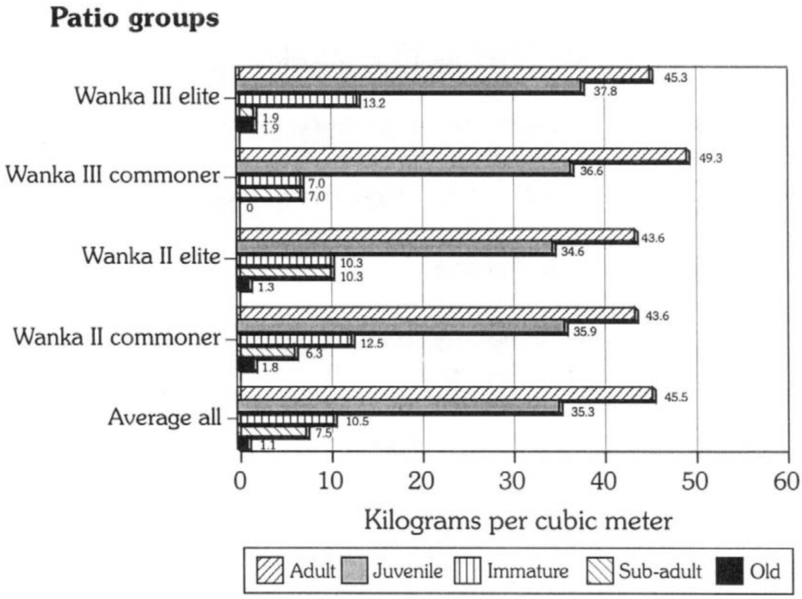

Figure 8.5. Age profile of camelids used in domestic patios. AD = Adult, JUV = Juvenile, S-AD = Sub-adult, IMM = Immature.

and Cruz-Uribe (1984). When long bone ends are present, the animal is considered an *adult* when the epiphysis is completely fused, a *sub-adult* when the epiphyseal fusion line is very evident, and a *juvenile* when the epiphysis is missing. When the size of the bone is obviously near that of a newborn, the *immature* age category is assigned. *Old* age is designated by extreme wear of teeth, missing teeth with shrunken, resorbed alveoli, or spicules on muscular ridges or vertebral centra. The percentages of immature camelids from the household contexts are similar for both periods, ranging from 7% to 13% of the individuals. An average of 43% are juveniles plus subadults, with 47% of slaughtered camelids for both statuses and times in the *adult* and *old* age range. Therefore, the Xauxa residents killed and ate older animals, probably after they had helped in wool production.

Klein and Cruz-Uribe (1984) recommend the Kolmogorov–Smirnov (K–S) test (Siegel, 1956; Blalock, 1972) as the most useful statistical procedure for determining the probability that two samples in an age profile differ simply by chance. Following their suggestion, a K–S test was used to assess the differences in animal use among the four analytical groups (i.e., Wanka II and III elites and commoners). These results imply that the age distributions of camelids did not differ significantly. This outcome, in turn, also suggests deliberate culling and killing of animals, a similar pattern through time and status. In addition, there were no significant differences in the mortality profiles between Wanka II and Wanka III or between the elites and commoners of either period. Such a pattern implies the use of standard herding practices among households that were affected neither by status nor by state intrusion (Sandefur, 1988a).

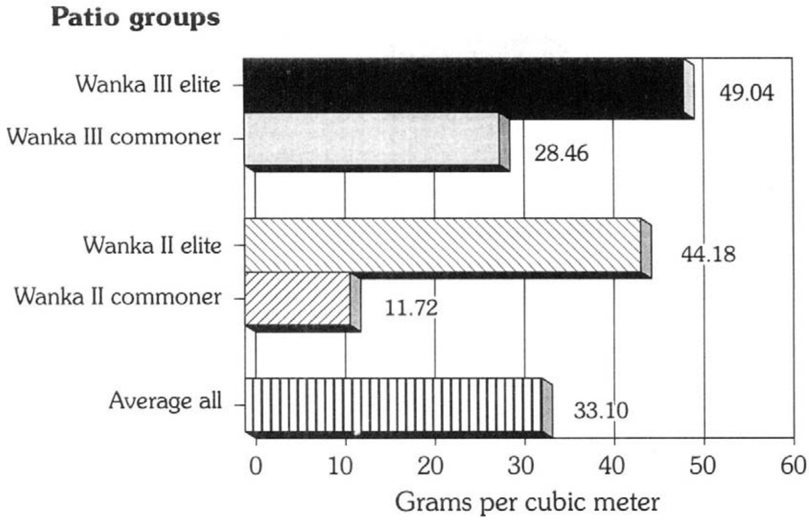

Figure 8.6. Modified bone, burned. *Average All* is the average burned bone for both time phases and statuses.

Modified Bone

The faunal remains were closely examined to detect all modified bone such as burned, cut, and gnawed bone, as well as bone tools. Grams of modified bone per cubic meter of excavated matrix are presented to get a sense of overall bone usage across the four analytical groups. Figure 8.6 shows the distribution of burned bone in gm/m^3. In both time periods, the elite patios contained significantly more burned bone: 80% in Wanka II, and 63% in Wanka III. As was the case with the camelid meaty parts discussed earlier, these data suggest that the elites cooked and perhaps ate more camelid meat than commoners. With respect to deliberately cut bone, Figure 8.7 shows the Wanka II elite patios to contain 107.45 gm/m^3, or 76% of the Wanka II total. In Wanka III, elite patios contained both a lower density and fraction: 92.66 gm/m^3, or 68% of the total cut bone. These results also suggest that elites had more animals or perhaps used their animals for events within their households.

Bone tools represent a different category of object than the previously described ecofacts because they reflect industrial use rather than food consumption. Figure 8.8 shows the number of bone tools per cubic meter for the four analytical groups. Again, elite patios contain significantly more bone tools or fragments for both time periods: 66% of the Wanka II tools or fragments, and 61% of the Wanka III tools or fragments. Equally notable is the much greater density of bone tools in Wanka II patios in comparison to Wanka III: 8.0 tools/m^3 and 3.3 tools/m^3, respectively. This strongly supports our idea that the elites, especially in the Wanka II times, were entrepreneurs and industriously worked on a range of production within their larger households.

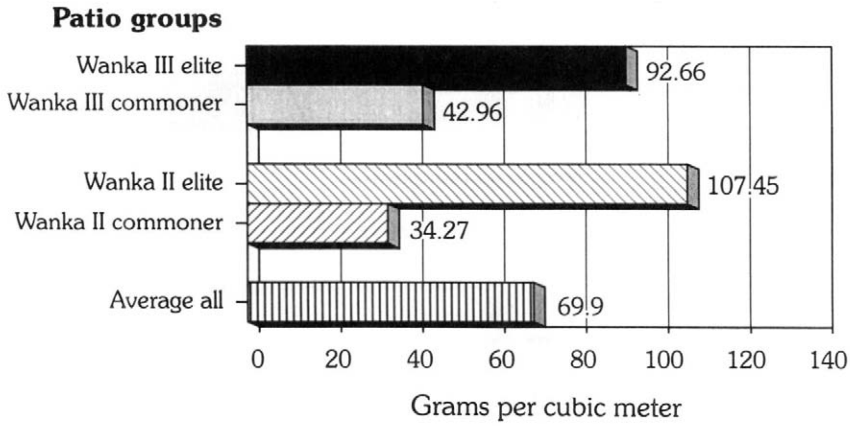

Figure 8.7. Modified bone, cut. *Average All* is the average cut bone for both time phases and statuses.

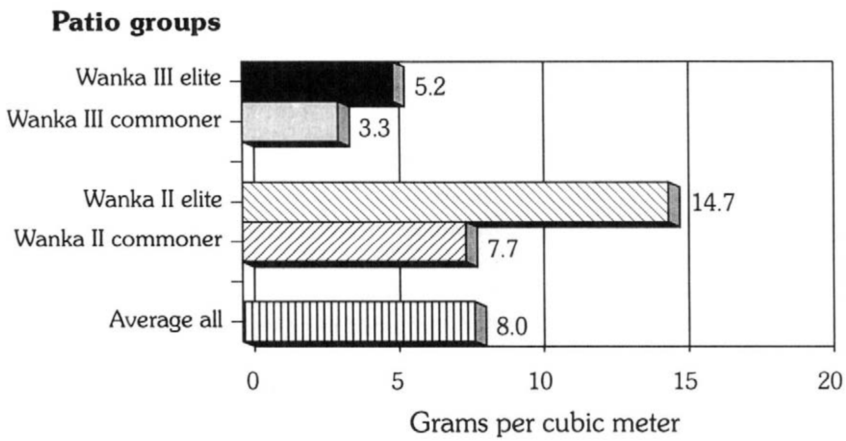

Figure 8.8. Modified bone, tooled. *Average All* is the average tooled bone and bone fragments for both time phases and statuses.

DATA INTERPRETATION

General Meat Distribution

The change in meat distribution from Wanka II to Wanka III most directly reflects the change in meat consumption that may have resulted from the lnka conquest. Overall meat consumption increased for the commoners and remained nearly the same for the elites over time (Figures 8.6 and 8.7). The Wanka III diet was better than the Wanka II diet, with more meat and more maize (see Chapter 7, this volume). This meat came from a narrow range of species: 88.7% by weight was camelid. Despite the Inka penchant for long-distance travel, there was no evidence of trade for animals outside of the Xauxa's natural geographic range (Sandefur, 1988a), and the age-at-death profiles reflect more meat and wool use than transport, If over-grazing or insufficient pasture lands attributable to the importation of large military herds of the Inka affected herd production, such as is discussed by Browman (1974) or Thomas and Winterhalder (1976), it did not affect domestic camelid meat consumption. The *puna,* uplands, and hills around the Xauxa sites were probably sufficient to pasture both state and family herds. Although the Inkas conscripted household labor to till state agricultural fields and to manage the state herds, that practice evidently did not influence the management of family herds.

The distribution of camelid meat indicates that the households continuously occupied from Wanka II into Wanka III experienced no deprivation of camelid meat after the Inka conquest. Commoners' access to their herds continued and the amount of camelid meat consumed by households increased over time. For the elite, meat consumption underwent little change. This pattern suggests that herds increased over time as commoners increased their focus on pastoralism.

Generally, venison played a minor role in the diet of the Xauxa after the EIP. Figure 8.3 shows an increase in consumption of deer meat from Wanka I to Wanka III. This pattern is contrary to the decrease in projectile points from Wanka II to III (Russell, 1988) and also differs from faunal data from other Andean sites that show a general decrease of deer meat usage over time (e.g., Wing, 1972; Wheeler, 1975; Miller, 1979; K. Moore, 1985). These animal carcasses could have been treated differently through time.

An interesting question is why deer meat usage increased for both statuses in Wanka III when, according to Rowe (1946), hunting was strictly regulated and hunting grounds were closed to the people except on special occasions. Of the two genera found in the Upper Mantaro, *taruga* are chiefly found above the tree-line on the *puna,* whereas white-tailed deer are a forest-edge species. The increase of *taruga* would have resulted from increased hunting on the *puna.* Conversely, expansion of agricultural fields or removal of forests would have bolstered the population of white-tailed deer. When mature forest is cut away, plant succession begins anew and clearings fill with browse, providing more food for the white-tailed deer population (Rue, 1979:358–369).

Large communal deer hunts may have procured deer for all the Xauxa residents but especially for the elites. Rowe (1946:217) cites accounts stating that "one of the last imperial hunts was held by Manco Inca near the valley of Jauja" (see Cobo, 1979 [1653]; Cieza de Leon, 1967 [1554]; Garcilaso de la Vega, 1961 [1609]). From the same sources, Rowe also describes the chief hunting weapons as slings, *bolas,* nets, snares, nooses, and clubs for killing animals brought together in surrounds. Rowe's information, which may explain both the increase in deer under the Inka and the lack of associated projectile points, does not explain the across-the-population access to wild deer. This might be a case of the real versus the official.

The use of dog for food in the Xauxa households has been discussed in the early postcontact literature. Garcilaso de la Vega (1966:335) speaks of the "immoderate passion" the Wankas had for dog's meat (see also Guaman Poma de Ayala, 1980). Rowe (1946:219) states, "the Inca had much the same prejudice we have against dog meat, and contemptuously called the Wanka 'dog-eaters.'" The recovery of dog remains, particularly those with butchering marks, reinforces the historical labeling of the Xauxa as dog-eaters. Although the incidence of dog burials decreased over time in the patios (Sandefur, 1988b) and despite the reported contempt by the Inka for eating it, there was an increased use of dog meat (butchered bones) in the Wanka III households. Surprisingly, the presence of dogs produced only a few dog-gnawed bones. The size of incisor grooves and the condition of the ends of long bones indicate that most of the gnawed bone is the result of rodent activity.

Small animals contributed only a few kilograms of meat to the Xauxa diet (Table 8.2). However, meat from small fauna was probably as important to the Xauxa family diet as it is today in the Mantaro Valley, where countless family meals are centered around small species, such as poultry, rabbit, or fish. Guinea pig bones have been found in Andean domestic middens since the early Preceramic (Rick, 1980) and in all of the domestic patios of the Xauxa from the EIP on. Historical records of guinea pig use by the Inkas suggest that guinea pigs were eaten even more commonly than the recovered remains suggest (Rowe, 1946; Gade, 1969; Wing, 1972; Bolton, 1979). The importance of these little animals transcends their nutritional use. Their ritual value is emphasized by the multiple guinea pig burials that have been found in sites of the EIP through historic times in the Upper Mantaro Valley (Sandefur, 1988b). Today, in the Jauja area, ethnographic observation indicates that nearly all households keep guinea pigs and still use cuy as the featured course in ceremonial or holiday meals.

Even though the Wanka III settlements shifted closer to the lakes and streams, there is a striking lack of water-related food resources such as fish and waterfowl. The increase in rodents may be a consequence of the intensified production and storage of agricultural products in Wanka III. Larger numbers of rodents in the elite patios parallel the grain that was stored, especially by the elite (Table 8.2).

Camelids: Skeletal Part Distribution and Age at Death

The distribution of skeletal parts of camelids reflects use of the herds. If meat is transported for a long distance, the kinds and frequencies of skeletal parts found in faunal assemblages reflect it (Binford, 1981; Klein and Cruz-Uribe, 1984). If camelids were butchered on the *puna* and the meat carried to the domestic patios, a large proportion of the heavier, nonmeaty bones should be absent. If the elites had more of the meatier portions of the animals, a larger number of the heavy meat-bearing bones would be found in the elite patios. This situation is precisely what is reflected in Figure 8.4. The presence of all parts of the camelid skeleton in all four analytic categories suggests that animals were usually slaughtered in the patios, however, and were consumed by household occupants. This pattern suggests that no particular patio group seems to have specialized in meat production, which was also the case in domestic households of Wanka I (Sandefur, 1988b).

In Wanka II, the difference in meat quality between the elite and commoner patios may be explained by one or more factors. First, elite feasting may have resulted in the deposition of meaty parts in elite patios. Second, camelids slaughtered in elite patios may have produced more meat than could be used before it spoiled, resulting in gifts of the poorer parts to commoners. Third, differences may also be related to bone density patterns, which differed between elite and commoner statuses. Less bone was recovered from the commoner patios, including fewer animals being slaughtered.

In Wanka III, the increase of meaty parts for the commoners could have been the result of meat received from the Inka in return for labor spent on state-owned herds or other state-directed activities or just more animals slaughtered. Camelids of state herds may have been butchered on the *puna,* with the heavy, nonmeaty parts left or used at the butchering site and the more meaty parts carried by the laborers back to their households.

Turning to analysis of the camelid age-at-death data, we may observe that a systematic selection of ages of animals for slaughter represents factors that pastoralists consider important for the maintenance of their herds (Galvin, 198 1; Klein and Cruz-Uribe, 1984; Pozorski, 1979; Uerpmann, 1973). The mortality profile, or the frequencies of different camelid ages at death, reflects a similar pattern of ages at which both the Wanka II and Wanka III households selected their camelids for food. As defined by Galvin (1981) in her study of specialized pastoralism in Syria, populations whose livestock activities focus on surplus production or insurance, but do not specialize in the animals as a primary food source, will have the following features: (1) Species well-adapted to the environment dominate; (2) herd management reflects a relatively low cost in initial investment, feed, and labor; (3) relatively low-cost energy related to herd maintenance, a situation reflected in culling practices that result in fluctuations in age-category percentages indicating variations in natural mortality and high percentages of adults in a strategy not aimed at surplus maximization; (4) age-category percentages reflect harvesting for multiple purposes rather than the maximization of one product.

Following Galvin's criteria, faunal remains from the Xauxa's domestic patios meet the requirements for production of surplus animals in a subsistence system where livestock was *not* the primary food source but served alternative ends. Xauxa culling practices reflect a fluctuating but low incidence of immature camelids. Relatively equal percentages of adults and juveniles suggest harvesting for multiple uses, including herd size maximization, and use of nonproductive animals and prime-weight animals to maximize meat requirements, as well as use of animals for transportation and wool. Culling of adults suggests that females too old to bear young and all camelids too old to produce good wool or to carry loads would be used for meat. Xauxa households would likely have had no reason to allow old camelids to use corral space or pasturage needed for productive animals.

Because environmental factors would have been the same for both status groups, deliberate selection of the most tender meat might have been a factor responsible for the increased use of immature camelids by the elites over that of the commoners in Wanka III. However, the overall small percentage of newborns suggests no planned strategy for the use of immature camelids but rather the practice of wasting no source of food, including animals that died from natural causes.

For specialized meat production, a high percentage of juveniles would have been slaughtered at prime meat age. This is an age when the meat-to-bone ratio is high, before muscular activity toughens the meat with no significant increase in body size. An average of 43% of *juvenile* plus *subadult* animals suggests that young camelids, probably unproductive females and unruly males unsuitable for transport, were most often slaughtered for prime meat. Some young animals would have been used for sacrifices on solstitial feast days or for other religious occasions. Ceremonies involving the sacrifices of young llamas and alpacas were common in Inka times and are still found today during fiestas (Rowe, 1946; Murra, 1965; Flores-Ochoa, 1968).

Although the K–S test demonstrated no significant differences in the mortality profiles among the four analytical groups, the small disparities in the use of different camelid ages across the Wanka II and Wanka III patios merit comment. For example, a slightly larger percentage of adult-aged camelids deposited in the patios of Wanka III may reflect more camelids used for transportation under the Inka, followed by the disposition of old, worn-out adult animals for household meat. At the same time, the continued use of juveniles also suggests a deliberate, though low-level, selection of young animals for meat.

Bone Modification

The bone modification data clearly indicate that activities regarding meat consumption and bone tool use were different for the elites and commoners of both time periods. The large amounts of burned and cut bone, together with the larger amount of meat consumption, provide evidence for feasting, such as the *harranza familiar* or *Carnival* described by Flannery *et al.* (1989), in addition to the many other political feasts that would have occurred within the communities throughout the yearly cycle (Isbell, 1978).

The small percentage of burned bone in relation to all recovered bone (33.1 gm/m^3 of burned bone compared to 457.6 gm/m^3 total recovered bone) suggests that the general method of cooking meat was boiling, such as in the making of soups or stews, an inference supported by Hastorf and DeNiro's (1985) analysis of food remains in cooking vessels. LeCount's (1987) research on the functional variation in ceramics indicates that in terms of fuel consumption, boiling food is more cost efficient than roasting or any other cooking method. The presence of burned bone suggests that meat was being directly exposed to fire, as in roasting, which leads to more direct discard of meat refuse into hearths (Wing and Brown, 1979). Roasting might have been used to cook a large quantity of meat at one time, as would be expected for feeding groups larger than the family, or it may have been a special way of cooking for an important occasion. Although it is more costly in terms of fuel and lost foods, roasted foods may have been preferred at feasts, in a practice similar to the roasting of meats in the *pachamanca* or earth oven pits used for special occasions throughout the Andean highlands today. The greater number of burned bones in elite patios of both phases suggests more use of roasting to cook meat in the elite patios, where there may have been more feasting and preparation of larger meals, as well as less concern for the conservation of fuel or the labor needed to supply such fuel for longer fires. The higher percentages of cut bone (Figure 8.7) also suggest that more butchering of animals occurred in the elite patios during both periods, perhaps for the same activities that produced the high percentages of burned bone.

Turning to the industrial use of bone (Figure 8.8), the drop in Wanka III bone tools might be explained in part by the increase of metal tools across the board during the Inka reign. During that phase, metal artifacts were three times more common in elite patios than in commoner patios (Owen, Chapter 11, this volume). The primary function of bone tools is assumed to be related to craft specialization, specifically with the production of textiles and hides, concentrated in elite households. The proposition that specialized textile production occurred in elite households is based on several factors. High densities of bone tools were not found in patios that produced ceramics but were found with high densities of stone tools that could be used for cutting, scraping, and drilling of hides, and with spindle whorls used in the production of yarn. If bone tools were related to the production of ceramics, they would have been recovered in high numbers in the patios that were producing ceramics. Wanka II ceramic production occurred primarily in Umpamalca commoner patios, however, where bone tool recovery was the lowest.

There is ample evidence that bone tools were used in textile production in the Xauxa households. In addition to keeping people warm at high altitude, cloth in the Andes was an important ceremonial good and preferred gift under the Inkas and probably earlier (Murra, 1962). Wool from llamas and alpacas was the major textile fiber in the Andes; it was spun into yarn and made into cloth. Costin's research on the recovery of spindle whorls provides information on the location and status of cloth production for Xauxa households (Costin and Russell, 1985). Spindle whorl density was highest in the elite patios at Hatunmarca. That situation in itself may be suggestive of weaving specialists who occupied elite households. Recovery of more spindle whorls from elite patios indicates that more textile production occurred in elite households. In Wanka III, especially at Hatunmarca, the parallel decreases in the number of spindle whorls and bone tools point to a drop in local cloth production. It is likely that fine cloth production was shifted to the Inka center at Hatun Xauxa and expropriated from the local leadership. The local leaders might have been receiving fine cloth from the Inka, like the finer metals and ceramics.

Feasts at Hatunmarca

Burned bone, cut bone, and the largest proportion of camelid meat-bearing bones co-occur in the elite patios of Hatunmarca, both during Wanka II, when modified bone recovery was largest, and to a lesser extent in Wanka III, under the Inkas (Table 8.1; Figures 8.6 and 8.7). As described in Chapter 2, the major Wanka II center of Hatunmarca became a smaller town under the Inkas. The distribution of lnka ceramics suggests that the Wanka III population at Hatunmarca contracted to the central areas of each of the two knolls. Two Wanka II elite patios (J2=1 and J2=3) excavated at Hatunmarca are both near the crest of a knoll, adjacent to public plazas. The location of those patios, the amount of modified bone, and the high percentage of camelid meat suggest that they served as sites of feasting or ceremonial entertaining in addition to being elite residences.

The concentration of high-necked storage jars, large, deep, serving basins, and maize in elite patios of both periods suggests activities associated with public feasting (Owen, Russell, and Costin, 1988; Costin and Earle, 1989; Hastorf, 1990b), supporting the osteological evidence for feasts hosted by the Wanka II elites. Feasting functions at Hatunmarca were more pronounced in Wanka II, but the continued high density of modified bone in the elite patios of Wanka III suggests that feasting as a social institution continued into the next period. The reduced level of meat and modified bone at Hatunmarca in Wanka III, however, suggests that feasting events and locations were shared by elite and commoner patios in Marca, the new town established at a lower elevation under the administration of Hatun Xauxa and following Inka resettlement policies.

CONCLUSIONS

This chapter has investigated the changes in faunal consumption, pastoralism, and social inequalities between the time of Xauxa organization at a level of increasingly complex chiefdoms and the period of Inka rule. The analysis of faunal remains from patio excavations evaluated how changes in animal use may have reflected state intervention into household economic and social behavior. The faunal samples analyzed here are from similar contexts, subjected to similar taphonomic and depositional histories, and recovered in similar ways. Measures of taxonomic abundance, such as MNI and NISP, were used to assess differences in taxa frequencies, and meat consumption was measured by the kilograms of meat represented, standardized by the volume of soil excavated.

Review of documentary sources suggests that certain sorts of results should be forthcoming from the faunal evidence. Early historical writers promoted the ideology that all lands and resources belonged to the state through right of conquest (e.g., Cobo, 1979:211, 215; Garcilaso de la Vega, 1966:150–152; see Rowe, 1946:217). All domesticated camelids became the property of the Inka ruler, all wild camelids were animals of the Sun, and no one could hunt on royal lands (Rowe, 1946:217–220; Murra, 1965). If that were true, with the incorporation of the Xauxa groups into the much larger state polity, changes in animal access from the pre-Inka to the Inkaic sites would be expected. Those changes should be observable in the range of animals, the amount of meat, bone density, distribution of meat, and the camelid mortality profile. Lack of change would imply no new forms of leadership regarding pastoralism, with no impact on the domestic animal resources brought on by the Inka.

The zooarchaeological analyses indicate that if Xauxa family herds were confiscated, as the accounts imply, and if animal controls were operating in the Upper Mantaro Valley, those actions did not significantly influence animal utilization in the Xauxa households. The age profile suggests that the same camelid resources were available for Wanka II and Wanka III households. Most meat came from camelids that were no longer useful for transport or wool production; however, camelids were sometimes chosen for meat at their prime weight. Thus, it is very likely that the residents of these valleys kept their own herds and had continued access to them. The infrequent use of immature animals suggests that camelid lambs survived their first months fairly well and that the maintenance of herd size was successful. The small number of very old animals suggests that camelids were not allowed to grow old but were used in the early stage of their nonproductive lives. The distribution of ages varied little for the two time periods and the two status groups. The maintenance of the same patterns of mortality in both phases supports the hypothesis that household herds continued to be managed for the production of wool and for transportation rather than for meat, and that herd management did not change for Xauxa households under the Inka.

These data suggest that there was substantial continuity in household use of animals from the pre-Inka to Inka eras. However, subtle features of the data imply differences between statuses in access to animals, in food processing, and in activities in which bone tools were used. In both periods, elite and commoner status was signified not by the distribution of animal parts but by the quantity of meat consumed. Both meaty and nonmeaty bones were found in nearly equal amounts in elite and commoner patios, suggesting that whole animals were butchered and used within residence units. The faunal evidence suggests that social stratification in Wanka I1 was relatively marked, but in Wanka III, these status distinctions narrowed significantly. There was an apparent leveling of access to meat between the two statuses, and commoners actually had slightly more meat than the elites, although the difference was not statistically significant. The Wanka III elite diet had better cuts of camelid meat, more deer, more guinea pig, and more bird, but less dog and frog than in Wanka II times. The elite harvested their household herds for meat nearly in the same age ratios as they had in the Wanka II times, with the exception that they used more adults and fewer juveniles for meat in Wanka III times.

For the commoners, somewhat better conditions apparently existed after the introduction of imperial rule, since they consumed a little more meat per household, including more camelid, deer, dog, and guinea pig. The commoners harvested their camelid herds for meat in the same manner in both Wanka II and Wanka III times, primarily using animals that had outlived their usefulness but also slaughtering young animals for meat on occasion. In Wanka III, the quality of their meat improved, since they had twice as many meaty parts as in Wanka II. Faunal evidence, unfortunately, cannot help us to identify the source of the camelid meat. The small increase in Wanka III commoner meat consumption could have resulted from one or more factors such as larger family herds, gifts of camelid meat from the authorities, llamas or meat in exchange for labors performed for the state, meat received from ceremonial sacrifices of camelids, or more peaceful conditions for pastoralism under the Inka state.

Some changes also occurred in behaviors related to meat processing and use of bone tools for other activities. With respect to use of llama and alpaca wool for textiles, a heavy concentration of bone tools and the distribution of ceramics and stone tools all point to a specialization in textile production at the elite patios of Hatunmarca in Wanka II. The decrease in number of bone tools and spindle whorls suggests that textile production at Hatunmarca continued at a much reduced rate in Wanka III. It is apparent that bone tools, like the burned and cut bone, saw their maximum usage in the elite patios of Wanka II. The heavy recovery of spindle whorls, the pronounced density of bone tools, and the concentration of camelid bone in the same households strongly suggest craft specialization in the production of yarn and cloth in the elite patios of Hatunmarca. Final interpretation of the function of bone tools, however, awaits more complete analysis of the bone tool assemblage.

The zooarchaeological data also provide insight into feasting behavior. In the Wanka II times, the distributions of modified bone suggest that feasts including camelid meat were celebrated at the large administrative center of Hatunmarca, where burned and cut bone was concentrated in elite patios. The use of more young camelids for meat in Wanka II times suggests that the *kurakas* (elite leaders) selected juvenile animals for sacrifices and feasting. While the amount of burnt bone increased in commoner patios over time, the elite continued to roast meat more frequently than did the commoners. At Hatunmarca, under the new Inka controls, the administration probably used the same elite structures that governed previously; however, the increase of burned and cut bone in commoner patios suggests that the ceremonial orientation shifted, with the state relocating much of the feasting activities to Hatun Xauxa and the elite and commoner patios at Marca, in addition to continuing the festivities at Hatunmarca.

With respect to hunted resources, the data indicate that although deer consumption increased for the commoners in Wanka III, most of the increase of deer was only in the elite patios. This suggests, due to the purported closure of hunting grounds to all but the Inka, that deer meat was obtained by elites from a hunt either ordained by or shared with their conquerors. The cessation of war under Inka rule enabled a new peaceful use of lands surrounding the Wanka III settlements, since a large part ofthe population had been resettled by the Inkas (Earle, 1988). New agricultural lands and pastures would have attracted deer that may then have been serendipitously taken by both the elite and commoner residents.

The evidence from osteological studies indicates the generally positive effect ofthe Inka presence on Xauxa diet. The bulk of the population, the commoners, benefited from the conquest. The resettlement, regional peace, and reorientation of festivities tended to improve the diet, reduce status differences, and give freer access to local resources such as agricultural fields, pastures, and hunting grounds. Finally, it must be emphasized that the faunal data of the Xauxa sites cannot be interpreted in isolation, but combined with other lines of evidence such as plant remains, cooking basins, projectile points, structures, and expanse, they help to reconstruct a household economy where animals were both produced and consumed in a self-sustained domestic system..

Table 8.1. Faunal Remains from 31 Xauxa Patio Groups

Period	Site	Patio Group	Status	Volume (m^3)	Meat (kg)	Kg of meat per m^3	Number of bones	Weight of bone (gm)	MNI
Wanka II	Hatunmarca	4	Commoner	5.29	702.7	132.84	1,035	1,328.31	19
Wanka II	Hatunmarca	6	Commoner	0.88	75.4	85.68	79	61.61	3
Wanka II	Tunanmarca	3	Commoner	7.40	1,066.5	144.12	1,098	2,436.23	47
Wanka II	Tunanmarca	4	Commoner	2.25	337.8	150.13	254	426.84	11
Wanka II	Tunanmarca	5	Commoner	2.55	538.6	211.22	434	712.07	20
Wanka II	Tunanmarca	6	Commoner	4.34	531.9	122.56	526	848.85	22
Wanka II	Tunanmarca	8	Commoner	4.18	537.6	128.61	428	1,025.72	20
Wanka II	Tunanmarca	9	Commoner	1.94	324.8	167.42	156	345.78	12
Wanka II	Umpamalca	4	Commoner	1.85	378.1	204.38	77	2,306.10	13
Wanka II	Umpamalca	5	Commoner	1.94	425.2	219.18	289	444.19	10
Wanka II	Umpamalca	7	Commoner	4.43	354.3	79.98	430	666.72	10
Subtotal			Commoner	37.05	5,272.9		4,806	10,602.42	187
Wanka II	Hatunmarca	3	Elite	5.36	2,687.3	501.36	5,657	12,838.04	67
Wanka II	Hatunmarca	5	Elite	0.32	215.0	671.88	401	1,088.00	3
Wanka II	Tunanmarca	2	Elite	15.47	1,986.2	128.39	3,970	5,454.20	108
Wanka II	Tunanmarca	7	Elite	4.37	370.4	84.76	790	1,174.32	9
WankaII	Umpamalca	I	Elite	8.85	1,516.4	171.34	2,364	2,716.87	29
WankaII	Umpamalca	6	Elite	6.84	565.3	82.65	752	796.00	13
Wanka II	Umpamalca	8	Elite	1.32	150.5	114.02	17	49.20	8
Subtotal			Elite	42.53	7,491.1		13,951	24,116.63	237
Subtotal			All	79.58	12,764.0		18,757	34,719.05	424
Wanka III	Hatunmarca	2	Commoner	7.59	1,116.5	147.10	2,542	3,204.23	44
Wanka III	Hatunmarca	6	Commoner	1.64	376.7	229.70	448	793.59	10
Wanka III	Marca	2	Commoner	10.77	2,188.8	203.23	3,711	6,659.77	67
Wanka III	Marca	9	Commoner	2.38	1,017.1	427.35	1,509	2,524.59	32
Wanka III	Marca	10	Commoner	5.86	943.0	160.92	1,069	1,628.86	34
Wanka III	Huancas	I	Commoner	3.69	140.0	37.94	134	200.80	2
Wanka III	Chucchus	I	Commoner	1.60	306.4	191.50	356	310.01	7
Wanka III	Chucchus	2	Commoner	2.47	168.0	68.02	58	168.61	5
Subtotal			Commoner	36.00	6,256.5		9,827	15,490.46	201
Wanka III	Hatunmarca	1	Elite	12.55	1,950.0	155.38	4,768	8,386.20	79
Wanka III	Hatunmarca	3	Elite	3.78	970.9	256.85	1,966	2,880.09	28
Wanka III	Hatunmarca	5	Elite	5.00	914.3	182.86	2,284	6,195.63	19
Wanka III	Marca	4	Elite	4.94	656.8	132.96	1,257	2,479.81	23
Wanka III	Marca	7	Elite	4.35	690.3	158.69	513	750.38	32
Subtotal			Elite	30.62	5,182.3		10,788	20,692.1 I	18I
Subtotal			All	66.62	11,438.8		20,615	36,182.57	382
Wanka II–III	Total		All	146.20	24,202.8		39,372	70,901.62	806

Table 8.2. Minimum Number of Individuals (MNI) from 31 Xauxa Pation Groups [a]

					Food Animals											Non-food Animals				Burials			
Period	Site	Patio Group	Status	Total MNI	Camelid	Large Mammal	Deer	Dog	Medium Mammal	Cuy	Small Mammal	Bird	Frog	Fish	Misc.	Rodent	Lizard	Sm. Frog	Sm. Bird	Camelid	Cuy	Dog	Misc.
WII	J2	4	C	19	10	0	0	0	0	2	1	1	0	0	0	3	1	1	0	0	0	0	0
WII	J2	6	C	3	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
WII	J7	3	C	47	13	2	1	1	3	9	1	1	0	0	0	6	9	1	0	0	0	0	0
WII	J7	4	C	11	4	1	0	0	0	1	1	0	0	0	0	1	1	2	0	0	0	0	0
WIl	J7	5	C	20	7	0	1	1	1	3	1	0	0	0	0	1	2	2	1	0	0	0	0
WII	J7	6	C	22	8	0	0	4	0	3	0	0	2	1	0	2	1	0	0	0	1	0	0
WII	J7	8	C	20	7	1	1	1	0	4	0	4	0	0	1	1	0	0	0	1	0	0	1
WII	J7	9	C	12	4	1	0	1	2	1	1	0	0	0	0	1	1	0	0	0	1	1	0
WII	J41	4	C	13	5	0	1	1	0	2	0	1	0	0	0	3	0	0	0	0	0	0	0
WII	J41	5	C	10	5	1	0	0	0	1	0	0	2	0	0	1	0	0	0	0	0	0	0
WII	J41	7	C	10	5	0	0	0	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0
Subtotal			C	187	69	6	4	9	6	26	9	7	5	1	1	20	15	7	1	1	2	1	1
WIl	J2	3	E	67	37	1	2	2	2	9	1	2	5	1	0	5	0	0	0	0	0	0	0
WII	J2	5	E	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WII	J7	2	E	108	29	1	2	2	1	8	1	3	3	0	0	15	39	0	0	3	2	0	0
WII	J7	7	E	9	4	1	0	0	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0
WII	J41	1	E	29	8	11	2	1	1	3	0	1	0	0	0	2	0	0	0	0	0	0	0
WII	J41	6	E	13	9	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0
WII	J41	8	E	8	2	0	0	1	0	1	0	1	0	0	0	1	1	1	0	0	0	0	0
Subtotal			E	237	90	15	7	6	6	24	3	7	8	1	0	24	40	1	0	4	2	0	0
Subtotal			All	424	159	21	11	15	12	50	12	14	13	2	1	44	55	8	1	5	4	1	1

(Continued)

Table 8.2. *(Continued)*

					Food Animals											Non-food Animals				Burials			
Period	Site	Patio Group	Status	Total MNI	Camelid	Large Mammal	Deer	Dog	Medium Mammal	Cuy	Small Mammal	Bird	Frog	Fish	Misc.	Rodent	Lizard	Sm. Frog	Sm. Bird	Camelid	Cuy	Dog	Misc.
WIII	J2	2	C	44	15	1	0	2	0	4	1	0	2	0	1	8	7	3	0	0	0	0	0
WIII	J2	6	C	10	4	0	1	1	0	1	1	0	0	0	0	2	0	0	0	0	0	0	0
WIII	J54	2	C	67	27	1	4	8	0	15	1	4	2	0	0	5	0	0	0	0	2	0	0
WIII	J54	9	C	32	14	0	1	3	1	4	1	0	1	0	0	6	0	1	0	0	0	0	0
WIII	J54	10	C	34	13	0	1	3	0	5	2	0	1	1	0	5	1	2	0	0	0	0	0
WIII	J59	1	C	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WIII	J74	1	C	7	4	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0
WIII	J74	2	C	5	3	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Subtotal			C	201	81	5	7	18	3	28	7	4	6	1	1	27	8	6	0	0	2	0	0
WIII	J2	1	E	79	25	0	4	2	0	7	3	2	0	0	0	12	20	4	0	0	0	0	0
WIII	J2	3	E	28	10	1	2	0	2	4	1	0	0	1	3	1	0	1	0	0	0	0	0
WIII	J2	5	E	19	9	3	2	1	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0
WIII	J54	4	E	23	10	0	1	1	0	3	0	1	0	2	0	4	0	2	0	0	0	0	0
WIII	J54	7	E	32	10	2	0	2	0	5	1	0	2	2	0	5	2	0	1	0	0	0	0
Subtotal			E	181	64	6	9	6	2	21	5	5	3	4	1	25	23	6	2	0	0	0	0
Subtotal			All	382	145	11	16	24	5	50	12	9	9	5	2	52	31	12	2	0	2	0	0
W II–III	Total		All	806	304	32	27	39	17	100	24	23	22	7	3	96	86	20	3	5	6	1	1

Table 8.3. Estimated Meat Weights in Kilograms by Species,Size, and Age, Used for Comparison ofAnimal Use at 31 UMARP Patio Groups

Species	Adult and Subadult	Juvenile	Immature	No age determined
Camelid	75.0	64.0	7.0	70.0
Vicuña	32.0	28.0	5.0	32.0
Deer (taruga)	80.0	70.0	10.0	75.0
Large mammal	75.0	64.0	7.0	70.0
Dog	12.0	8.0	2.0	11.0
Medium mammal	12.0	8.0	2.0	11.0
Guinea pig (cuy)	0.5	4.0	0.3	0.4
Small mammal	0.5	4.0	0.3	0.4
Bird	0.5	4.0	0.3	0.5
Frog	0.4	3.0	0.2	0.4
Fish	0.5	—	—	0.5

Chapter 9

Production and Exchange of Ceramics

Cathy Lynne Costin

INTRODUCTION

Contrary to the conclusions of many early studies of the Inka empire (e.g., Baudin, 1961, 1962) and to the Inkas' own propaganda (e.g., Garcilaso de la Vega, 1966), the state did not radically or indiscriminately reorganize the Andean societies it conquered. Rather, the Inkas selectively manipulated those aspects of indigenous culture that impacted directly on state finance, political control, and security. The Inkas sought to subjugate and integrate conquered populations through a series of economic, political, and social policies. The practices included the reorientation of the local political economy and its subsumption within the imperial political economy, diminution of horizontal regional and extraregional political and economic ties in favor of vertical state–localities, the undermining of independent local power bases, and the "Inka-nization" of the symbolic system (Costin and Earle, 1989).

Ceramics, by far the most numerous of the artifact classes recovered in the UMARP excavations, provide striking evidence for the effects of these Inka policies on production and exchange among the Xauxa. The ceramic assemblage reflects both those areas in which the Inka had little direct stake—and therefore little direct impact—and areas in which the state took direct interest. Specifically, the relative stability in the production and exchange of utilitarian ceramics reflects a general attitude of noninterference in the purely local domestic economy. In contrast, the state intervened directly to establish a new system for the production and distribution of state style ceramics, which had an important place in the political economy, the symbolic system, and the structure of sociopolitical rewards. Changes in the exchange and distribution of certain ceramic classes help identify activities that the state sought to control or co-opt for its own ends.

Three issues were of immediate interest in my study of the organization of ceramic production and exchange. The first concerned whether the ceramics used by the Xauxa were manufactured within the study area or imported. Once I identified the production and consumption points, I was able to reconstruct exchange networks and identify the breadth of economic integration. I sought to measure the extent of economic exchange in order to gauge Inka policy regarding interaction among local communities. Political consolidation often leads to expanded economic integration as the interacting population expands and traders are protected from attack by the state's monopoly of force.[1] While our initial

[1] For example, the Ibo village of Afikpo began to expand its ceramic output and market after endemic tribal warfare was reduced by the British Colonial presence (Ottenberg and Ottenberg, 1962)

prediction was that exchange networks would grow after the Inka conquest and pacification (Earle *et al.,* 1987), we recognized that continued local self-sufficiency might reflect Inka strategies for preventing regional alliances that could lead to rebellion.

The second question concerned whether local production of ceramics was generalized—that is, an activity conducted by virtually all households—or specialized, an activity carried out by a limited number of producers whose wares were distributed among a larger group of consumers by barter, reciprocity, or market exchange. Specialization is a result of several processes, including the development of a political economy, pressure from increasing population density to raise productivity and efficiency, and unequal access to resources (Brumfiel and Earle, 1987; Costin, 1986, 1991; Feinman, Kowalewski, and Blanton, 1984; Rice, 1981; Sanders, 1956; Service, 1962). Given that I identified all these processes and conditions in the Upper Mantaro (Costin, 1986:378–391), I predicted that specialization in general would have developed before or during the Wanka II period. The dramatic changes in the Wanka III period—including the regional peace and the demands of the Inka political economy—were expected to promote more intensive specialization.

The third issue involved identifying the forms of specialization within the Xauxa and Inka economies. Specialization is not an unvarying type of production; rather, it encompasses many different types of organization, each expected to occur under particular social, economic, political, and environmental conditions (Costin, 1986, 1991, n.d.). The organization of production can be characterized by four parameters that reflect these underlying conditions.

The first parameter is the *context of production,* or the degree of elite sponsorship in an industry. Production may be attached, in which case artisans work directly for elite or institutional patrons, or it may be generalized, in which case craftspeople produce for a general, unspecified demand crowd. This parameter reflects the degree of social stratification, the nature of the political economy, and types of finance within the political economy. Although we have archaeological and documentary evidence for the development of social and economic differentiation in Wanka II, the goods used by local elites were not qualitatively or stylistically distinct from the commoners (Costin, 1986; Costin and Earle, 1989; Hastorf, 1991). Thus, I did not expect the development of local hierarchies in Wanka II to promote the development of attached specialization. Social differentiation increased in Wanka III, caused primarily by the installation of the Inka bureaucracy. I expected the key catalyst for the development of attached specialization to be institutional demands for specific types of labor and craft goods to service the military, state religion, and administrative bureaucracy.

The second parameter is the *concentration of production,* or the geographic distribution of producers relative to consumers. Producers may be nucleated at a limited number of locations or dispersed widely among the population. This aspect of the organization of production is affected by the geographic distribution of resources, the nature of control over and access to those resources, and factors affecting the movement of goods and people. There is little archaeological evidence for dramatic change in any of these conditions during the Wanka II and III periods. Unfortunately, I know little about the actual distribution of ceramic raw materials in the Yanamarca. A systematic geological survey was not part ofthis study.[2]

Changes in settlement location after the Inka conquest may have affected proximity to basic resources. Although the lnka reorganized agricultural land tenure, they probably respected traditional community access to other raw materials (Moore, 1958). Transportation technology did not change, and the local population could not have benefited from lnka road construction, since local people were rarely allowed to use the roads for nonstate business. The primary factor that may have allowed greater nucleation was the pacification and administrative integration of the region.

The third parameter, the *constitution ofproduction units,* describes their size and principles of organization. Production groups may be small, kin-based units or large workshops staffed by unrelated individuals. This aspect of the organization of production is most directly conditioned by the nature of the technology, the "capital" requirements of the industry and the nature of access to "investment capital," the nature of returns-to-scale, and requirements for supervision. The low-cost, simple nature of Wanka ceramic technology made it highly conducive to low-output, household-based production (cf. Hagstrum, 1989). The production of aryballoids was technologically more complex but did not require extensive equipment or capital outlay. Rather, the stimulus for workshop production of lnka ceramics derives from the state's desire to supervise and control production.

The fourth parameter is the *intensity of production,* or the relative part- or full-time nature of the activity. This aspect of production is affected by several conditions, including the type and cost of technology, the skill and training required for efficient production, and the nature of the domestic economy. There are few indications for full-time production among the Wanka. As discussed earlier, technology was simple and inexpensive. My first impression of the local types was that no great degree of skill or training was required to produce them. Finally, given the nature ofthe peasant economy, I expected that households would remain as diversified as possible in their productive activities. Only Inka ceramics met the criteria necessary to promote full-time specialization. I expected that this more elaborate type might have required greater skill and training, and that the state may have monopolized potters' productive time in order to minimize the amount of imitation or unauthorized state-style pottery produced.

DESCRIPTION OF TYPES RECOVERED

The types recovered in the UMARP excavations have been amply described and illustrated elsewhere (LeBlanc, 1981; Costin, 1986; Hagstrum, 1989; D'AItroy, 1992; Chapter 10, this volume); only a brief description of the primary types is provided here.

[2] In the Mantaro Valley today, ceramic production is highly nucleated and potters collect raw materials just a short distance from their homes (Hagstrum, 1989). However, we do not know if clay sources also exist near non-pottery producing communities.

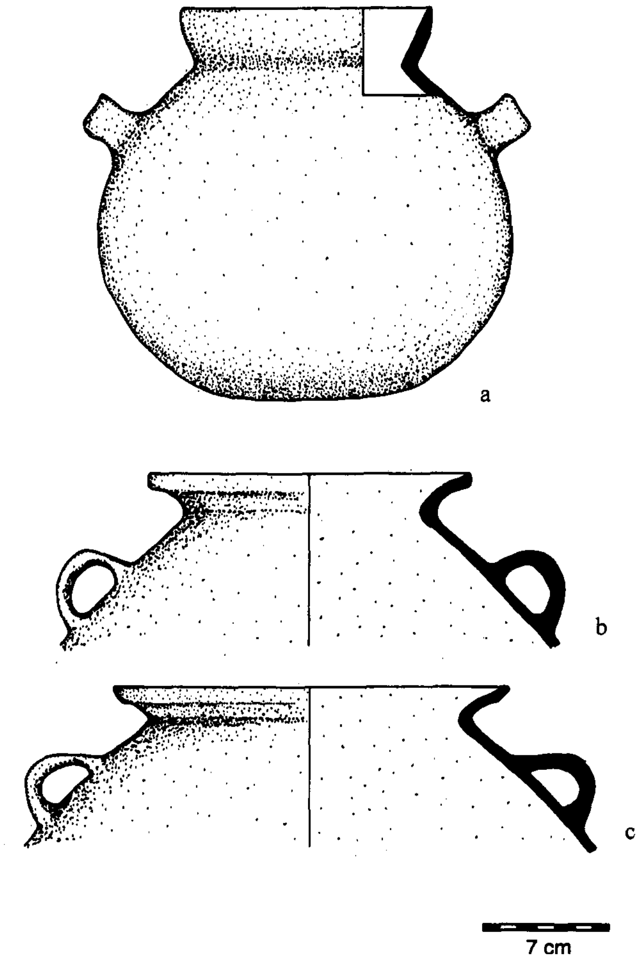

Figure 9.1. Micaceous Self-slip vessel and fragments.

Micaceous Self-slip

This is the ubiquitous household cooking ware. It is distinguished by its paste, a sugary textured, light-reddish-brown ware with abundant light-colored mica inclusions. Almost all Micaceous Self-Slip vessels are low-necked globular jars (Figure 9.1). These vessels are rarely decorated. Occasionally, small nubbins and appliqués were added to vessel shoulders; these have been interpreted as "maker's marks." Infrequently, a thin black or dark-grey line was painted around the collar or rim. Many of the Micaceous Self-slip vessels were sooted on the interior or exterior, indicating their use in cooking and were recovered in both periods, comprising roughly 24% of the assemblage by weight.

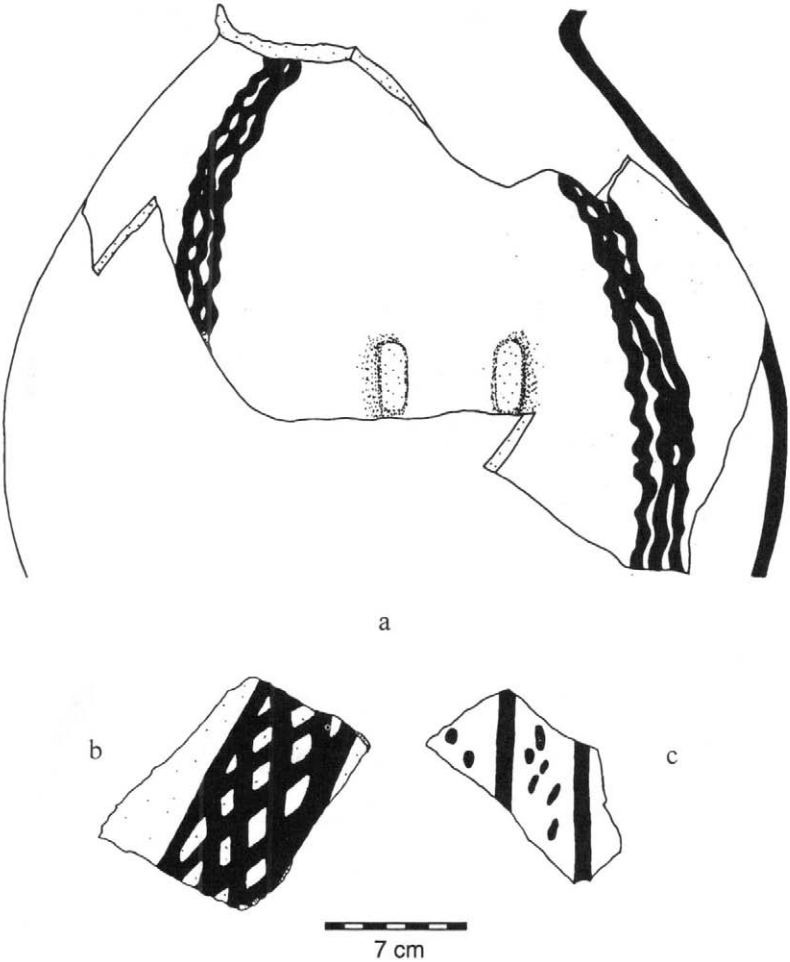

Figure 9.2. Base Clara decorative motifs on body fragments.

Base Clara, Cream Slip, and Wanka Red[3]

These three stylistic variants are often treated together in the analyses because of similarities in their paste and vessels forms. All were manufactured of a fine- to medium-textured paste—usually reddish-yellow or light-reddish-brown—with medium to

[3] A relatively large amount (approximately 41%) ofthe sherds recovered could be classified only as either Wanka Plain or "Too-eroded-to-tell." Wanka Plain sherds were petrographically similar to Base Clara, Cream Slip, and WankaRed, and had an obviously intact (i.e., non-eroded) but otherwise unmodified or undecorated surface. "Too-eroded-to-tell" was petrographically similar to these four types but the surfaces of these sherds had been too badly eroded for us to classify them as to type. Because the time it actually took to distinguish between these two classes was high relative to the usefulness of the information, 90% of these sherds were cataloged together, and a 10% sample was drawn from each analytic unit to calculate the relative frequency of each. Because of this cataloging shorthand, these sherds were included only in analyses based on mineralogy; when analyses were based on style, these "types" were excluded.

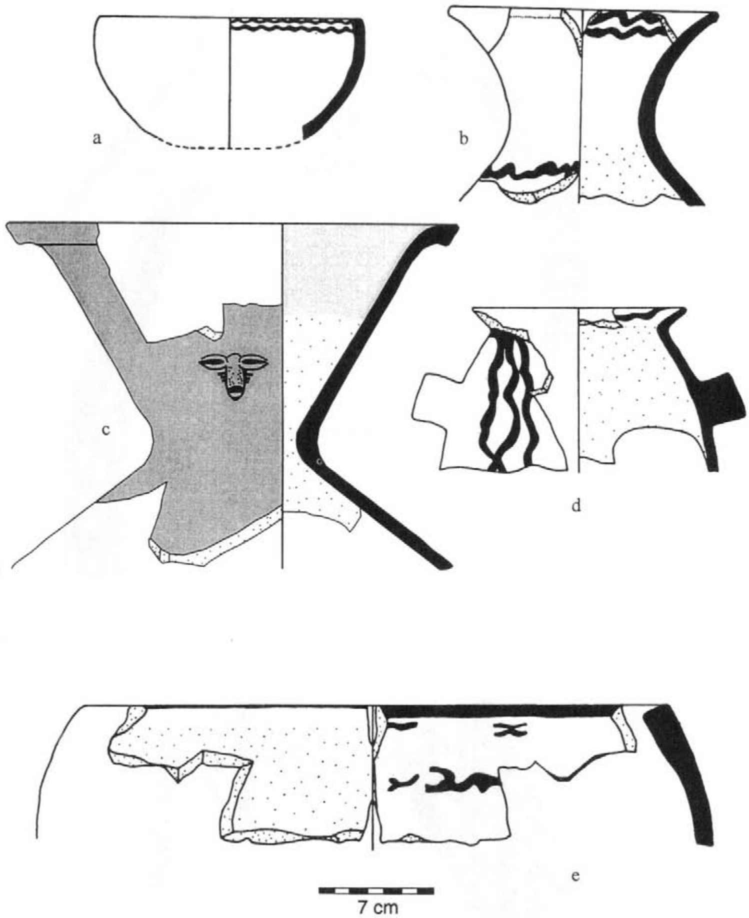

Figure 9.3. Base Clara and Wanka Red vessel forms: (a) hemispherical bowl: (b, c) high-neck jar fragments; (d) low-necked jar fragment: (e) deep basin fragment.

coarse, rounded to subangular limestone and other sedimentary inclusions. Cream Slip, first described by LeBlanc (1981), is a variant covered with light-grey or very pale brown slip, but otherwise undecorated. Base Clara may be unslipped or slipped in colors similar to Cream Slip. Both slipped and unslipped variants of Base Clara have similar decoration, most often straight, undulating, or cross-hatched lines on vessel neck, collar, or body (Figure 9.2). Paint colors vary from weak red through reddish- to dark-grey (cf. Lumbreras, 1957; Matos Mendieta, 1959; Lavallée, 1967; Browman, 1970, called this type Matapuquio). Wanka Red vessels, first described by LeBlanc (1 98 1), are covered with a weak or light-red wash. This may be applied directly on the paste surface or over a "cream" slip. Occasionally, Wanka Red vessels are also painted with reddish- to dark-grey designs similar to those of Base Clara.

These types were manufactured in a variety of jar and bowl forms. A small hemispherical bowl (Figure 9.3a) and a large, high-necked jar (Figures 9.3b,c) predominate in the assemblage. We also recovered globular low-necked jars (Figure 9.3d), similar in form to the cooking vessels, and deep basins (Figure 9.3e), probably used for serving. All three stylistic variants and forms were recovered in both Wanka II and Wanka III contexts. Base Clara comprised roughly 5% of the assemblage, Cream Slip, 11%, and Wanka Red, 5%.

Andesite-Tempered Wares

These wares are distinguished by their coarse-textured, red paste. Nonplastics are medium to coarse, angular fragments of andesite and its constituent minerals. Andesite wares come in two variants: slipped and unslipped. The unslipped variant is pebble burnished or rubbed to a low polish. The slipped variant, often called Base Roja (Lumbreras, 1957; Matos Mendieta, 1959; cf. Lavallée and Julien's [1983] "Black and White on Red" and Browman's [1970] "Arhuaturo"), is covered with a deep red slip and painted with complex black-and-white designs. Vessels are predominantly face-neck jars (Fig. 9.4a) and tall-necked jars (Fig. 9.4b). Decoration consists of black and white painted

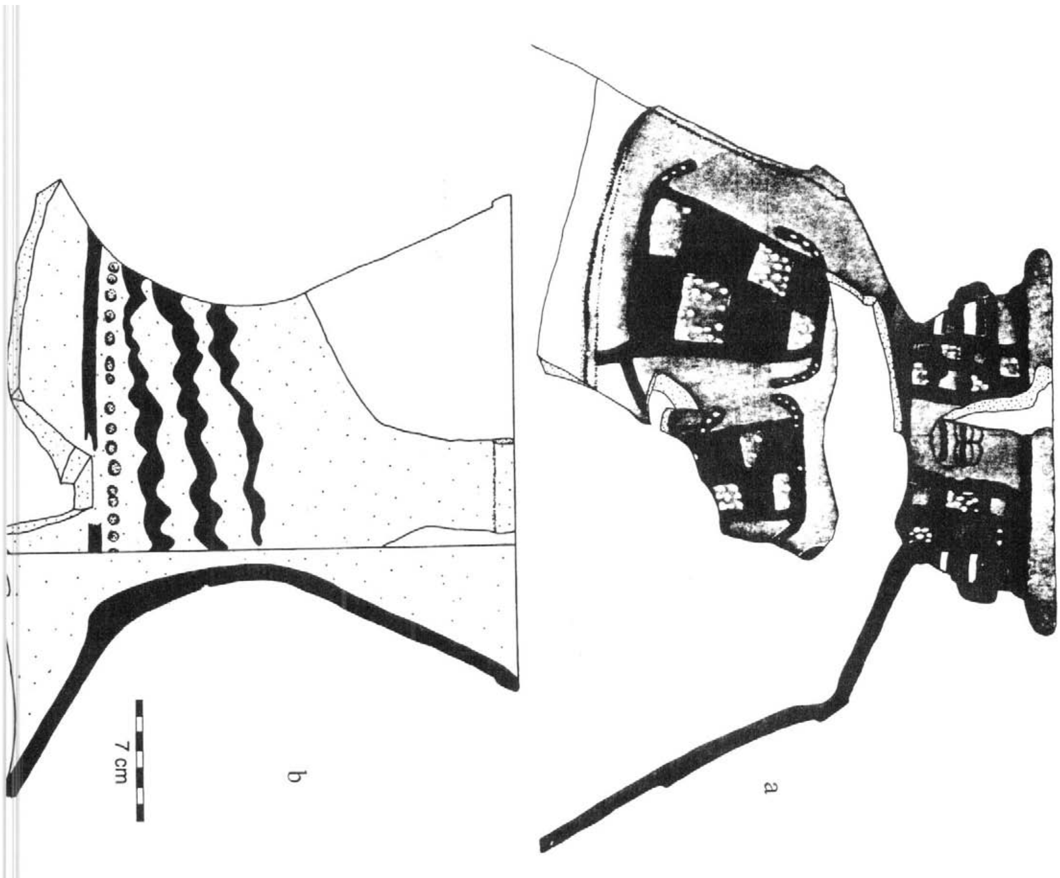

Figure 9.4. Andesite ceramics: (a) face neck jar fragment; (b) high-necked jar fragment.

motifs and plastic decoration, such as cane stamping and modeled appliques. The Andesite wares, recovered in both Wanka II and Wanka III contexts, comprise roughly 5% of the assemblage by weight.

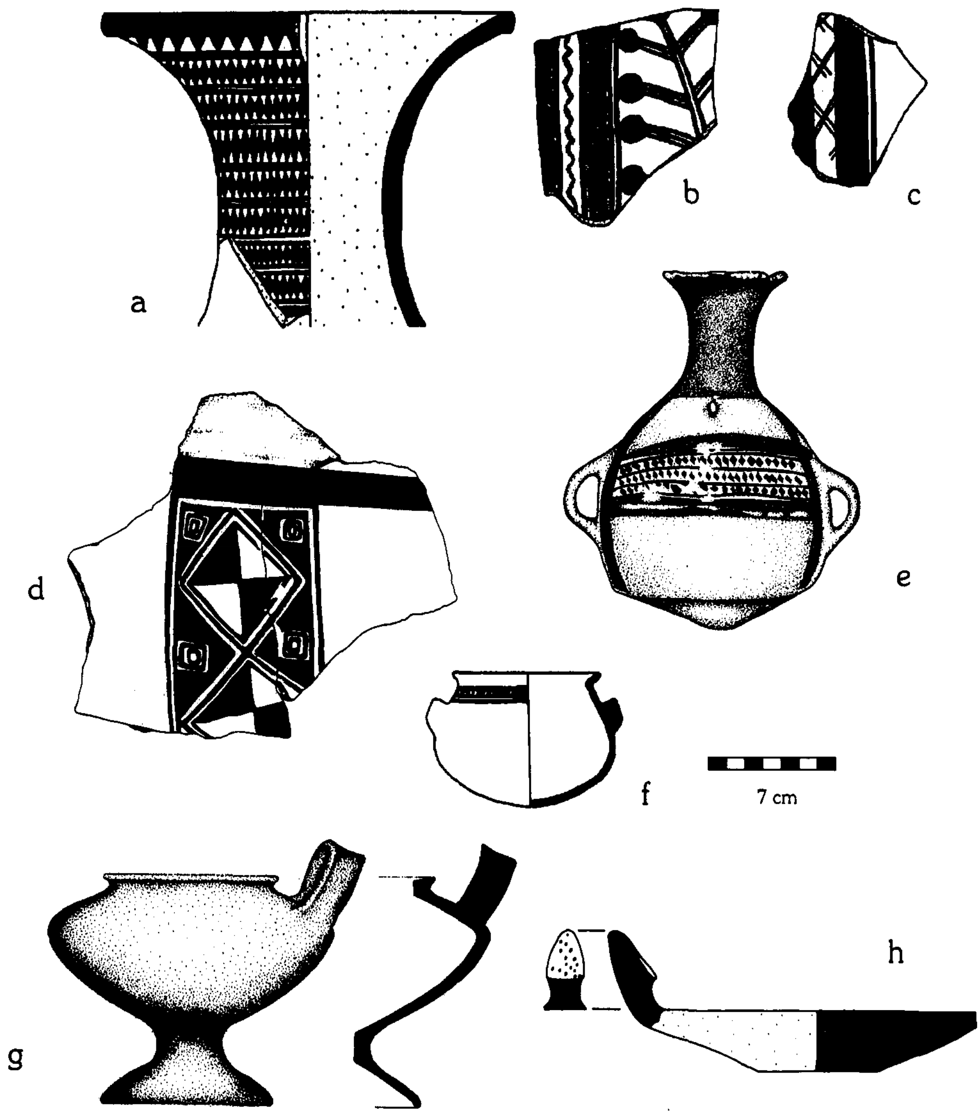

Figure 9.5. Inka ceramic forms: (a) flaring rim jar fragment; (b-d) body fragments; (e) whole miniature aryballoid jar; (9 closed bowl; (g) pedestal dish; (h) plate.

Inka

This type, described in detail in Chapter 10, is diagnostic of the Wanka Ill period. These vessels are manufactured more or less to state morphological and stylistic canons. The vast majority of stylistically Inka vessels were manufactured of a fine-grained, light-colored paste, with well-rounded quartz and sedimentary "sand" inclusions. Surfaces were always well finished to a medium or high polish and often slipped cream or red. A wide range of colors were used to paint geometric designs on the rim, neck, and vessel body (Figures 9.5a–d). The most common form was the aryballoid or flaring-rim jar (Figures 9.5a,e). Also manufactured were closed and pedestal dishes, plates, and keros (Figures 5f-h). Inka vessels comprised roughly 8% of the Wanka III assemblage.

DATA ANALYSIS

Several types of data proved useful in identifying the organization of ceramic production and the nature of exchange, and the ways in which they were analyzed are described here briefly.

Wasters

These are ceramics cracked during drying or broken, overfired, or collapsed during firing; or in some other way ruined during the production process such that they could not be used in their intended functions. Overfired sherds are the most easily recognized wasters in archaeological deposits. The UMARP assemblages from 1977–1979 and 1982–1983 contained 665 fragments identified as wasters by the presence of three or more of the following attributes: extreme discoloration as a result of iron reduction and carbon trapping; extreme hardness (> Moh 3); vitrification; and blistering, pocking, warping, bloating, and slumping (Figure 9.6). Although there are other kinds of wasters, in the remaining discussion, the term "waster" refers only to these obviously misfired sherds.

The presence of a few wasters is not adequate evidence for production at a particular location. Irregularities in primitive firings may cause localized hotspots, so that a part of the vessel will appear overfired, while the vessel as a whole remains functional and would not have been discarded (cf. Rye, 1980:Figure 9.97). Therefore, it is preferable to compare the number of wasters to the frequencies of the types used. The specific ratio used here is the waster index, calculated by dividing the number of wasters by the number of sherds and multiplying by 100 (because the numbers are so small):

$$\text{Waster index} = \frac{\text{Number of wasters}}{\text{Number of sherds}} \times 100$$

Because the presence of wasters directly identifies the actual location of production, the distribution of wasters reflects on all three issues of interest in the organization of production. Wasters can be used to identify (1) local production, (2) the types produced

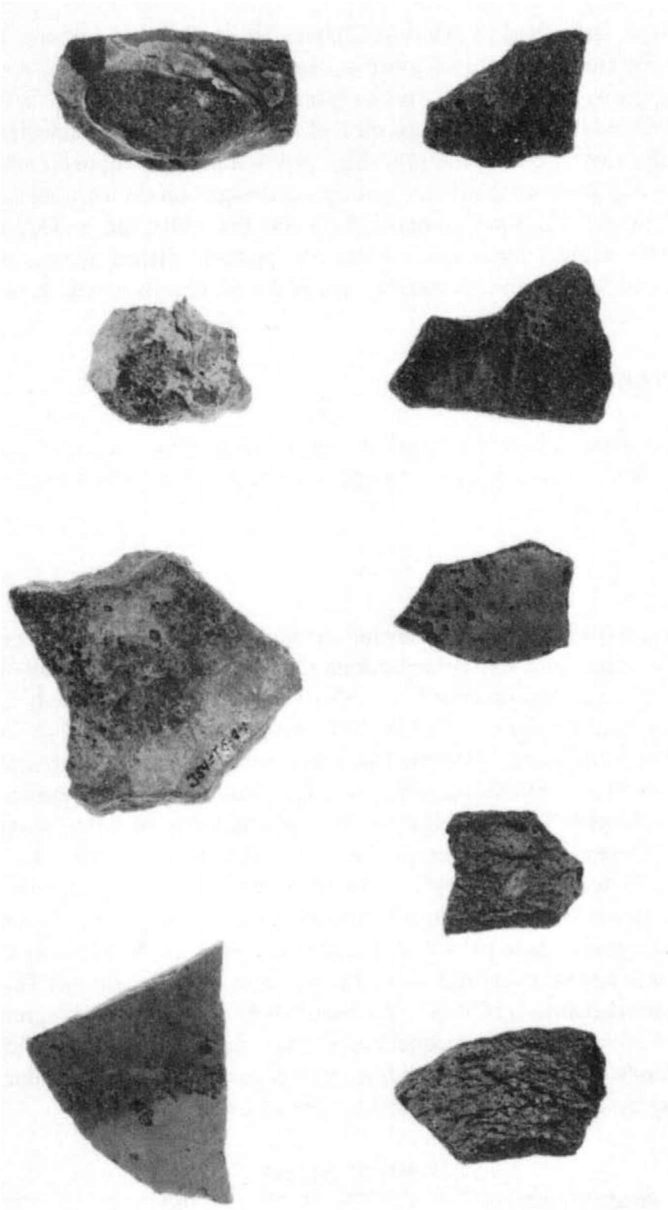

Figure 9.6. Photograph of ceramic wasters.

locally, and (3) through their architectural associations all four of the parameters that describe the organization of production.

Homogeneity in Raw Materials

A basic assumption is that when ceramics are materially and technologically similar, they were most likely produced in the same place, whereas ceramics that differ significantly in these attributes were produced in different locations (Peacock, 1970; Fry, 1980; Rands and Bishop, 1980). Because ofthis, the relative homogeneity ofmaterials is used to identify analytically useful units—such as households, sites, or regions—served by the same production group. Thus, these data are used to identify indirectly the relative concentration of production.

To assess the mineralogical makeup ofthe Yanamarca assemblage, 23 variables relating to paste and inclusions were recorded on a subsample ofnearly 6000 sherds representing all major types and vessel forms (Costin, 1986:159ff.). A combination ofprincipal components analysis, cluster analysis, and canonical discriminant analysis was used to analyze variability. First, the SAS Macro, PRINQUAL, was used to reduce the dimensions of variation among the observations (Kuhfield, Sarle, and Young, 1985; Young and Kuhfield, 1985). Scores on several ofthe principal components were plotted against one another and visually inspected for “meaningful”groupings ofsherds: clustering by household, site, type, style, vessel form, status, or some other archaeologically recognized analytic unit. Second, principal component scores were input into the SAS procedure, PROC FASTCLUS, to cluster the data systematically (SAS Institute, 1982:433–477). Again, clusters were analyzed for “meaningful” groupings. Finally, a canonical discriminant analysis (SAS procedure PROC CANDISC [SAS Institute, 1982:369–380]) was used to identify the variables that discriminate among the clusters identified through PROC FASTCLUS.

Morphological and Technological Standardization

Within the technological limits of functional necessity and the constraints created by social expectations, vessel standardization generally reflects the relative number of potters working within a particular production system (Hagstrum, 1986; Costin, 1991; Costin and Hagstrum, 1995). This is the case for two reasons. First, the experience and routinization that come with practice of a specialized craft result in each potter producing a more highly standardized body oftypes (Hagstrum, 1986). Second, because fewer potters are employed, a specialized system will introduce less idiosyncratic behavior? and therefore less idiosyncratic variation, into the assemblage (van der Leeuw, 1976; Rice, 1981). I argue that the relative amount of standardization reflects the parameters of concentration and production-unit constitution. The products of nucleated specialists should be more standardized than the products of dispersed specialists. This is the case because workers aggregated within a single community are more likely to draw from the same or similar raw material sources, to participate in ad hoc sharing of facilities, to exchange tools and labor, and to have general access to each others’ products. Similarly, the products of workshops should be more standardized than the products of individual specialists because workshop artisans generally work in close proximity, under supervision, and share raw materials and technology.

The present study evaluated standardization through examination of morphological and technological characteristics believed to be independent of vessel function. For the

Table 9.1. Shannon–Weaver Diversity Scores (H') on Color Variables

		Paint		Slip		
	Paste	Red	Black	Red	Cream	Mean H'
WANKA II						
Micaceous Self-slip	1.40 (*N* = 967)					
Xauxa wares[a]	1.14 (*N*= 1659)	1.19 (*N*=237)	1.00 (*N*=326)	0.97 (*N*= 166)	0.92 (*N*= 1,031)	1.04
Andesite	1.25 (*N* = 379)		0.87 (*N*= 58)	1.04 (*N*= 103)		1.05
WANKA III						
Micaceous Self-slip	1.34 (*N*= 552)					
Xauxa wares[a]	1.19 (*N*=941)	1.08 (*N*= 172)	0.90 (*N*=256)	1.02 (*N*=57)	0.91 (*N*=581)	1.02
Andesite	1.31 (*N* = 289)		0.78 (*N* = 49)	1.04 (*N* = 68)		1.04
Inka	1.05 (*N*=400)	0.93 (*N*= 119)	0.97 (*N*= 133)	1.02 (*N*= 116)	1.13 (*N*= 108)	1.02

Note. Shannon–Weaver diversity score (H') calculated as follows: $H' = \Sigma p_i \log p_i$

[a] Base Clara and Wanka Red analyzed together for paste and black paint, separately for red paint and slip.

morphological variables of rim and collar diameter, a coefficient of variation was used to assess standardization. For variation in color, as measured using a standard Munsell color chart, a Shannon–Weaver Diversity Index (Shannon and Weaver, 1963; Pielou, 1966a, 1966b) was calculated to measure the amount of unintentional randomness present in the formulation of specific colors (see Costin and Hagstrum, 1995). The implications of the results of these analyses for reconstructing the organization of production are discussed below; I comment briefly on the general trends here.

There is surprisingly little difference in the diversity of the color palettes used in the manufacture of all the types. Table 9.1 illustrates that there is no consistent patterning in the diversity scores by color among the types when all the variables are considered individually. To get a rough idea whether one type is more diverse than the others overall, I calculated a mean diversity index for each type. No "mean" score could be calculated for Micaceous Self-slip because it is represented by a single variable: paste color. Turning to the decorated types, the composite diversity scores are virtually identical, ranging from 1.02 to 1.04. Therefore, I conclude that in terms of color variables, all the types analyzed had similar levels of diversity.

The second measure of standardization used was the coefficient of variation in rim diameter, collar diameter, and wall thickness 3 cm below the shoulder for jars, and 3 cm

Table 9.2. Coefficients of Variation on Metric Attributes

	Rim Diameter		Collar Diameter		Wall Thickness[a]	
	WII	WIII	WII	WIII	WII	WIII
JARS						
Andesite high-necked	19.3[b]	14.1[b]	13.9[b]	21.8[b]	68.2[b]	
lnka aryballoid		30.0		30.3[b]		
Loca[d] low-necked	22.7	24.5	25.1	27.2	22.3	19.0[c]
Local[d] high-necked	33.2	22.9	57.6	33.1[b]	25.5	05.1[b]
Micaceous cooking olla	18.9	23.2	21.3	27.2	25.8	26.6
BOWLS						
lnka bowl		19.3				21.7
Local[d] bowl	28.1	35.9			24.8	23.3
Local[d] basin	33.1	25.5			27.1	32.9

Note. $C.V. = \frac{st.d. \times 100}{\bar{x}}$

[a] Measured 3 cm below the collar for jars and 3 cm below the rim for bowls.
[b] N < 10
[c] N < 3
[d] "Local"= Base Clara, Wanka Red, and Cream Slip.

below the rim for bowls. The results of the analysis are presented in Table 9.2. Among the jar types, Andesite consistently has among the lowest coefficients of variation, suggesting this type was the most standardized in terms of vessel dimensions. Next most standardized was Micaceous Self-Slip, with low-to-average coefficients of variation for all attributes. Local jars—with high- and low-necked varieties analyzed separately—have higher scores, indicating less standardization. Surprisingly, Inka aryballoid jars consistently received high scores, indicating the type is more variable in terms of vessel size than most of the local types. In contrast, the Inka bowls had the lowest coefficients of variation for all attributes recorded for bowls. The significance of these results for reconstructing the organization of production is addressed later.

Labor Investment

Labor investment reflects manufacturing costs as measured by the time spent in producing a commodity (Costin and Hagstrum, 1995). This technological characteristic of the pottery should reflect the context of production. With certain caveats (Costin, 1991; Costin and Hagstrum, 1995), I expect that vessels produced by independent specialists for general utilitarian consumption will be lower in labor investment than goods produced by attached specialists. The products of independent specialists usually reflect the cost constraints of a competitive economic system (cf. Clark, 1986; Hagstrum, 1986; Torrence, 1986; Gero, 1989). Goods produced specifically for elite consumption almost always encode significant levels of social and political information, which requires greater energy

Table 9.3. Wares Ranked by Median Labor Investment Scores

	Median	Minimum	Maximum
Jar Rims			
Andesite	11	3	16
Inka	10	2	15
Base Clara	7	3	11
Wanka Red	7	2	12
Micaceous Self-slip	6	1	12
Cream Slip	5	1	11
Bowl Rims			
Inka	12	3	15
Wanka Red	7	3	12
Base Clara	7	3	12
Cream Slip	5	2	9
Basin Rims			
Wanka Red	8	3	11
Base Clara	7	2	11
Cream Slip	5	2	10
Body Sherds			
Inka	8	3	14
Andesite	6	1	12
Base Clara	5	1	13
Wanka Red	5	2	14
Cream Slip	5	2	9
Micaceous Self-slip	4	1	10

Note. Attributes used in the analysis and points assigned are listed in Costin (1986:Table 4.11).

expenditure in their production (Earle, 1982; Pollock, 1983; Hagstrum, 1989; Clark and Parry, 1990; Costin, 1991).

Labor investment was measured using a production step index (Feinman, Upham, and Lightfoot, 1981). Based on general studies of ceramic production and Hagstrum's (1989) ethnographic among potters in the Mantaro Valley, I developed a production step measure to quantify the labor invested in the manufacture of the various types used in Wanka households. Production tasks were ranked by the relative amount of time required to carry them out, and proportional numbers of points were assigned for each task (Costin, 1986:Table 4.11). Different vessel forms, rims, and bodies were analyzed separately.

The results of the labor investment analysis are presented in Table 9.3, where the styles are ranked by their median labor investment scores within forms. The implications for the organization of production are discussed later, but a few comments are in order here. First, Inka vessels are generally the most labor intensive of the major types recovered in Wanka households, only ranking lower than Base Roja jar rims. This reflects the fact that most Base Roja jar rims were elaborately painted and appliquéd, whereas many Inka rims carried a relatively simple painted design, such as a single band of color at the lip (compare Figures 9.4a and 9.5a). In all other categories—notably bowl rims and body sherds—Inka ranks as the most labor intensive of the ceramic types. Second, Base Clara and Wanka Red have extremely similar scores in all shape categories. They are more labor intensive than the related type, Cream Slip, which is to be expected, given that Cream Slip lacks painted embellishment. Finally, although Micaceous Self-slip ranks among the lowest of the types in labor investment, it is not always the lowest ranked type, which might be expected given that all the other styles are decorated in some way. The Micaceous Self-slip jar rims ranked higher than the Cream Slip jar rims, even thought the latter are decorated. This reflects the greater care taken in the manufacture of the cooking ware and, specifically, the method of rim formation (see Hagstrum, 1989). Most importantly, a carefully smoothed interior was needed in the cooking ware in order to improve its functional qualities, such as providing a "no-stick" surface on the interior of the vessel.

Skill

I expect a correlation between the intensity of production and the relative proficiency or skill of the craftsperson for two reasons. First, artisans who spend more time at their work, and those who work without significant hiatus, are expected to be more competent at their tasks because of increased repetition and experience (Hagstrum, 1985; Clark n.d.). Second, I expect that full-time, rather than part-time, labor will be recruited for those industries that require greater skill and training, because it is more efficient to train relatively fewer workers.

Skill was measured as consistency in several production steps. Variation in vessel wall thickness was analyzed as a reflection of control in vessel forming technique (see Costin and Hagstrum, 1995 for a complete discussion). Inka vessels scored highest in this analysis, exhibiting greater consistency in wall formation than either Micaceous Self-slip or Base Clara/Wanka Red (which were analyzed together) (Figure 9.7). Andesite sherds were not included in this analysis.

The relative presence or absence of a firing core was used as a rough indicator of the level of control and consistency in firing. The results indicate that the makers of Micaceous Self-slip demonstrated the greatest degree of control in firing, followed only sightly by the artisans responsible for the production of Inka pottery (Table 9.4). Large proportions of Andesite, Base Clara, and Wanka Red sherds retained grey cores. The producers of these types may have been less skillful than those making Micaceous Self-slip and Inka, or the consumers of Andesite, Base Clara, and Wanka Red may have been less concerned about or more tolerant of variation in control over the firing process (and its functional correlates).

PRODUCTION: LOCAL OR NONLOCAL?

Distinguishing among locally and nonlocally produced types was accomplished in two steps. In the first, I determined which ceramics were the products of the same production location, and which were clearly derived from different sources. In the second step, I analyzed concentrations of ceramic production debris to identify the pottery produced at Xauxa communities within the Yanamarca.

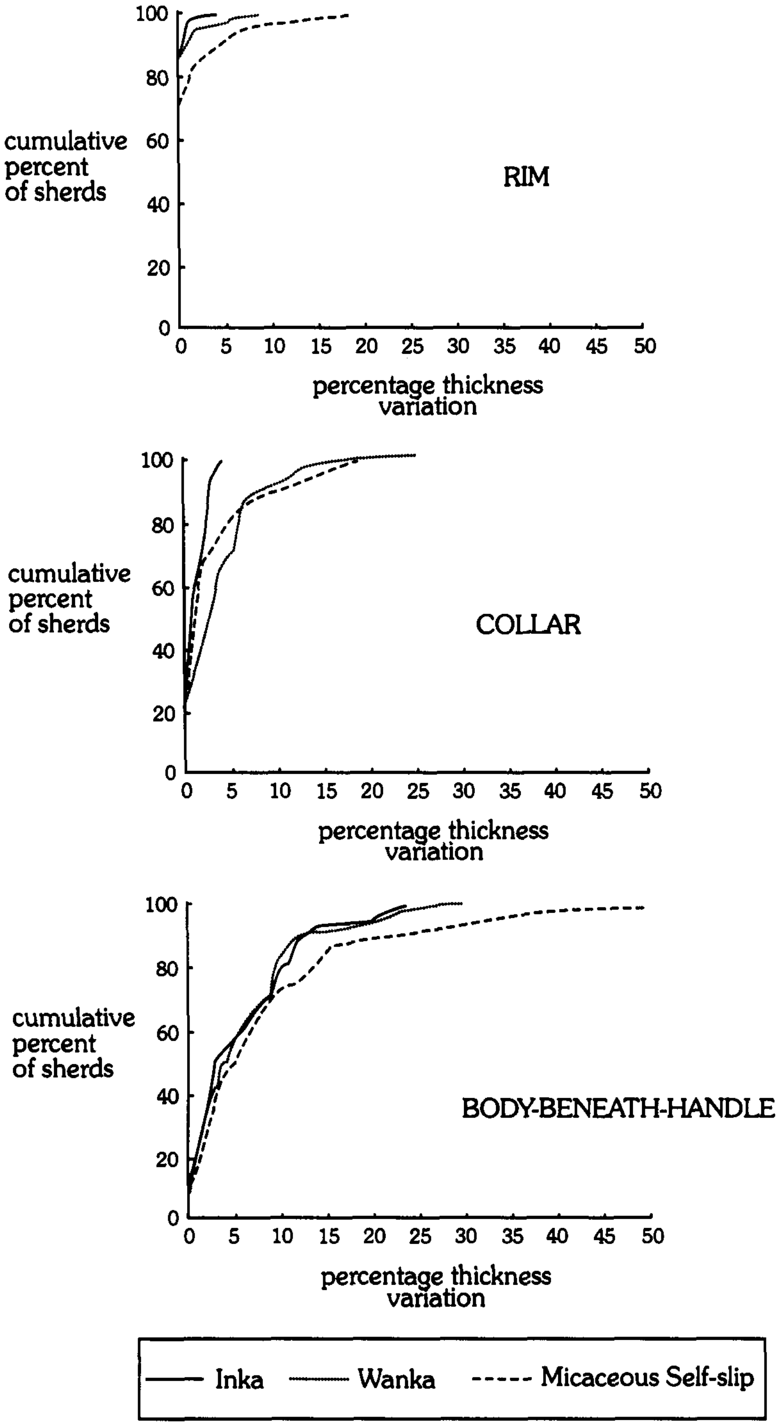

Figure 9.7. Chart illustrating variation in wall thickness.

Figure 9.8. Schematic representation of principal components analysis illustrating paste clusters. Principal component 1 reflects color, paste texture, and the relative abundance of muscovite and grey aphanitic lithic fragments. Principal component 2 reflects the relative abundance of andesite and biotite inclusions. Principal component 3 reflects the overall proportion of inclusions and the relative abundance of materials expected from a sedimentary environment, especially compact red clay pellets and rounded red quartzgrains. (a) Principal components 1 and 2, distinguishing among Andesite, Micaceous Self-slip and Base Clara/Wanka Red/Cream Slip/Inka; (b) principal components 1 and 3, distinguishing among Micaceous Self-slip, Inka, and Base Clara/Wanka Red/Cream Slip.

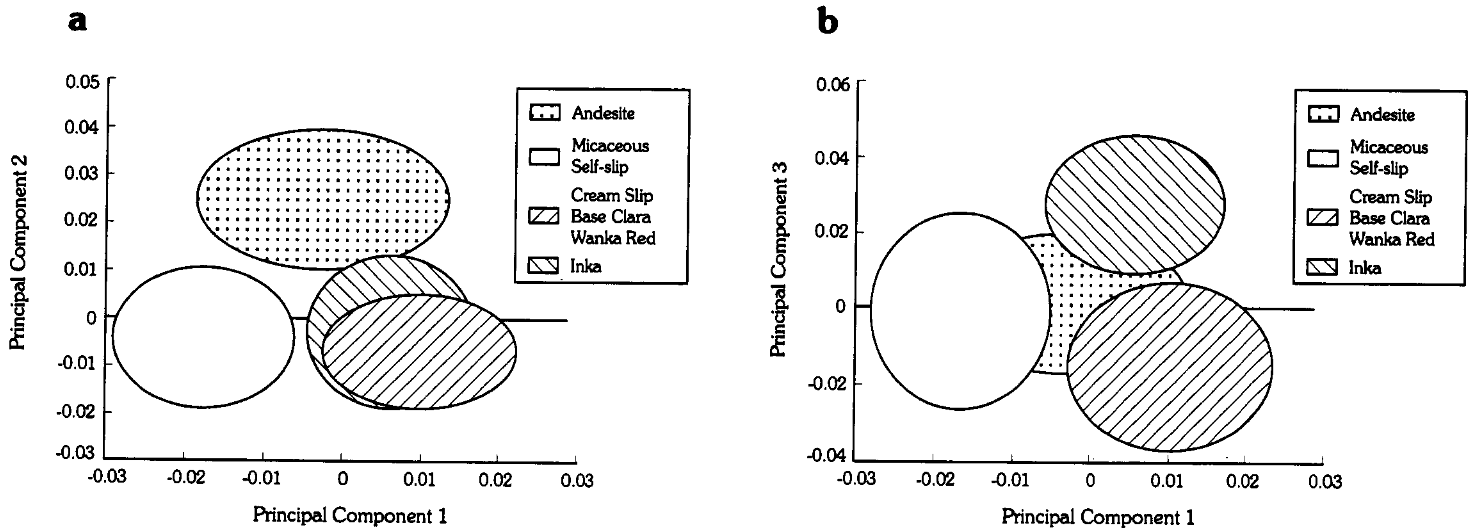

Table 9.4. Percent of Sherds with Incomplete (Grey) Firing Core

	Wanka II	Wanka III
Micaceous Self-slip	88	89
Inka	—	83
Local[a]	52	63
Andesite	44	45

[a] Base Clara, Cream Slip, and Wanka Red analyzed together.

As discussed earlier, ceramics similar in their composition are expected to be derived from the same source or production group. When all the sherds in the detailed analysis were analyzed together, some clear patterns emerged. Based on their composition and mineralogy (Costin, 1986:153ff.), Micaceous Self-slip and Andesite wares were easily distinguished from one another and from the other types. Base Clara, Cream Slip, and Wanka Red were virtually indistinguishable from one another but quite different from Micaceous Self-slip and Andesite. Inka sherds were less easy to separate from the Base Clara/Wanka Red/Cream Slip group, but they are distinctive enough to warrant placing them in a separate group (Figure 9.8). I concluded that each of the ceramic types was produced by a separate "production group."

The second step in the analysis was to determine specifically which types were produced at the local Xauxa communities and which were not produced locally. Concentrations of ceramic wasters are the best evidence for determining on-site pottery production. Because wasters rarely move far from production loci, the recovery of wasters indicates nearby production, minimally somewhere in the community where they are recovered. Types for which wasters were recovered consistently at a particular site can be inferred to have been produced at that site. Types for which wasters were commonly recovered at any Yanamarca site can be inferred to be the products of local potters.

Nearly one-third of the wasters recovered could not be identified by ware or style. Among those that could be classified by style or ware, virtually all (96.9%) were from three types: Base Clara, Wanka Red, and Cream Slip. Even more than raw counts, a waster index, or ratio of wasters to consumed sherds, allows identification of locally produced types. Those with a relatively high waster index (many wasters relative to total numbers of sherds recovered) are interpreted as locally produced, while those with low wasters indices (few or no wasters relative to the amount of pottery used) cannot be positively identified as local products using this technique.

As Figure 9.9 illustrates, Base Clara, Cream Slip, and Wanka Red have relatively high waster indices, whereas Andesite, Inka, and Micaceous Self-slip have low waster indices. The immediate conclusion to be drawn from these data is that Base Clara, Cream Slip, and Wanka Red were produced locally, while Andesite, Inka, and Micaceous Self-slip were not. It was necessary, however, also to consider the possibility that Inka, Micaceous Self-slip, and Andesite wares would not produce overfiring wasters, as defined earlier, and therefore would not enter into the analyses as wasters. 1 conducted a refiring experiment to test this possibility. The experiment demonstrated that highly micaceous clays, such as those used to produce Micaceous Self-slip, do not "waste" at temperatures normally reached in open firings (Costin, 1986:181-187). In contrast, clays derived from andesitic sources such as

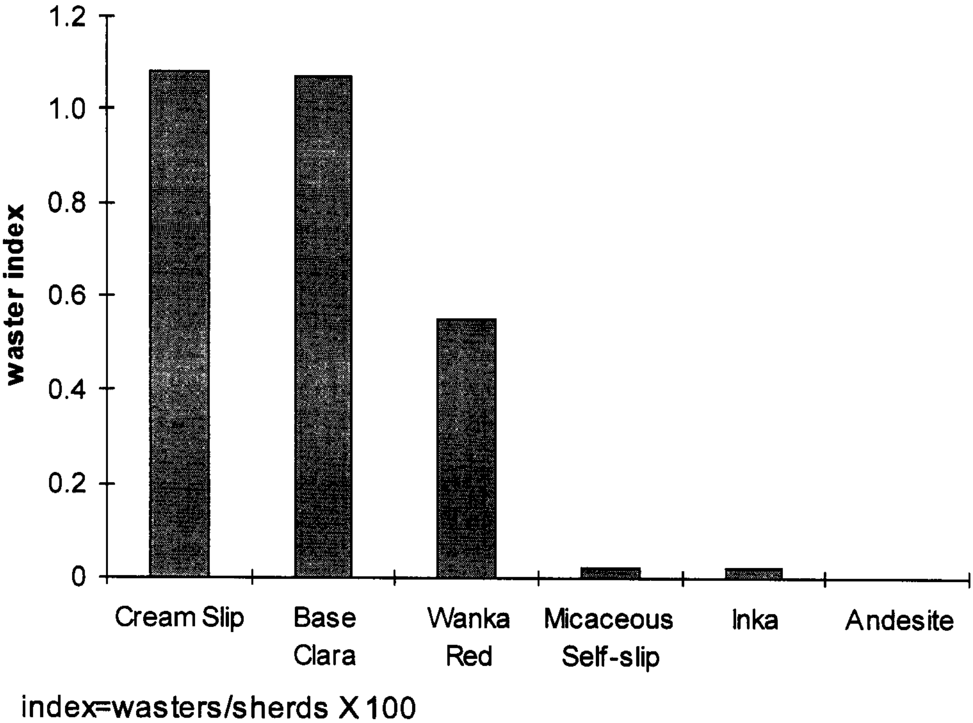

Figure 9.9. Bar chart of waster indices calculated by ceramic type. Types with high waster indices are inferred to be locally produced.

those used for Andesite wares and sedimentary clays high in carbonates, such as those used to make Inka pottery, will "waste" in the expected ways. Given these experimental data, the low waster index of Micaceous Self-slip cannot be used to infer nonlocal production. In contrast, given that Andesite and Inka wares are expected to "waste," their low waster indices clearly indicate nonlocal production.

An additional line of evidence suggests that Micaceous Self-slip may have been a locally produced type. UMARP excavations in 1978 at the site of Tunanmarca uncovered a highly unusual ceramic dump. A 1 x 3 m test pit (with a volume of only 0.9 m^3) yielded over 16,000 sherds. Despite the extremely high number of sherds, no wasters of Base Clara, Cream Slip, or Wanka Red were recovered. Micaceous Self-slip cooking pots comprise 53.4% of the assemblage of the dump, significantly more that in either elite (20.1%) or commoner (34.2%) *household* contexts. Furthermore, none of the cooking jars recovered from the dump had carbonized encrustations, a clear sign of use. Again, this contrasts significantly with cooking jars recovered from household contexts (Costin, 1986:191). Finally, we have some evidence that the dump was associated with firing. The soil matrix of the trench was quite ashy. I cannot identify the dump as a primary firing area, because no hearths, large firing pits, or burnt earth were recovered in the immediate vicinity. However, it appears that the debris recovered in the trench represents a midden associated particularly, but not exclusively, with ceramic production.

In summary, the waster data indicate clearly that Base Clara, Wanka Red, and Cream Slip are locally produced ceramics. The absence of Micaceous Self-slip wasters does not conclusively demonstrate that this type was imported, because this clay does not produce characteristic wasters when fired at temperatures attainable by Xauxa potters. Rather, I argue on the basis of materials recovered from a dump at Tunanmarca that Micaceous Self-slip is also a locally produced Xauxa ceramic type. In contrast, the absence of wasters of lnka and Andesite wares argues for the production of these types outside the study area, because wasters of these types are expected given temperatures attainable by Xauxa potters.

PRODUCTION: GENERALIZED OR SPECIALIZED?

The second issue of concern was whether the production of local ceramic types was a generalized, panhousehold activity or a specialized economic activity pursued by a limited number of specialists. Specialized production is an activity carried out by relatively fewer individuals or households than those that are consumers of the goods in question. There are two implications for the data analysis. First, specialized production can be identified archaeologically through the unequal distribution of production debris. In contrast, generalized production—or the domestic mode of production (Sahlins, 1972), where every household produces only for it own use—is identified by a relatively equal distribution of this production debris. Thus, the distribution of production debris is a direct indicator of the organization of production.

Second, more highly specialized industries will often have certain characteristics—such as greater standardization and higher levels of skill—than less specialized industries (Costin, 1991 ; Costin and Hagstrum, 1995). These characteristics are more indirect indicators of the organization of production. They can be used to corroborate conclusions drawn from the analysis of the direct measures and are especially useful when direct evidence for production is lacking in the assemblage, as it is for Micaceous Self-slip, Andesite, and Inka wares. Most fundamentally, these data provide evidence for the relative number of work groups manufacturing a particular type of pottery. I was fortunate to compare the degree of standardization and levels of proficiency of Micaceous Self-slip, Andesite, and lnka wares with those of Base Clara/Wanka Red/Cream Slip, which I know were the products of specialists.

The first analysis of the organization of production used a waster index calculated by household to determine the relative amount of ceramic production in Wanka households. A relatively random or equal distribution of waster indices among households indicates the domestic mode of production. In contrast, an unequal distribution of production debris relative to use indicates economic specialization, as those households that lack evidence for production are primarily ceramic consumers, while others both produce and use pottery. Figure 9.10 illustrates that waster indices vary greatly by household. Thus, I conclude that there was some specialization in the production of the local Wanka types in both Wanka II and Wanka III.

Indirect evidence also provides some information on the relative degree of specialization in the Yanamarca ceramic industries. As the data in Figure 9.7 and Tables 9.1, 9.2, and 9.4 illustrate, the five types are remarkably similar in most measures reflecting standardization

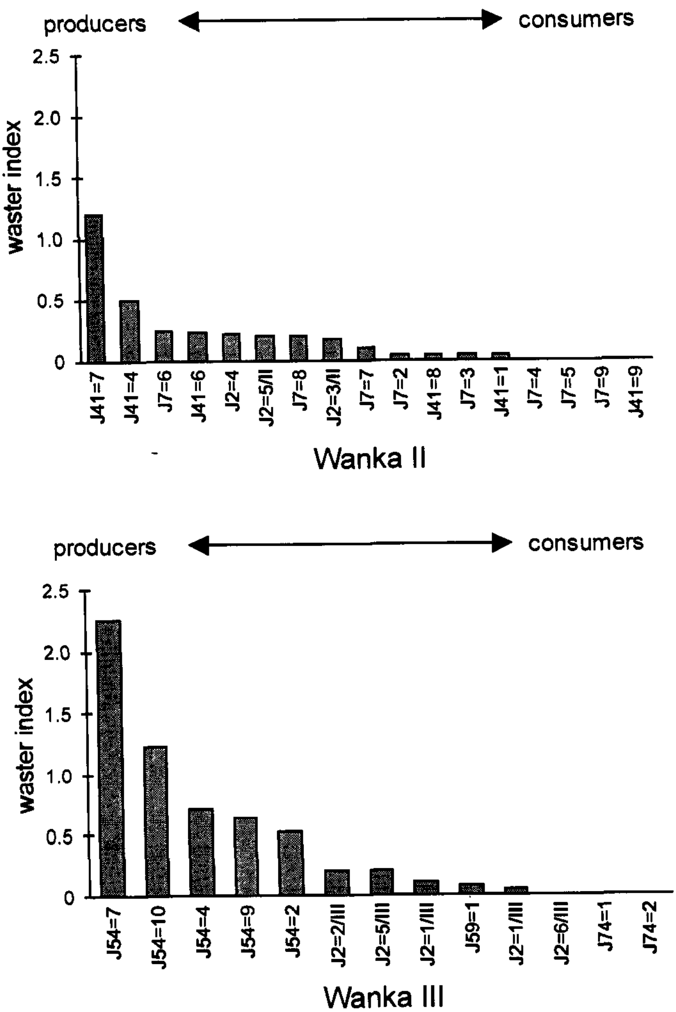

Figure 9.10. Bar chart of waster indices calculated by household for each phase. Households with high waster indices are inferred to be potting households, while those with low waster indices are identified as ceramic consumers.

and proficiency. There are no extreme difference that might indicate radically different degrees of specialization—or numbers of producers—for any of the ceramic types.

Although all the types recovered in Xauxa households were apparently the products of specialists, this does not mean that the production of all ceramics used in Xauxa households was organized in a similar way. Rather, given the different functions and contexts of the different types, it seemed likely to me that several types of specialization would have existed among the Xauxa. Resolving this issue was the focus of the third part of the ceramic analysis.

LOCAL PRODUCTION AND EXCHANGE

I now turn to the specific organization of production of each of the local ceramic types used by Xauxa households.

Production: Base Clara, Cream Slip, and Wanka Red Serving and Storage Vessels

Many lines of evidence contribute to the understanding of the specific organization of production of these types. The data include direct evidence, such as the distribution of wasters and tools, and indirect evidence, such as homogeneity in the raw materials used, standardization of technology, labor investment, and the relative amount of skill manifested.

Context of Production

Attached production is easiest to identify through the association of production activities with elite or special-purpose architecture (Costin, 1991:25–27). Therefore, I first analyzed the relative concentration of debris in elite and commoner contexts. To do this, a waster index was calculated by status. In both Wanka II and Wanka III, ceramic production was more frequent in commoner patios (Figure 9.11). The relationship between ceramic production debris and commoner households was evaluated with a chi-square statistic and found to be statistically significant at the 0.01 level in both periods. Thus, production of the locally produced ceramic types does not appear to be an activity directly supervised or controlled by elites in either period.

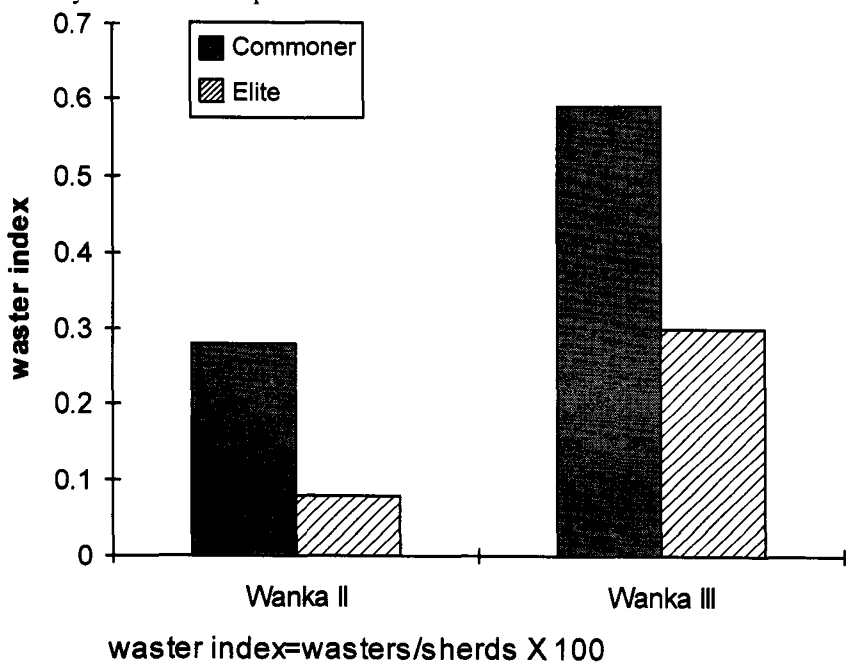

Figure 9.11. Bar chart of waster indices calculated by status for each phase. Relatively higher concentrations of wasters in commoner households indicate independent specialization.

The conclusion that Base Clara, Cream Slip, and Wanka Red were made by independent specialists is supported by the technological characteristics of the objects. The products of attached specialists are expected to manifest high amounts of labor investment and skill (Hagstrum, 1986, 1989; Costin and Hagstrum, 1995; cf. Pollock, 1983; Gero, 1989). The production step index indicates the three types had relatively low labor investment (Table 9.3; cf. Hagstrum, 1989; Costin and Hagstrum, 1995). Firing features and consistency in only moderate levels of skill or control over the production process (Tables 9.1 and 9.4). In summary, the technological evidence supports the conclusion that these three types were most likely the products of independent specialists.

Concentration of Production

A waster index calculated by site can be used to distinguish between individual, within site specialization, in which each settlement supports one or more ceramic specialists who produce for distribution at that site only, and community specialization, in which many of the inhabitants of a single settlement produce a particular good for consumers at many other settlements. In the first case, all sites should have similar waster indices, because no site, as a whole, will produce more ceramics than it consumes. In the second case, I expect a multimodal distribution of waster indices at the site level, because the amount of production debris will vary between ceramic-producing (exporting) and ceramic-consuming (importing) communities.

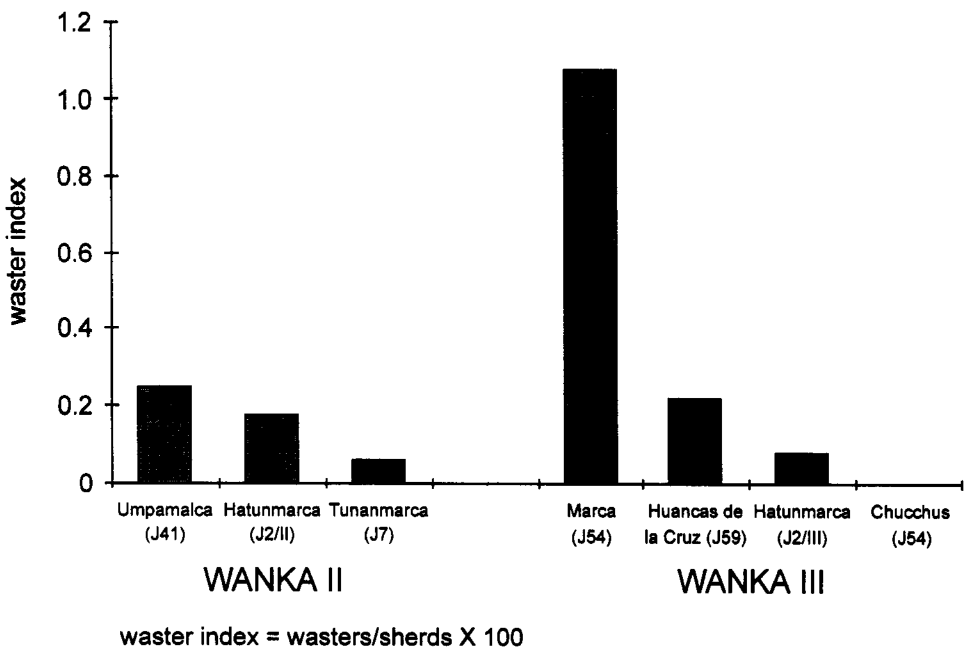

Figure 9.12. Bar chart of waster indices calculated by site for each phase. Sites with relatively higher concentrations of wasters are inferred to be communities specializing in ceramic production.

In Wanka II, households with high waster indices (indicating they are pottery producers as well as consumers) are concentrated at Umpamalca, whereas those with low waster indices are found primarily at Tunanmarca. Households at Hatunmarca have moderate scores (Costin, 1986:Table 7.3). When waster indices are calculated for each site as a whole, Umpamalca has a relatively high index, Tunanmarca has a low index, and Hatunmarca has a moderate index (Figure 9.12). The differences among the sites were evaluated using a chi-square test and are statistically significant at the 0.0001 level. From this evidence, I conclude that ceramic production was specialized at the community level in Wanka II, with production concentrated at Umpamalca and Hatunmarca.

The paste analysis supports the conclusion that several separate production groups served the Xauxa population in Wanka II. The raw materials used to produce these types were similar to one another. A plot of scores on the canonical variables, however, reveals that sherds from Hatunmarca tend to fall on one side of the cluster, whereas those from Tunanmarca and Umpamalca tend to fall on the other (Figure 9.13a). These paste differences—albeit subtle—support the conclusion that two distinct production groups served the Wanka II population.

The pattern of waster distribution by site in Wanka III is even more striking than that of Wanka II. As in Wanka II, households with high waster indices are concentrated at one settlement (Marca), while those with low waster indices are found at the other sites (Hatunmarca, Wankas de la Cruz, and Chucchus; Costin, 1986:Table 7.4). Marca has a high sitewide waster index, Huancas de la Cruz has a moderate score, and Hatunmarca and Chucchus have low scores (Figure 9.12). The Huancas de la Cruz waster index may be artificially high, as three of the four wasters found at the site were recovered from a single deposit of wall fall and may reflect an isolated find. Given these data, I conclude that ceramic production was organized at the community level in Wanka III, with potters at Marca supplying the bulk of the local-style serving and storage vessels to the other three communities.

The interpretation of a single source for this pottery in Wanka III is supported by the analysis of the materials used in production. A plot of the scores on the canonical variables indicates all households received their pottery from a singe "source" (Figure 9.13b). Interestingly, the ceramics from this source are petrographically quite similar to those produced by the "Hatunmarca group" in Wanka II (Costin, 1986: Figure 8.8). This strongly suggests that in the economic reorganization of Wanka III, some elements of the southern production system—whether potters themselves or simply the clay sources they had used—continued to operate, although the locus of production switched to the newly founded community of Marca. In contrast, the northern production system, centered at Umpamalca, fell out of use when that site was abandoned.

Composition of Production Units

Given that all the debris was recovered from domestic contexts, I identify this as household, rather than workshop, production. None of the households with high waster indices had any special-purpose facilities indicating that production was carried out by a relatively small group within the confines of the residential compound.

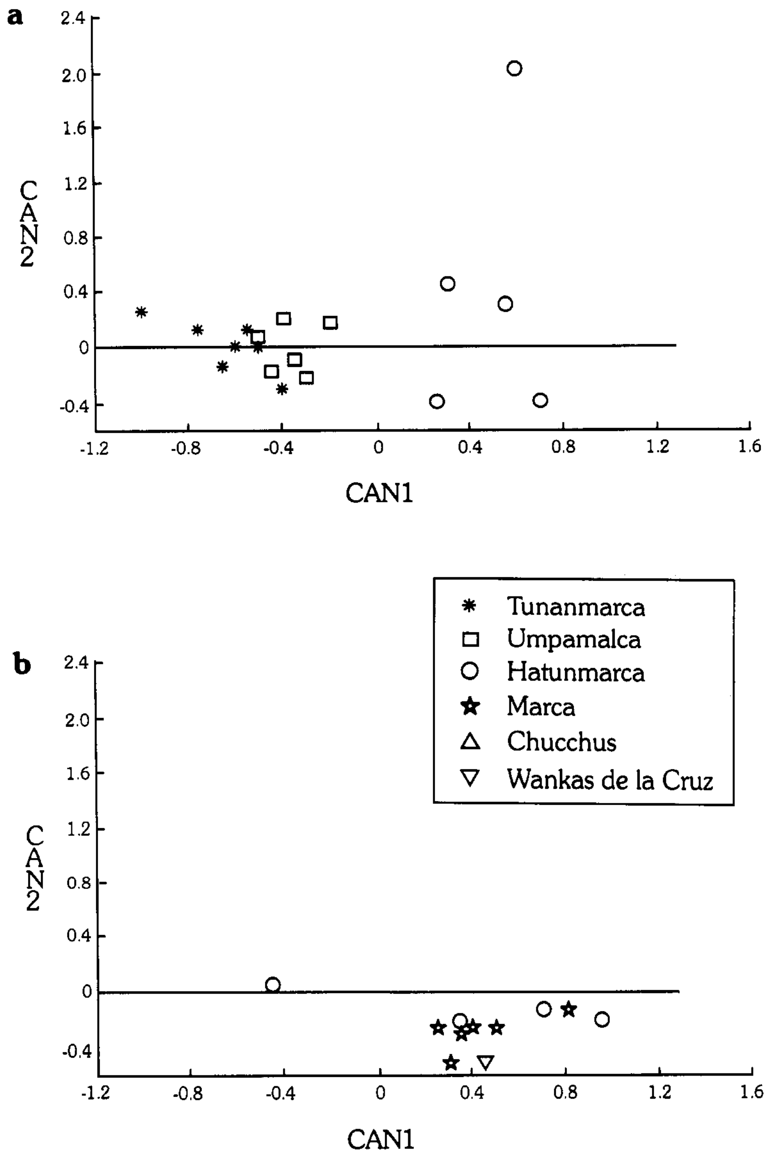

Figure 9.13. Plot ofscores on canonical variables from paste analysis of locally produced Base Clara, WankaRed, and Cream Slip vessels: (a) Wanka II, Differences in composition of materials indicate existence oftwo production sources for storage and serving vessels in Wanka II; (b) Wanka III. Relative homogeneity in the composition of materials indicates a single production source supplied all storage and serving vessels in Wanka III.

Intensity of Production

The relative amount of part- as opposed to full-time specialization is the most difficult parameter to identify archaeologically. I suggest that part- and full-time specialization can be distinguished by the identification of complementary economic activities within the household, agriculture, and production of other crafts. In the case of the Xauxa, all households with high waster indices also yielded evidence for a variety of productive activities, especially agriculture, but also including stone tool production and spinning (Earle *et al.,* 1987:Table 2). The level of skill manifested in these types also suggests that they were the products of part-time artisans, subject to periodic hiatuses during which their skills and motor coordination may have gotten rusty (Costin and Hagstrum, 1995; cf. Clark n.d.; Hagstrum, 1986). Thus, I conclude that ceramic production was a part-time activity for these potters.

Summary

The direct and indirect data for the production of Base Clara, Cream Slip, and Wanka Red consistently point to a form of independent specialization in which part-time, household- based producers were clustered within a limited number of communities and served a broader regional demand. This is a type of production I call community specialization (for a complete description of the various types of specialization, see Costin, 1986, n.d.). It is expected to occur under conditions similar to those encountered by the Xauxa: environmental diversity, population expansion, and agricultural intensification (Costin, 1986).

A number of lines of evidence indicate that production was more specialized in Wanka III than in Wanka II. First, the petrographic data indicate a decrease from two primary sources of pottery to one. Second, data from surface collections made at a large number of sites between 1977 and 1979 indicate some ceramic production at 57% of all Wanka II sites but only 21% of all Wanka III sites. Third, the difference in terms of waster indices between producing and consuming units is much greater in Wanka III than in Wanka II. Finally, while several Wanka II households had high waster indices clearly indicative of production and many had low scores indicative of consumption, the fairly large number of Wanka II households with moderate scores suggests that a sizable minority of the population made at least some of their pottery (Figure 9.10). In contrast, many fewer households in Wanka III had the moderate waster indices characteristic of production for use, suggesting that more households were procuring their pottery from specialists. This intensification may have been in direct response to Inka pressures on the local households to increase their productivity to meet state tribute demands.

Production: Micaceous Self-Slip Cooking Vessels

While I do not have comparable waster data for cooking ware, available indirect measures provide a wealth of evidence for the organization of production of this type. The first analysis was that of the raw materials used to produce the cookware. The relative homogeneity of Micaceous Self-slip is understandable in functional terms. Micaceous clays are particularly well suited to cooking: They transfer heat efficiently and are resistant to thermal shock fractures because of their low quartz content. The producers of Xauxa cooking vessels would have sought clays with these particular properties, and even separate production groups would have selected similar materials. Any differences among production groups will be subtle indeed.

The plots of scores on canonical variables used in the materials analyses illustrate clear differentiation among households by groups of sites. In Wanka II, Micaceous Self-Slip ceramics recovered from Tunanmarca and Umpamalca are distinct from those recovered from Hatunmarca (Figure 9.14a). In Wanka III, there is a single cluster in which all the sites

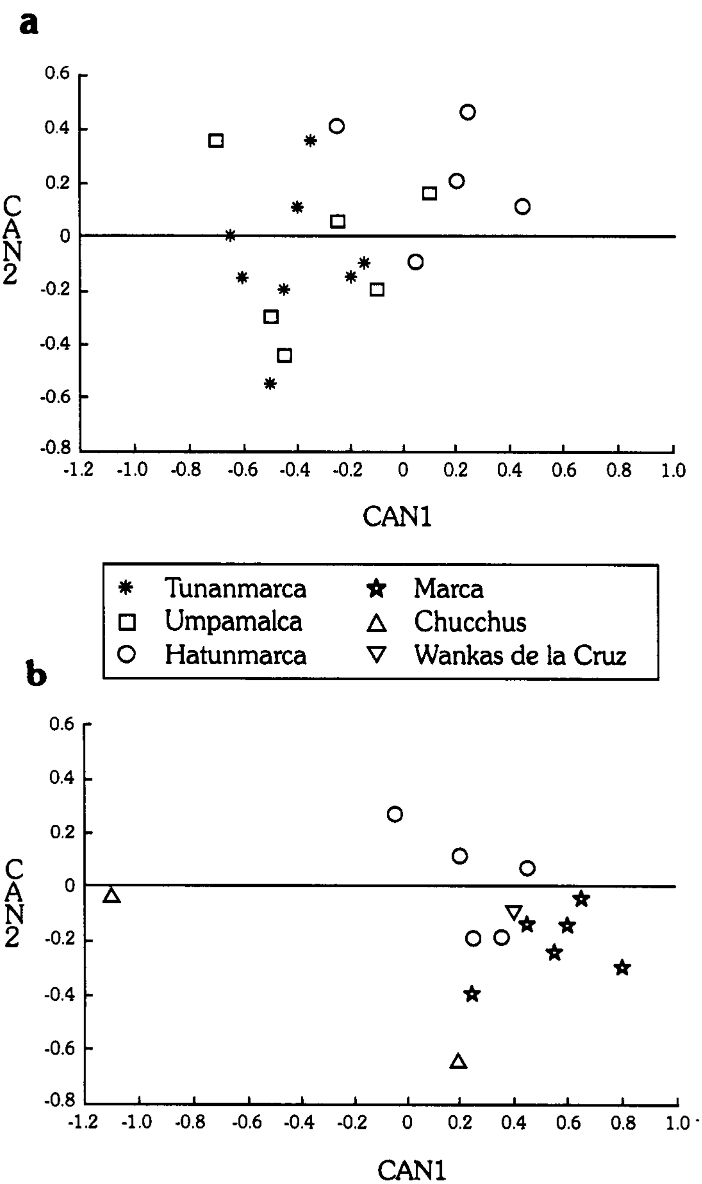

Figure 9.14. Plot of scores on canonical variables from paste analysis of Micaceous Self-slip: (a) Wanka II. Differences in composition of materials indicate existence of two production sources for cookware in Wanka II; (b) Wanka III. Relative homogeneity in composition of materials indicates a single production source supplied all cookware in Wanka III.

are members (Figure 9.14b). Interestingly, the Wanka III cluster is petrographically similar to the Hatunmarca Wanka II cluster (Costin, 1986:Figure 8.16). Thus, it appears that there were two production groups providing micaceous cookware in Wanka II, but only one in Wanka III. This is the same pattern recognized in the storage jar and serving bowl data, suggesting similar processes at work.

Recall that there is some evidence, in the form of a large ceramic dump, that Micaceous Self-slip was produced at Tunanmarca. It should also be noted that the only possible Micaceous Self-slip wasters recovered were found at Hatunmarca. This is admittedly scant evidence that the pottery was produced there. Nevertheless, it is tempting to suggest that Micaceous Self-slip, if produced at both Tunanmarca and Hatunmarca, was produced at the largest sites and, specifically, at political centers. This would indicate that the size of the demand, especially population density, was a key condition in determining the organization of production. Manufacture at the centers would give producers direct, proximate access to the bulk of the demand crowd. The fact that a single manufacturing site served multiple communities, however, indicates the type of production I call community specialization.

Other evidence helps complete the picture of the organization of production of cooking *ollas*. Micaceous Self-slip is a relatively low-labor-investment type (Table 9.3; cf. Costin, 1986; Costin and Hagstrum, 1995; Hagstrum, 1986, 1989). Although a certain proficiency is evident in their manufacture, these vessels do not exhibit high levels of skill (Figure 9.7; Table 9.2). Thus, it is reasonable to conclude that these ceramics were not the products of full-time and/or attached specialists. Rather, I conclude that the organization of cooking *olla* production was quite similar to that of the locally produced storage and serving types, and that Micaceous Self-slip was produced by part-time community specialists.

Some change occurred in the organization of Micaceous Self-slip production from Wanka II to Wanka III. I interpret the decrease from two primary sources in Wanka II to a single source after the Inka conquest as an increase in the degree of specialization. As with the other locally produced types, this change most likely is the result of indirect economic pressure to intensify production in the face of state tribute requirements.

Local Exchange Networks

Two small ceramic exchange systems were in operation within the Yanamarca during Wanka II. The first comprised the sites of Tunanmarca and Umpamalca. The distribution of wasters and the results of the petrographic analysis suggest that the potters of Umpamalca supplied local-style storage jars and serving bowls to the inhabitants of Tunanmarca as well as to other inhabitants of Umpamalca. The indirect evidence also indicates that Umpamalca and Tunanmarca shared a single source for Micaceous Self-slip cooking jars. Although the identification of Tunanmarca as a source for these cooking vessels is somewhat tenuous, such a situation would imply fairly vigorous exchange in pottery among the inhabitants of the two settlements.

The data indicate that the Wanka II inhabitants of Hatunmarca did not participate in the Tunanmarca–Umpamalca ceramic exchange network. Rather, it formed a second, local production exchange system. The moderate scores of almost all tools and by-products associated with ceramic manufacture indicate that Wanka II Hatunmarca was basically self-sufficient in terms of ceramic production. The petrographic data further indicate that

Hatunmarcawasnotsuppliedbythesamesourcesthatprovisioned Tunanmarcaand Umpamalca.

Wanka II, then, can be characterized by two separate local production–distribution networks. Both cookware and local-style storage jars and bowls were produced and exchanged within similar spheres. The boundaries of these economic units coincided with political divisions in the Yanamarca. The ceramic data indicate that the chiefdoms centered at Hatunmarca and Tunanmarca were economically independent of one another, with little or no exchange of utilitarian ceramics between them.

The relatively high concentrations of production debris at Marca in Wanka III indicate that this community was the primary source for local-style storage vessels and serving bowls. The indirect evidence indicates that the inhabitants of Wanka III Hatunmarca, Marca, Chucchus, and Huancas de la Cruz shared a single source for these types. The indirect evidence also indicates that in Wanka III, a single source supplied all sites studied with micaceous cookware. Thus, I conclude that there was a single ceramic production–exchange network in operation in Wanka III.

As in Wanka II, the Wanka III economic integration parallels the Wanka III political organization. Inka conquest resulted in the consolidation of the Xauxa into a single administrative unit. The most northerly production–distribution system (Tunanmarca–Umpamalca) broke down when the population was resettled into new communities. In Wanka III, all sites included within the study were integrated into a single, local exchange system.

DISCUSSION OF LOCAL PRODUCTION AND EXCHANGE NETWORKS

The data on local ceramic production and exchange suggest little qualitative change with the Inka conquest. Local, domestic utilitarian structures and networks were left basically undisturbed. The same forms were produced, and the same technology was used. Raw material sources in general continued to be exploited, although those closest to depopulated areas were abandoned, probably for pragmatic (transport) reasons, since similar-quality resources could be found closer to habitation and production loci. Most importantly, the fundamental organization of production survived into the Inka period. Although intensified, it continued to be organized along the lines of community specialization, a type of production particularly well-suited to a generalized peasant-subsistence economy. Similarly, distribution–exchangenetworks among the local Xauxa continued, although the consolidated population received its pottery from a single production source rather than the two that had served the previous Wanka II population. The local Xauxa population, with its primary production–distributionnetworks seemingly ignored by the Inka bureaucracy, maintained a degree of ceramic self-sufficiency similar to what it had enjoyed in the Wanka II period.

PRODUCTION AND EXCHANGE OF NON-LOCALLY PRODUCED CERAMIC TYPES

In contrast to the relative stability in the production and exchange of local utilitarian ceramics, the Inka conquest had a greater impact on the nonlocally produced types found in Xauxa households. Three categories of ceramics produced outside the local domestic economy circulated among the Xauxa. The first consisted of state (i.e., Inka-style) ceramics. The second category included the Andesite wares, which circulated regionally in fairly large quantities in both Wanka II and Wanka III. This type played a significant role in the indigenous Wanka symbolic system and political economy. The third category consisted of a wide range of types produced outside the Wanka region. These circulated in low frequencies in Wanka II and Wanka III, but their small numbers belie their significance for reconstructing Wanka social and political structures.

Inka[4]

Production. The most notable change in ceramic production after the Inka conquest was the establishment of a new production–distribution system for state-style ceramics. Petrographic differences between Inka vessels and the locally produced types suggest that the Inka aryballoids, bowls, plates, and *keros* were produced in a system kept apart from the one that supplied Xauxa-style pottery. As described by D'Altroy in Chapter 10, the Inka-style ceramics met a demand and filled a role distinct from that of the local utilitarian types; therefore, I predicted their production would be organized differently from local production. I expected that some form of attached specialization would be employed to provide a relatively homogeneous product, tied symbolically and economically to the ruling bureaucracy, whose distribution at least initially was carefully monitored by the state.

To place the production of Inka ceramics for use within the Yanamarca in its broader perspective, the analysis included a small number of Inka-style sherds from three Inka administrative centers in the Upper Mantaro area and two other Wanka sites outside the study area. The Inka sites were Tarmatambo to the north, Acostambo to the south, and Hatun Xauxa, the large Inka administrative center in the main Mantaro Valley. The Wanka sites were Patankoto, near Huancayo, and Ricran, to the north of the Yanamarca Valley (Figure 9.15).

The prediction of a limited number of sources for Inka pottery was upheld in the petrographic analysis (see also Instrumental Neutron Activation Analysis results in Chapter 10, this volume). For example, in the cluster analysis, over 93% of all the Inka sherds analyzed were classified into a single cluster, indicating that the bulk of the Inka sherds used by the Xauxa derived from a single production source. The largest minority group of Inka sherds was distinguished by having a paste similar to that used for the Andesite wares, believed to be manufactured south of the study area. The remaining outliers make up less than 1% of the assemblage. These outliers were recovered in all analyzed units, including Xauxa households and other sites. However, outliers were disproportionately represented at Tarmatambo, Acostambo, Ricran, and Patankoto. Canonical discriminant analysis was used to test the proposition that Inka ceramics used at these four sites were created at production centers different from that serving the Yanamarca. As Figure 9.16 illustrates,

[4] The analysis of Inka ceramics presented here was based on studies conducted largely independently of those reported by D'Altroy in Chapter 10, this volume (see also D'Altroy, 1992). The purpose of the present chapter is to consider the nature of production of the full range of ceramics found in Xauxa households, whereas that of the following chapter is to examine the specific characteristics of the Inka polychrome assemblage in households as a medium of controlled interaction between the state and its subjects. Because of the differing goals and analytical approaches, there are issues on which the analyses and interpretations converge and others in which the differing approaches yield complementary results.

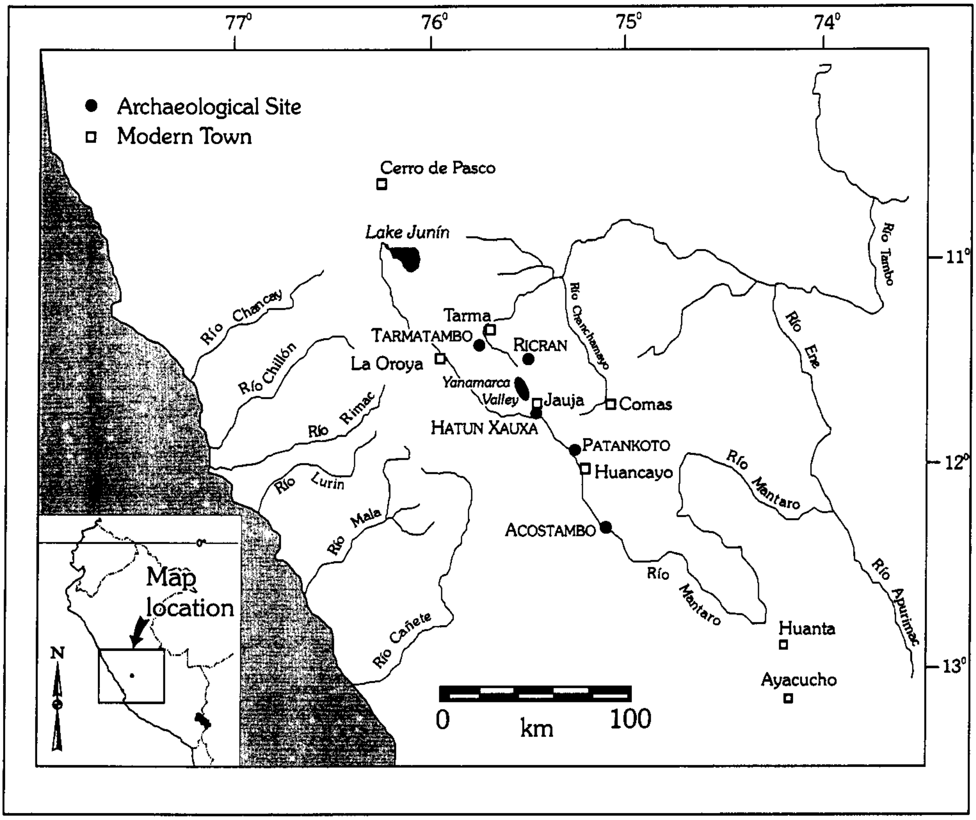

Figure 9.15. Map of greater Upper Mantaro region showing locations of sites used for supplementary collections included in analysis of Andesite and lnka wares.

it appears that Tarmatambo, Acostambo, Ricran, and Patankoto were served by different production groups than those supplying each other and the Yanamarca sites.[5]

Other data reflect on other parameters of the organization of Inka ceramic production. Because of their social and political significance, it was my supposition that lnka vessels were the products of attached specialists. Because no evidence for Inka ceramic production was recovered at local Wanka sites, I conclude that Inka ceramics were probably manufactured at state or special-purpose sites and are therefore the products of attached specialists. Furthermore, the Inka ceramics were the most labor intensive of the ceramics used by the Wanka, a characteristic of the products of attached specialists (Table 9.3).

[5]In a neutron activation analysis much more fine-grained than the petrographic work reported here, which included lnka sherds from many more sites in the Upper Mantaro, and lnka storage and administrative sites, D'Altroy and Bishop (1990) concluded that the region was served by two production groups.

I originally considered Inka pottery to be the product of either full-time retainers or part-time corvée recruited from among local potters (Costin, 1986; Costin and Hagstrum, 1995). I argued that these two types of specialists could be distinguished by the degree of standardization and skill embodied in the vessels. Interestingly, when analyzed objectively, the Inka vessels were not consistently more standardized than the local types. All types tested had similar levels of color diversity, indicating, in part, similar numbers of color formulators (Table 9.1). lnka rim diameters had a higher coefficient of variation than did Micaceous Self-slip jar rims, indicating a relatively larger number of Dotters producing the

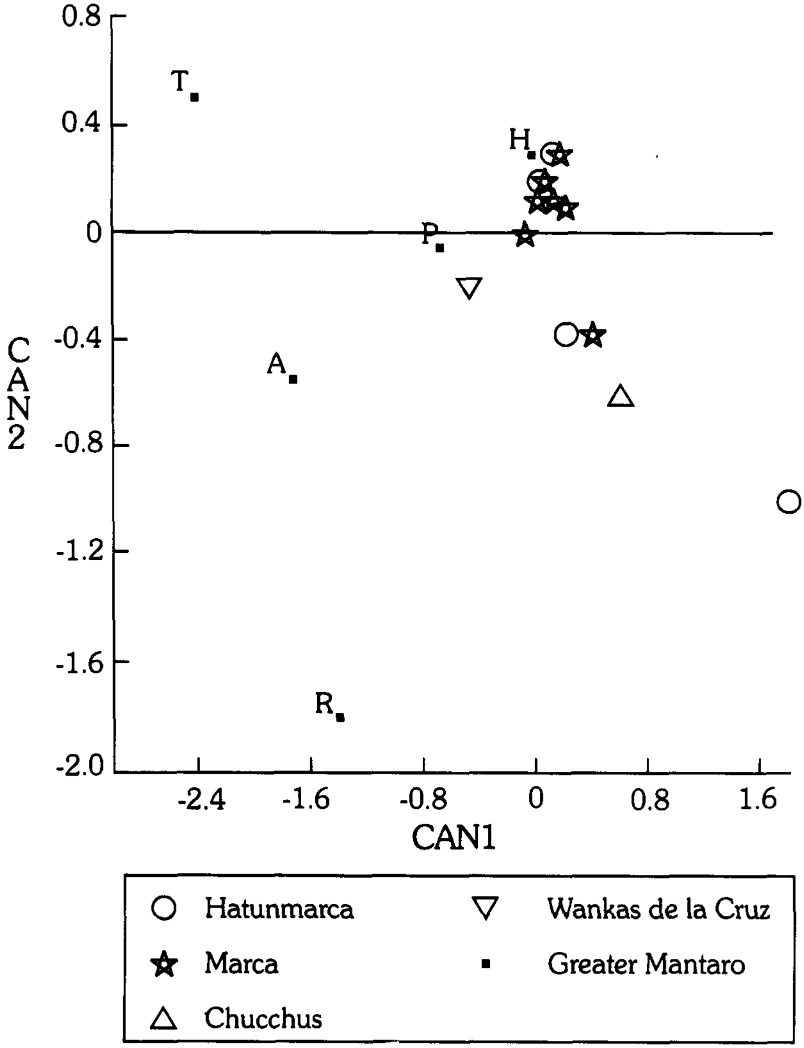

Figure 9.16. Plot of scores on canonical variables from paste analysis of lnka ceramics. Differences in composition ofmaterials recovered within and beyond Yanamarca Valley indicate existence ofseveral Inkaceramic production centers serving greater Upper Mantaro region. Sites outside the Yanamarca Valley are Acostambo (A), Hatun Xauxa (H), Patankoto (P), Ricran (R), and Tarmatambo (T).

assemblage, although the number of vessels analyzed was comparable (Table 9.2).[6] Finally, the Inka vessels exhibited only slightly more proficiency in their manufacture than did the other types (Figure 9.7). In summary, I did not identify the extreme differences expected if the organization of production of the local and Inka pottery was fundamentally different. Most importantly, the Inka assemblage does not manifest the high degree of standardization and skill expected of retainer workshops. I conclude that the organization of Inka ceramic production, although clearly attached, was in many ways similar to production for local consumption. The attached "counterpart" of community specialization is nucleated corvée, the type of specialization I infer for Inka ceramics. This is, in fact, the type of labor organization reported in several other locations, including Huanuco Pampa (LeVine, 1987) and among the Lupaca (Julien, 1982).

In summary, it appears that Inka ceramics were produced by part-time, probably corvée, laborers nucleated at the provincial level. Given the quantities of Inka pottery used and the limitations of the Andean transport technology, it would have been impractical to concentrate production further. The system I identify required that ceramics be transported primarily within valleys, which would be fairly easy to traverse. Further nucleation would have required transport through mountainous regions. Costs under such a system would be prohibitive—given the quantities consumed—even for the Inka. Thus, the production of Inka pottery was organized to maximize both control and efficiency. It was highly specialized to promote control. On a regional level, it was nucleated. A single production center—or at most a very few—served an administrative unit, usually the province. On an empirewide basis, however, production was dispersed enough to minimize the transport costs of large quantities of material over distances greater than 50 kilometers.

Exchange. The mechanism by which Inka ceramics were distributed to the local population is not clearly understood. Aryballoids and flaring-rim jars were associated with both storage (Morris, 1967; D'Altroy and Hastorf, 1984) and the brewing and serving of *chicha* beer (Loria, 1980; Morris and Thompson, 1985). If the Inka jars were distributed filled with *chicha,* then the exchange of these vessels was linked to state ceremonies. State-sponsored ceremonial feasting was a mechanism by which the state affirmed the legitimacy of its power and reaffirmed the "reciprocal" relationship between state and subject (Morris, 1982). If the Inka vessels represent participation in state-sponsored feasting events, then their presence in the household assemblage may be linked to the postconquest decline in local types associated with feasting: basins and bowls. The abrupt decline in the latter forms—which hit elite households especially hard—underscores Inka co-option of key social and political activities such as feasting in their attempt to wrest authority from the local elites and replace traditional ties of fealty to local leaders with loyalty to the state (Costin and Earle, 1989).

The distribution of Inka-style jars, if received full of staples, reflects the reallocation of subsistence products originally mobilized and stored by the state. Inka aryballoids replaced local-style storage vessels to some extent in Wanka III, particularly in elite households. I have interpreted the reduction in the number of storage jars from Wanka II to Wanka III as reflecting Inka economic and political policies (Costin and Earle, 1989). Stored food

[6] Melissa Hagstrum (personal communication, 1991) has suggested that the higher Inka coefficient of variation may reflect greater functional diversity among the Inka wares when compared with the single-function Micaceous Self-slip cooking *ollas.*

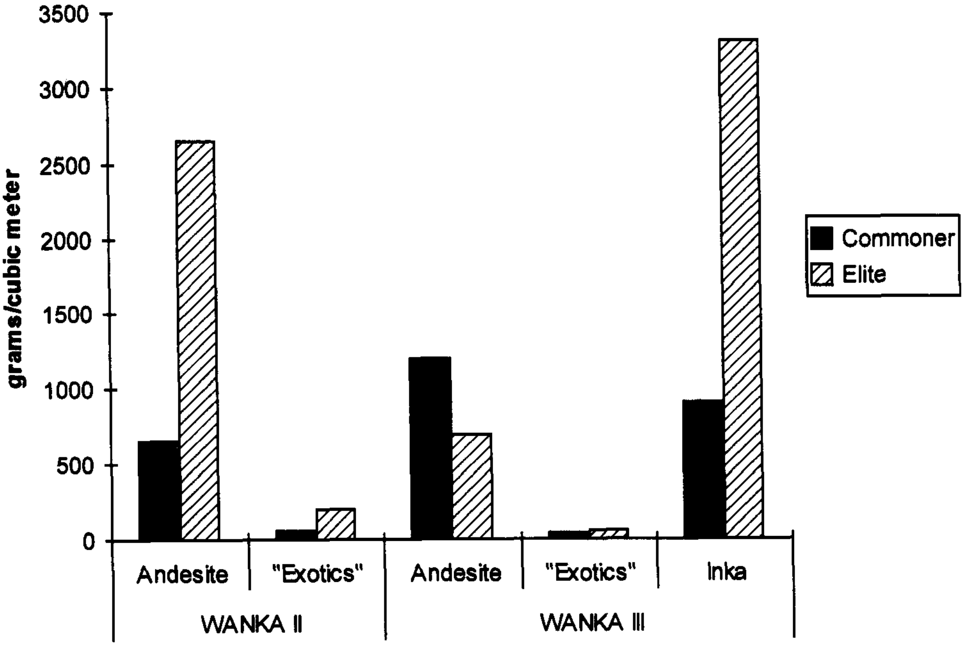

Figure 9.17. Bar chart illustrating the distribution of nonlocally produced ceramics by status and phase.

represented an important form of wealth in these agricultural societies. In Wanka II, elites used their control of stored resources—manifested in their greater ownership of storage vessels—to wield political and social power. These resources could be used to attract allies and followers, and to finance elite activities (Costin and Earle, 1989; Hastorf, 1991). In Wanka III, the Inka state co-opted not only the storage function but also, more importantly, the local elites' primary source of wealth and power. Without an independent source of revenue, local elites became dependent on the state for their social prerogatives and political authority.[7]

We do not know in what contexts further transfer of Inka pottery—among local Xauxa—took place. Commoners did have a fair amount of Inka vessels (see Chapter 10, this volume), I do not know if commoners obtained their pottery directly from the state or if local Wanka elites acted as intermediaries between the state and the commoner population. Historical documents indicate that elites distributed certain prestige items among their followers (Rostworowski de Diez Canseco, 1976, 1977; Ramirez, 1986).

Whatever the actual context of their distribution, the distribution of Inka style ceramics, especially aryballoids, reflects strategies for "lnka-nization" of status and authority in Wanka III (Costin and Earle, 1989). In Wanka III, elites and commoners have virtually the same amounts of Wanka-style decorated pottery (the locally produced decorated types and

[7]The concentration of storage jars in elite households in Wanka II illustrates how closely elite power was linked to the agrarian economic base. State co-option of the storage function is evident in the radical decrease in storage jars in Wanka III households (Costin, 1986: Costin and Earle, 1989) and the concurrent construction of large-scale, state-controlled storage facilities outside local communities (D'Altroy, 1981). This demonstrates how the state built upon established systems of finance, using control over them to transfer power from traditional local leaders to state institutions.

Andesite). The difference in the total amounts of labor-intensive pottery, a form of wealth, is in the distribution of Inka ceramics. Elites have more than three times as much Inka pottery as do commoners (Figure 9.17). Inka pottery was not simply an addition to the ceramic assemblage but replaced local Wanka types in the household—and particularly the elite—inventory. Yet elites could not acquire this status symbol independently; they had to rely on state largess. Thus, the distribution of Inka pottery reflects a partial elite withdrawal from local exchange networks—and potential (economic) alienation from their former commoner followers—and their dependence on the state for procurement of special pottery.

Andesite

Production. The statistical analyses indicated little mineralogical or petrographic variation among the Andesite wares. In the cluster analysis, over 99% of the Andesite sherds were placed within a single cluster. Because of the extremely broad distribution of this type, I also included in this analysis Andesite sherds collected from the sites of Tarmatambo, Ricran, Acostambo, and Patankoto to the south. These sherds were indistinguishable visually and petrographically from the Yanamarca sherds (Figure 9.18), indicating the same production source supplied Andesite pottery to the entire area known to use the type. I conclude that, in contrast with Micaceous Self-slip and the local types, all Xauxa households and sites in both time periods received their Andesite wares from the same production group.

There was little change in the organization of Andesite production after the Inka conquest. The petrographic analysis indicates the same source continued to distribute Andesite wares over a wide region. The technological attributes of these wares also indicate no change in the organization of Andesite production.

Exchange. It is generally accepted that the Andesite wares were produced in the southern part of the Mantaro Valley, perhaps at the site of Patankoto, near Huancayo. The Andesite wares were distributed broadly, as far north as Tarma, west to La Oroya (Hastings, 1985), and south nearly to Huanta (Lavallée, 1967). This represents a radius of nearly 100 kilometers from the probable source of manufacture. The economic ties represented by the distribution of Andesite wares cut across political boundaries. This is in sharp contrast with Micaceous Self-slip and the Xauxa-style storage and serving vessels produced locally, where political and economic boundaries were basically unified.

In Wanka II, elites had significantly more Andesite pottery than did commoners (Figure 9.17), which indicates greater elite participation in the regional exchange networks. These large, elaborately decorated storage jars were most certainly important in display behavior as symbols of elite power and authority. As part of an extensive exchange network, the Andesite wares also are likely to have represented political and economic alliances among neighboring elites.

There is a 36% overall decline in the consumption of Andesite wares from Wanka II to Wanka III (Figure 9.19). This represents a breakdown in the formation of horizontal ties among neighboring elites in favor of vertical ties between local elites and their Inka conquerors. This interpretation is supported by an equalization between statuses in the distribution of Andesite wares (Figure 9.17). In Wanka III, elite power was derived from direct ties with the Inka state and symbolized by Inka-style commodities. The Xauxa elites deemphasized alliances with other ethnic elites in favor ofties to the state. Commoners may have capitalized on the fall in elite demand and the imposition of the Inka peace to obtain the Andesite prestige ware for their own use.

LONG-DISTANCE EXCHANGE

Very few of the "nonlocal" sherds recovered in the UMARP excavations represent types widely described in the archaeological literature for Peru. Some are from the neighboring areas of Tarma and San Blas. Most others are probably ceramics from less well-known

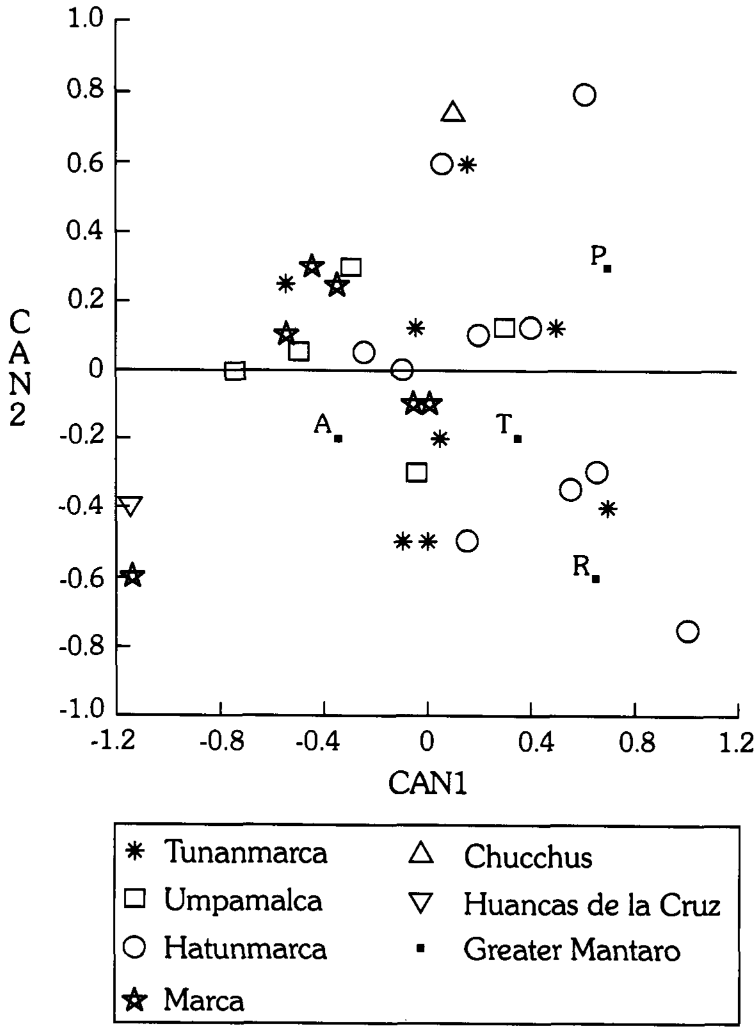

Figure 9.18. Plot of scores on canonical variables from paste analysis of Andesite ceramics. Homogeneity in composition of materials recovered throughout greater Upper Mantaro indicates that a single production source supplied Andesite ceramics. Sites outside the Yanamarca Valley are Acostambo (A), Patankoto (P), Ricran (R), and Tarmatambo (T).

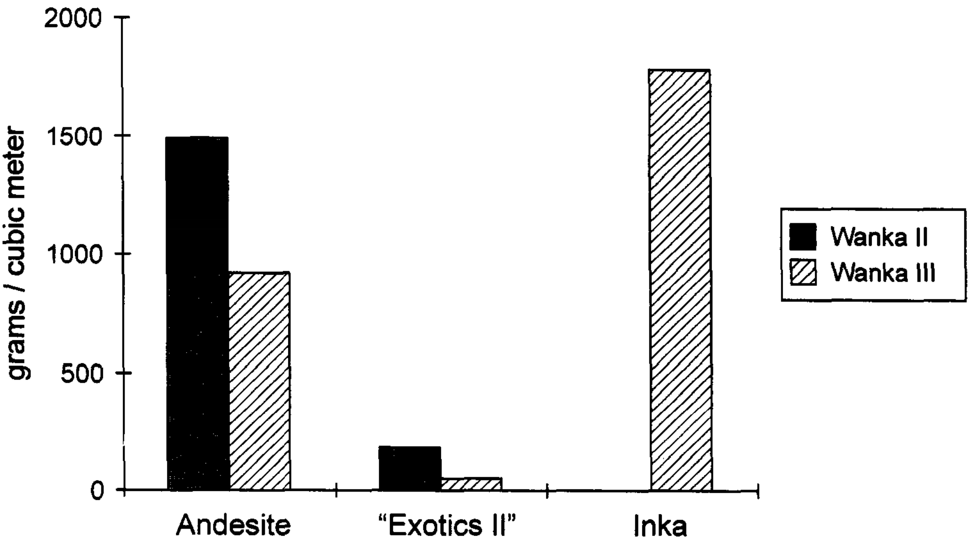

Figure 9.19. Bar chart illustrating the distribution of nonlocally produced ceramics by phase.

highland chiefdoms located in the central Andes, not too far from the Mantaro. It is amazing that among the imports recovered from Wanka III contexts were several small sherds clearly assignable to the Chimu style, indicating some exchange between the North Coast and the Central Highlands in the Late Horizon. The counts of these types were too low to be used in an analysis of the organization of their production, which was also a topic not relevant in this research. However, the distribution of these wares reflects strongly on changes in political and social networks after the Inka conquest (Costin, 1986, 1988; Costin and Earle, 1989).

Counts of exotics were quite low in all contexts. In both periods, the frequency of nonlocal types was higher in elite households than in commoner patio groups (Figure 9.17). This indicates significantly greater elite participation in extraregional networks in both periods. However, the abundance of exotics fell 74% from Wanka II to Wanka III (Fig. 9.19). As with the decrease in Andesite wares, the decrease of other imported types in Wanka III indicates a shift in alliance building from horizontal ties between neighboring elites to vertical ties between local elites and the Inka state.

SUMMARY AND CONCLUSIONS

The ceramic "economy" represents not only a microcosm of the Xauxa domestic economy but also the ties between the economy and sociopolitical process. It illustrates that much of what the Xauxa population used was produced by local specialists for circulation within a limited exchange sphere. The lack of qualitative change in the organization of production after the Inka conquest illustrates the relatively "hands-off' approach the Inka took to those parts of the local economies from which the empire derived no direct benefit. Pottery continued to be manufactured in much the same way it had before the conquest. There was no change in technology (Costin *et al.,* 1989)—possibly not even in the raw materials used—and no qualitative change in the organization of local production. The increase in the degree of specialization—noted primarily as a reduction in the number of production groups serving the population—reflects in part the consolidation of the Xauxa population in the southern part of the Yanamarca and in part an intensification made necessary by increased demands on Xauxa labor to meet state tribute demands.

The data indicate that several different types of specialization operated to supply Xauxa households with needed utilitarian and special-purpose ceramic types. Basic household needs for storage jars, serving vessels, and cooking *ollas* were met with a strategy I call "community specialization". Here, household-based potters were concentrated in a limited number of communities and distributed their wares on a local basis. Such strategies are most often found among peasant populations struggling to survive under conditions of population growth, intensification, and unequal access to basic resources—all conditions that pertain to the Wanka.

It is important to note that whereas elites used more of all the locally produced types, especially in Wanka II, they did not establish a special production system to fill that demand. Rather, a single network supplied these vessel to all segments of the social spectrum, although elites acquired more of them. It appears that in Wanka II, the level of sociopolitical complexity and degree of concentration of wealth could not support recognizable attached specialists. In Wanka III, a wealthier and more powerful stratum—consisting of individuals tied in to the Inka bureaucracy—was superimposed on Xauxa society, but these people seem not to have been interested in the production of local decorated types; thus, local production was little affected by increased social stratification.

In Wanka III, production became more nucleated and hence more specialized. I interpret this as a direct response to the new economic obligations imposed by Inka institutions on the Xauxa populace. Although the state did not dictate the form of production for local consumption, the local population adopted a more intensive and efficient production system in order to maintain its own levels of consumption while increasing production to meet state demands. No qualitative change in the organization of production was required, but production did become more concentrated in the hands of fewer, presumably more efficient, producers. The increasing nucleation also fits with the Inka pattern of encouraging communities to focus more efficiently on a narrower range of economic activities (Earle, Costin, and Russell, 1986).

Although the Inka did not meddle directly in the production of ceramics for local consumption, they did establish a new production system to procure politically and socially symbolic vessels of the Inka style. Here, key concerns were control of quality and distribution. To meet these objectives, potters worked directly for the state under supervised conditions, in which they were probably allocated raw materials from a central store and given general instructions regarding vessel shape and design. Interestingly, potters were not so carefully controlled or supervised that they created highly standardized vessels. Although the vessels give the impression of being highly standardized, in fact, this homogeneity is superficial.

The exchange data indicate that—in terms of ceramics—the Xauxa polities were in large part economically self-sufficient. In Wanka II, each chiefdom produced over 95% of the ceramics used by its members. There was vigorous exchange among politically allied communities but apparently little documented ceramic exchange between the competing chiefdoms. All utilitarian types circulated within these local exchange systems. The pattern is similar in Wanka III. Again, the entire local study area was basically pottery self-sufficient. Excluding Inka ceramics—supplied by the state—local potters produced over 95% ofthe ceramics used in Wanka III domestic activities. The Inka conquest did not disrupt the existing pattern, although the resettlement of much of the northern Xauxa population clearly affected the location of specific nodes in the network.

In contrast with the local exchange system, the goods that made up the regional and long-distance ceramic exchange networks were luxury or prestige wares. In Wanka II, these consisted primarily of Andesite wares brought in from the south. The ceramic products of this area circulated through much of the Central Highlands, crossing political and social boundaries in small but consistent amounts. This production–distribution system was able to survive the Inka conquest intact. It continued to operate in the Late Horizon, although the conquest indirectly changed the nature of the demand for these vessels.

The Xauxa population did not, or could not, capitalize on the imposed peace to increase their access to nonlocally produced commodities. I suggest two reasons why this would be the case. The first involves the relationship between pacification and integration of local economies. The Inka did bring peace to the region, which might be expected to foster more extensive trade networks. However, to prevent rebellion, they discouraged economic networks and political alliances between neighboring groups, instead encouraging local self-sufficiency.

The second reason the Xauxa did not expand their exchange networks involves the nature of indirect rule and its effects on elite wealth. Although the state ruled through local elites, the Inka effectively undermined the independent power base of the local leaders, forcing them to rely on the state for both their economic needs and symbolic legitimization (Costin and Earle, 1989). In Wanka II, elites were distinguished from commoners by their higher consumption of fancy items, including imported ceramics. In Wanka III, elites continued to have more luxury goods, but only more Inka-style fancy items, which they received from the state. The shift from locally defined prestige goods in Wanka II to Inka-style pottery as the symbol of power and authority in Wanka III, illustrated by the replacement of locally and regionally produced decorated pottery with Inka vessels, especially in elite households, underscores Inka strategies for undermining local authority and vesting prestige in state-defined and distributed symbols.

In summary, the changes evident in the production, exchange, and distribution of ceramics among the Xauxa illustrate the selective nature of the effects of the Inka conquest on the Xauxa household unit and the Xauxa domestic and political economies. Local utilitarian ceramic production and exchange, rooted firmly within the domestic economy, survived incorporation into the empire with little qualitative change. In contrast, ceramics that served multiple functions within the political as well as domestic economies—Inka ceramics, Andesite wares, and the small quantities of goods sourced beyond the Upper Mantaro—were affected by Inka strategies for pacifying, administering, and financing their empire.

Acknowledgments. I would like to thank all the members of UMARP who helped collect and process the data reported in this chapter. Tim Earle read an earlier version ofthe chapter and made many useful suggestions.

Chapter 10

State Goods in the Domestic Economy: The Inka Ceramic Assemblage

Terence N. D'Altroy

Cuzco-style ceramics, together with the state architecture along the road system, are the archaeological hallmarks of Inka presence throughout the Andes. The distinctive polychrome pottery was present in perhaps two thousand state installations and myriad local sites from Ecuador to Argentina. Nonetheless, its role in the state economy was narrower than its archaeological prevalence might lead us to surmise. The uses of state vessels probably centered on the ceremonial hospitality that lubricated political relationships, as pots were used to brew beer, to prepare food, and to serve and store both food and drink. They were also used to contain offerings of food and to accompany burials as grave goods (Morris, 1995:523). More broadly, Inka pottery's use in political activities, especially at provincial centers, emphasized the importance of the state as symbolic and physical sponsor. In a polyglot empire such as Tawantinsuyu, visual displays were a key form of demonstrating state presence and affiliation (DeMarrais, Castillo, and Earle, 1996). The finer Inka ceramics usually stood out as the most elegant vessels in use, reinforcing the state's position of dominance through material culture. Their presence was often an unmistakable emblem of imperial dominion, although caches of vessels were sometimes used to assert claims of authority at the extremes of imperial advances where Inka rule had slight practical effect (e.g., McEwan and van de Guchte, 1992). Conversely, there is little evidence that Inka pottery was used in the everyday affairs of the subject populace in most of the empire.

In this chapter, I would like to examine the Cuzco-style assemblage in the Upper Mantaro Valley as a material component of state–subject relationships. Inka vessels were present in large numbers at local towns, providing evidence of political relations, activities conducted for the state at subject communities, and the intrusion of Inka rule into the smallest domestic units of native society. In keeping with this volume's focus on the domestic economy, my discussion here centers on patterning in the ceramic data from household contexts. I am most concerned with the functional composition of the household assemblages from the two towns, Hatunmarca (J2) and Marca (J54), that occupied elevated positions in the region's sociopolitical hierarchy and whose remains may each contain 1–2 million Provincial Inka sherds. During the 1982–1983 fieldwork, UMARP's excavations recovered about 9,000 sherds of this style from Hatunmarca and 11,000 from Marca.[1] Along with an additional 1,000 Inka sherds surface collected from those two sites, almost 6,000 from the provincial center of Hatun Xauxa and about 1,000 from other sites, the project's analytical collection of Cuzco-style polychrome pottery comprises about 28,000 sherds. As we will see, however, the collection is distressingly small for many questions of interest, when taking into account the nature and number of recovery contexts.

Given the limited contexts of use, it is important not to overemphasize the importance of Inka pottery in Xauxa households as a measure of interaction between the state and subject populace. Nonetheless, the variations on standardized patterns found in the excavated households exemplify important features of state–subject relations. Of special interest here are the correspondences between Hatun Xauxa and subject communities with respect to ceramic diversity, function, and sources of provisioning. The discussion will not venture into many of the relationships between the ceramic assemblage and the rest of the material record, however, since those issues will be largely reserved for the final chapter, where I will examine how the distribution of Inka vessels in subject households fits into the larger picture (see also Costin, Chapter 9, this volume). Similarly, a stylistic analysis will be reserved for another time.

CERAMICS IN THE STATE ECONOMY

Inka polychrome ceramics are found in abundance in the Cuzco area (e.g., Valcárcel, 1934–1935; Rowe, 1944) and in provincial centers along the main highland roads, including Tumipampa, Ingapirca, Huánuco Pampa, Pumpu, Hatun Xauxa, and Hatunqolla (e.g., Meyers, 1976; Alcina Franch, 1978; Julien, 1983, 1993; Morris and Thompson, 1985:71–80; D'Altroy, 1981, 1992). On the Peruvian coast, their distribution was far more limited, even at major sites such as Tambo Colorado and Inkawasi (Hyslop, 1985; Morris, 1995; Hayashida, 1995). From central Bolivia south, fine Cuzco-style pottery was often a small component of the ceramic assemblage of state installations, where it was frequently concentrated in burials (e.g., Ambrosetti, 1907–1908; Hyslop, 1984). At locations where Inka ceramics formed a small fraction of the assemblage, the vessels were supplanted by pots made in local styles and those of resettled colonists (e.g., Lorandi, 1984; Williams and Lorandi, 1986; Calderari and Williams, 1991). The lack of spatial fit between the distributions of pottery and architecture should not be surprising, since, as Hyslop (1993:339) and Morris (1995) point out, they served different purposes.

The prevalence of Inka pottery in the Upper Mantaro Valley, coupled with intensive investment in construction of state facilities, is accordingly part of a Peruvian highland pattern that was not replicated equivalently throughout the empire. Even within the sierra, the ubiquity of Inka ceramics seen at Mantaro towns was unusual. Some parallels may be found, such as at the Chupaychu village of Ichu, where fragments of large vessels were recovered from the residence of a local dignitary (Morris and Thompson, 1985:138–143).

[1] The analyses of the immense numbers of sherds recovered during the 1982–1983 excavations and the creation of the UMARP master ceramic catalog were undertaken by Cathy Costin, Melissa Hagstrum, and Lisa LeCount. I am eternally grateful for the enormous amount of work that they put into this tedious job. The author of this chapter took the measurements of the ceramics discussed here and conducted the statistical analyses.

Hundreds of Late Horizon settlements also contain a small proportion of Inka ceramics in their assemblages (e.g., Lavallée and Julien, 1983; Hyslop, 1993). Nonetheless, both the quantities and contexts of recovery of Inka pottery in most instances were generally more limited than in the major towns of the Mantaro.

Cuzco-style Inka vessels come in an array of forms, among them flared-rim jars with constricted necks, open-mouth jars, open and closed bowls, plates with duck head and tail appendages, drinking cups *(keros),* bottles, and pedestal-based cooking pots (see Valcárcel, 1934–1935; Rowe, 1944:47–49, Figures 18–19; Rowe, 1946:243–44; Hyslop, 1993:340; Costin, Figure 9.5, this volume). The collection from Chinchero, a royal estate near Cuzco, has yielded 28 distinct shapes of pots (Rivera, 1976:29), illustrated in Figure 10.1. Hyslop (1993:339) observes that the full set of Cuzco forms was apparently not reproduced anywhere else, perhaps because of the wider range of activities and higher social status found in the heartland.

Inka pottery is often distinguished by its high technical quality. It is generally well tired and burnished, contains low proportions of temper, and is decorated with lustrous, opaque slips. Motifs most commonly consist of geometric forms, such as solid bands, rows of diamonds or pendant triangles, concentric diamonds, large expanses of solid color or highly polished buff areas, the "fern motif' on flared-rim jars, and hatching. The decorated areas are typically well delineated and consistently placed in the same parts of given vessel forms. For example, the distinctive flared-rim jars, often called aryballoid jars or *aríbalos,* were often decorated on one side with geometric motifs and the other was finished in a solid color. Similarly, the rims of plates, bowls, and jars were customarily finished with a solid band of red or black slip. The result was a labor-intensive, visually distinctive ware of high quality.

Cuzco-style polychrome pottery is noteworthy for its regularity, even considering the standardization for which Inka culture is renowned. Apart from rendering the pottery instantly recognizable, the repetitiveness of form and decoration aided duplication by potters working for the Inka. Even so, regional variants in style and quality are readily distinguishable. The Inka pottery from the Upper Mantaro, for instance, differs in nuances of shape, color, and motif selection from that of Quito, Tarma, Pumpu, Huánuco, or Hatunqolla, all of which differ from Cuzco polychrome proper (Morris, 1972; Meyers, 1976; Julien, 1983, 1993; Morris and Thompson, 1985; D'Altroy, 1992). The variations in regional styles, and potters' tendencies to combine elements of Inka pottery with regional styles, led to a plethora of Inka-related ceramic types throughout the Andes.

When viewed in terms of the labor and resources invested in manufacture, Inka pottery was a minor component of the state economy. Although a great deal of labor was allotted to making pots for the Inkas, ceramists formed only a tiny fraction of the workers who rendered labor service. Pot-making was only one of about 40 kinds of duties that the chroniclers named in their general lists (Chapter 4, this volume). In the best-documented case, the Huánuco *visita* of 1549, Chupaychu potters reportedly made up 1% of the labor force owed the Inkas, even though enormous quantities of pots were consumed at Huánuco Pampa, an eminent provincial center (Morris and Thompson, 1985). This proportion, equal to that of dye makers, sandal makers, and woodworkers, was only one-tenth that of tapestry weavers (Helmer, 1955–1956).

Spanish inspections and court documents suggest that Inka pottery was made in two and maybe three contexts (D'Altroy, Lorandi, and Williams, 1998; Hayashida, 1995). The most

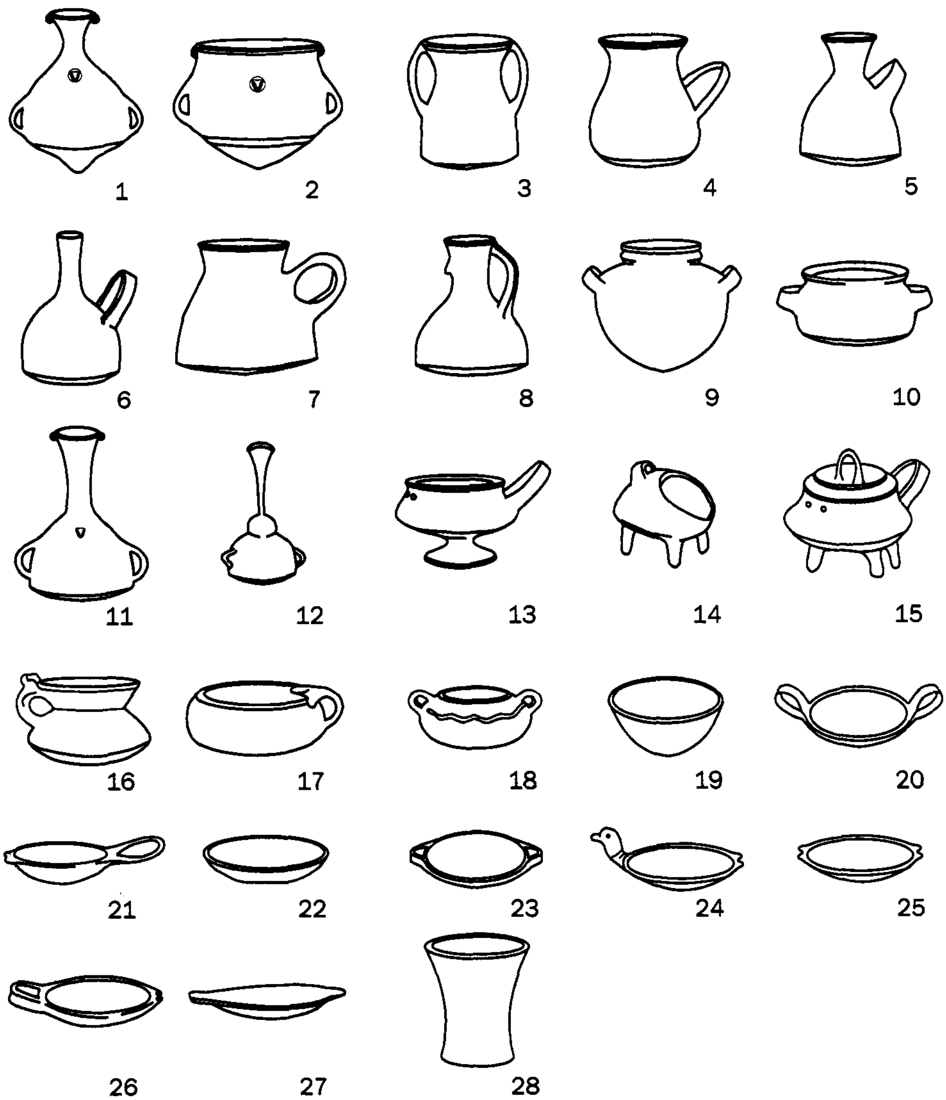

Figure 10.1. Major Inka vessel forms (after Rivera, 1976); those recognized in UMARP's excavations include 1, 2, 6, 10, 13, 20, 22, and 28.

celebrated were enclaves of specialists, who formed part of the network of resettled colonists called *mitmaqkuna.* Espinoza Soriano (1973) cites unpublished sources, for example, that state that the Inkas settled potters from fourteen different ethnic groups in Cajamarca to work for them. Similarly, the Inkas installed either 100 or 300 potters at Milliraya to make pottery alongside 1,000 tapestry weavers (Murra, 1978; Spurling, 1992). Many facilities may have been created fairly late, as witnesses often attributed them to the reign of Wayna Qhapaq, who died in 1528, after ruling for more than three decades.

A second option was for the state to control the raw materials, providing them to the potters and compelling the manufacture of a certain number of vessels of a given kind. This kind of production among existing potting communities may have been a more specialized analog to the provisioning of wool from state herds to subject households, where the women habitually spun thread for the Inka (Murra, 1962). Such a situation may have existed in the Huánuco region, where indigenous Chupaychu potters said that they made vessels for the state in their home villages and then transported the products to Huánuco Pampa and elsewhere. LeVine's (1987; see also C. Julien, 1982, 1988, 1993) analysis of production in the area suggests that artisanry often took place where the raw materials for particular goods were found naturally.

A third option, in which the state received ceramics directly, is considered to be unlikely by many scholars for any Inka activity, not least because of the repeated testimony that subjects owed only labor, not goods (see Murra, 1980). Nonetheless, it is hard to envision a means of creating the assemblages found at Inka sites in the southern Andes—which consist overwhelmingly of pots in local styles—without considering the possibility that potters turned over finished products directly. One reference suggestive of this activity is present in an inspection in the Guancayo region of Peru's upper Chillónvalley, where elites reported supplying quotas of pots (Martinez Rengifo, 1963). It is possible that direct requisitioning was limited to areas ofearly, spatially peripheral, or administratively marginal imperial occupations. However, the majority ofthe assemblage recovered from the imperial provincial center of Pumpu, midway between Hatun Xauxa and Huánuco Pampa, consisted of local types (Matos Mendieta, 1994). Clearly, the issue deserves further exploration.

The documents say little about how Inka vessels found their ways into subject households (Hyslop, 1993). Some witnesses reported that the Inkas included pottery, especially tumblers, among the gifts presented to subject elites when they capitulated to Inka rule or reinforced existing ties (Toledo, 1940c: 19–20). Murra (1975, 1980) has also drawn attention to the Inkas' practice of providing state workers with the supplies they needed while carrying out state activities. Generally speaking, we may surmise that the pottery was distributed through a state-defined hierarchy, but a more refined discussion of distribution practices is not yet possible.

THE UPPER MANTARO INKA ASSEMBLAGE

Under these conditions, the prevalence of Inka pottery at local towns in the Mantaro may be seen as evidence for robust ties between the Inkas and the Xauxa. There is certainly documentation for such a linkage. Chroniclers invariably listed Hatun Xauxa as a major Inka center (e.g., Vaca de Castro Cavellero, 1908:442–446;Cobo, 1979: Bk. II, Ch. 32, p. 228), and Sarmiento de Gama (1960:Ch. 52, p. 257) reported that a governor ruled the northern half ofthe empire from there under Thupa Inka Yupanki's dominion. The valley's people also enjoyed a favored position under both Wayna Qhapaq and Waskhar (Cobo, 1979:Bk. 2, Ch. 16, p. 153), to the extent that Wanka Awki, the son of Wayna Qhapaq and a Xauxa woman, led Waskhar's armies throughout the inglorious early campaigns of the last dynastic war. Substantial amounts of state pottery at local settlements are therefore not entirely unexpected, but the composition and uses of the Inka assemblage in subject communities merit some attention.

General Description

I distinguish the following classes of Inka-era pottery in this work: (1) *Cuzco Inka,* which were vessels likely imported from the capital; (2) *Provincial* or *Xauxa Inka,* which were pots in the Cuzco style but likely provincially made for the state; (3) *Local Inka,* which were poor imitations of Cuzco Inka pottery; (4) *Wanka Inka,* which combined stylistic and morphological characteristics of the Cuzco and indigenous Upper Mantaro styles; and (5) a series of indigenous Upper Mantaro types, among them *Base Roja, Base Clara,* and *Wanka Reds* (see Costin, Chapter 9, this volume). Ceramics were classified primarily according to their stylistic motifs, surface finish, and morphology (D'Altroy, 1981), and secondarily by their pastes and chemical compositions (D'Altroy and Bishop, 1990; cf. Costin, 1986, Chapter 9, this volume). We have identified ten Provincial Inka ceramic forms in the valley: flared-rim jars, other jars, open bowls, closed bowls, plates, ollas, pot lids, bottles, tumblers, and miniatures (including jars and bowls) (Figure 10.1). This set of forms is likely a compression of a wider variety of Inka forms, but our reliance on sherds, rather than complete vessels, precluded a finer classification.

The Mantaro Provincial Inka pottery is for the most part a finely crafted ware. Two features are especially pertinent for this analysis: intensity of production and standardization. As described by Costin (1986; Chapter 9, this volume) and Hagstrum (1989), Inka pottery is the most labor-intensive ware made in the region prehistorically. Both production-step and time-investment measures show that the polychrome vessels required more effort than any other ceramic type. Coupled with the apparent scale of production, the intensity suggests that a great deal of labor was committed to making this durable good. The standardization of the pottery, however, suggests that economies of scale may have ameliorated the labor investment.

The decorative elements on these ceramics were fairly limited. The most common form, the flared-rim jar, exhibited only thirteen basic motifs in the collection from Hatun Xauxa. In descending order of frequency, these were pendent ferns, bands, diamonds, pendent triangles, bars and crossed lines, bars and diagonal lines, concentric diamonds, circles, dots, zigzags, squiggles, checkerboard, and orthogonal lines. The five basic motifs found on bowls and plates were concentric diamonds, bars and crossed lines, circles, squiggles, and bands. Six slip colors were distinguished: red, black, white, purple, brown, and orange.[2] State ceramics with solid slips, well-executed decoration, or both, were invariably highly polished. This feature contrasts markedly with all local styles save Base Roja, which can be distinguished easily on the basis of its paste, design, and decoration (Costin, Chapter 9, this volume). The sole exception to the high-quality decoration among Inka vessels may be found in micaceous cooking pots, which can be distinguished by their pedestal bases and angled strap handles.

[2] Munsell soil color ranges: (1) red: 10R 3/6, 10R 3/8, 10R 4/4, 10R, 4/6; (2) black: 5YR 3/1, 5YR 3/2, 10R 2.5/1, 10R 3/1, 10R 3/2; (3) white: about 7.5 YR 8/2, 10YR 8/4; (4) purple: 10$3/1, 10R 3/3, 10R 4/3; (5) brown: 2.5YR 316, 5YR 4/3, 5YR 5/3; and (6) orange: 2.5YR 416, 2.5YR 4/8, 2.5YR 5/6, 2.5YR 5/8.

Sources of Production

Regrettably, we can not yet identify where Inka ceramics were made in the Upper Mantaro, but it seems reasonable to infer that the pots were made somewhere in the region. Supporting evidence comes from compositional study of a sample of Late Horizon pottery (D'Altroy and Bishop, 1990). This study showed that the Upper Mantaro Inka-style pottery was different in chemical composition than comparison samples from Cuzco and Lake Titicaca but similar to the Inka pottery from Tarma, just to the north. The only compositional overlaps from different regions were two plates, one each from Marca and Hatun Xauxa, that may have been imported from Cuzco. These plates were visually different from the Upper Mantaro pottery in paste and slip color. The compositional data also indicated that two production sources supplied most of the Inka-style pottery in the region; both were relatively homogeneous and distinct from local styles. One source apparently supplied most pottery to Marca, Hatun Xauxa, and a road station (J45) about 20 km to the north. The other source was the principal supplier for Hatunmarca and the neighboring lakeshore site of Tragadero (D'Altroy and Bishop, 1990: Figure 4). Most of the ceramics that did not belong to either of the two main source groups were recovered from Hatun Xauxa, whose residents might be expected to have had access to a wider network of state goods than the native elites.

The compositional data suggest that state personnel controlled the manufacture of ceramics in the Cuzco polychrome style, probably in part by appropriating the source of raw materials that could be used. We cannot, however, determine if the state tapped local ceramists or some of the region's colonists, among whom were settlers from Yauyos, Huamachuco, Cuzco, Collaguas, Cañare, and Chachapoyas. Either choice seems tenable, although UMARP's fieldwork has not yielded concentrations of ceramics in nonlocal styles that elsewhere are markers of *mitmaq* potters (Lorandi, 1984; Williams, 1996).

DISTRIBUTIONS OF INKA POTTERY AT LOCAL TOWNS

One of the striking features of the archaeological record in the Upper Mantaro, as noted earlier, is the prevalence of Inka polychrome pottery. At least 125 sites, only 6 of which are clearly state installations, have yielded at least one fragment of this pottery in surface studies and excavations. Although surface collections at 98 sites recovered more than two Inka sherds, most Inka pottery outside the provincial capital may be found at Hatunmarca and Marca, the region's two largest towns in the Late Horizon. The frequencies of all ceramics from Inka-era occupations excavated at those towns are summarized in Tables 10.1 and 10.2. These tables exhibit the total numbers of sherds recovered from each unit in all of the excavated architectural compounds, including those whose excavation was abandoned. The left-hand columns *(All contexts)* show the data from all excavated contexts. The right-hand columns *(Occupation contexts)* show only the data from those deposits that can be ascribed to the Late Horizon occupations (see Chapter 4, this volume). For most analyses here, only

Table 10.1. Frequencies of Ceramics Excavated from Residential Compounds at Hatunmarca (J2)

Archit. div. (AD)	Archit. subdiv. (ASD)	Freq. sherds AD	Freq. Inka AD	Percent Inka AD	Freq. sherds ASD	Freq. Inka ASD	Percent Inka ASD	Total sherds ASD	Total Inka AD	Percent Inka AD	Total sherds ASD	Total Inka ASD	Percent Inka ASD
1	1	20,770	2,577	12.4	5,428	710	13.1	15,459	2,293	14.8	3,626	549	15.1
	11				617	50	8.1				358	50	14.0
	12				19	0	0.0				7	0	0.0
	20				1,604	72	4.5				1,222	72	5.9
	50				1	0	0.0				1	0	0.0
	51				3,232	157	4.9				3,182	151	4.7
	52				1,221	37	3.0				309	11	3.6
	53				195	7	3.6				144	5	3.5
	54				5,430	881	16.2				3,928	797	20.3
	55				3,023	663	21.9				2,682	658	24.5
2	1	3,550	428	12.1	1,344	118	8.8	3,077	370	12.0	1,1 13	92	8.3
	11				81	17	21.0				81	17	21.0
	12				11	2	18.2				1	0	0.0
	50				1	0	0.0				0	0	0.0
	51				561	52	9.3				545	52	9.5
	52				550	74	13.5				505	74	14.7
	53				384	75	19.5				362	73	20.2
	54				358	45	12.6				358	45	12.6
	55				260	45	17.3				112	17	15.2
3	1	52,943	4,071	7.7	4,770	360	7.5	39,859	3,526	8.8	3,928	344	8.8
	51				75	10	13.3				73	10	13.7
	52				31,523	1,235	3.9				22,276	928	4.2
	53				6,673	937	14.0				4,225	740	17.5
	54				7,150	641	9.0				6,606	616	9.3
	55				2,752	888	32.3				2,751	888	32.3
4	1	5,449	15	0.3	528	4	0.8	2,945	15	0.5	366	4	1.1
	51				786	4	0.5				405	4	1.0
	52				3,523	7	0.2				2,174	7	0.3
	53				612	0	0.0				0	0	0.0
5	2	27,885	1,920	6.9	1,661	98	5.9	21,249	1,551	7.3	1,453	88	6.1
	50				586	102	17.4				0	0	0.0
	51				7,390	182	2.5				6,077	151	2.5
	52				8,088	605	7.5				5,726	539	9.4
	53				3,577	458	12.8				3,010	387	12.9
	54				4,402	295	6.7				3,145	244	7.8
	55				2,181	180	8.3				1,838	142	7.7
6	1	10,435	29	0.3	1,720	18	1.0	998	23	2.3	450	18	4.0
	51				302	5	1.7				289	5	1.7
	52				3,306	1	0.0				I	0	0.0
	53				40	0	0.0				40	0	0.0
	54				5,067	5	0.1				218	0	0.0
Total		121,032	9,040	7.5	121,032	8,280		83,587	7,778	9.3	83,587	7,778	9.3

Table 10.2. Frequencies of Ceramics Excavated from Residential Compounds at Marca (J54)

Archit. div. (AD)	Archit. subdiv. (ASD)	Freq. sherds AD	Freq. Inka AD	Percent Inka AD	Freq. sherds ASD	Freq. Inka ASD	Percent Inka ASD	Total sherds ASD	Total Inka AD	Percent Inka AD	Total sherds ASD	Total Inka ASD	Percent Inka ASD
1	1	49.446	6,923	14.0	6,984	821	11.8	38,728	5,747	14.84	5,448	671	12.3
	2				2,346	483	20.6				857	140	16.3
	20				3,994	269	6.7				2,529	202	8.0
	50				319	39	12.2				319	39	12.2
	51				1,881	226	12.0				1,559	196	12.6
	52				7,699	1,287	16.7				6,592	1,174	17.8
	53				3,816	568	14.9				2,941	499	17.0
	54				3,426	752	22.0				2,768	697	25.2
	55				5,148	800	15.5				3,998	639	16.0
	57				1,592	187	11.7				1,271	155	12.2
	58				1,935	132	6.8				654	39	6.0
	59				4,964	528	10.6				4,867	516	10.6
	60				5,342	831	15.6				4,925	780	15.8
2	1	10,926	1,166	10.7	1.134	145	12.8	9,016	1,054	11.69	1,048	140	13.4
	50				1	0	0.0				0	0	0.0
	51				1,236	281	22.7				1,231	276	22.4
	53				1,751	154	8.8				1,683	150	8.9
	54				1,105	182	16.5				1,071	178	16.6
	55				2,552	149	5.8				1,412	97	6.6
	57				1,421	105	7.4				945	84	8.9
	58				1,726	150	8.7				1,566	129	8.2
31		60		5	0	0.0		0	0		0	0	0.0
	52				I	0	0.0				0	0	0.0
4	20	7,056	1,420	20.1	2,318	579	25.0	5,713	1,191	20.85	1,779	433	24.3
	51				2,589	373	14.4				2,009	321	16.0
	52				2,149	468	21.8				1,925	437	22.7
5	1	573	41	7.2	155	14	9.0	208	23	11.06	85	11	12.9
	51				418	27	6.5				123	12	9.8
6	1	871	3	0.3	289	0	0.0	546	2	0.37	192	0	0.0
	51				224	1	0.4				10	0	0.0
	52				358	2	0.6				344	2	0.6
7	1	4,326	371	8.6	1,461	187	12.8	2,966	266	8.97	1,449	187	12.9
	51				59I	21	3.6				98	7	7.1
	52				1,140	41	3.6				771	27	3.5
	53				605	38	6.3				596	38	6.4
	54				529	84	15.9				52	7	13.5
8	1	557	15	2.7	83	6	7.2	399	13	3.26	83	6	7.2
	51				127	7	5.5				127	7	5.5
	52				99	2	2.0				1	0	0.0
	53				201	0	0.0				188	0	0.0
	54				46	0	0.0				0	0	0.0
	55				I	0	0.0				0	0	0.0
9	1	10,201	659	6.5	4.167	207	5.0	5,661	228	4.03	2,016	84	4.2
	51				6,030	452	7.5				3,645	144	4.0
	52				4						0	0	0.0
10	I	1,197	321	26.8	623	172	27.6	1,182	318	26.90	623	172	27.6
	51				354	93	26.3				340	90	26.5
	52				219	56	25.6				219	56	25.6
	53				1	0					0	0	0.0
Total		85,159	10.919	12.8	85.158	10.919	12.8	64.419	8,842	13.73	64,419	8.842	13.7

the ceramics from occupation contexts are considered, to ensure association of the activities that produced the assemblages.[3]

The Provincial Inka sherds from Marca and Hatunmarca provide conspicuous evidence of the use of imperial goods by the Xauxa in household and public activities. While we cannot yet estimate total numbers of vessels from numbers of sherds, the figures indicate that the Xauxa had access to thousands of Inka style vessels over the decades. Of the total 206,191 sherds recovered in the 1982–1983 excavations from these two towns, 19,959 (9.68%) were classified as being Provincial Inka. If only the occupation contexts are considered, 16,620 (11.23%) of the total 148,000 sherds recovered from these two sites are classed as Provincial Inka.

The fieldwork at Hatunmarca recovered 9,040 Inka sherds from partial excavations of about 25% of the surface area of an estimated 0.8% (6 of about 750) of the residential compounds. Because the sample was weighted in favor of the more elite residential areas, a straightforward extrapolation to the entire site is not warranted, but we may derive a ballpark notion of the scale of ceramic distribution involved. Taking a conservative view, if the bias inherent in the excavated sample from Hatunmarca causes us to overestimate the quantity of Provincial Inka ceramics by a factor of two, the residential areas would contain, roughly, 2,250,000 Provincial Inka sherds. Even assuming a tenfold overestimate, the residential areas would still contain about 450,000 Inka sherds. These figures do not take into account unoccupied terraces that form a major portion of each site along the lower perimeters, which would increase the estimate. For Marca, the same rough estimates produce bracketing figures of 330,000–1,640,000 Inka-style sherds in the residential

[3] In interpreting these data, we need to keep in mind three vexing chronological dilemmas. First, even if we take care to work with associated occupation contexts, the ceramics can best be understood as averaged assemblages that accumulated over 50 to 80 years, that is, over about two to four generations of occupation. We therefore need to be conservative about the kinds of conclusions that we admit based on these data. Second, the occupation levels of two of the major compounds excavated at Hatunmarca (J2=1) and Marca (J54=1) contain material remains that date to the Wanka IV period. Both yielded such articles as glass beads and iron knives, wheat, and cow and pig bone. This material is indicative of continued occupation during the four decades between the collapse of Inka power in the region in 1533 and the forcible resettlement of the population during Viceroy Toledo's *reducción* program of 1570–1572. Third, large areas of Hatunmarca, including compound J2=4, are thought to have been essentially abandoned under Inka rule; Inka sherds found in those areas are considered to have been deposited from activities other than occupation.

At present, it is difficult to assess the proportions of material remains recovered from the compounds that pertain to the imperial (Wanka III) or colonial (Wanka IV) eras, but some indirect evidence suggests that most ceramic remains belong to the Imperial era. We may note, first, the rapid decline of population around Hatun Xauxa in the early Colonial era. As early as 1535, Francisco Pizarro was griping that the local populace had fled to avoid being drafted for transport duties (Cobo, 1956:Vol. 2, Bk. 1, p. 284). Cook (1981:201) has also documented how the tributary population of the province declined from a late pre-Hispanic Inka census of 27,000 "men of war" (see Vega, 1965:181) to a tributary population of 6,953 in 1575. To the degree that they were measuring comparable statuses, the two censuses show a population decline of about 75% of the adult male population in about 50 years. Some of the decline may be attributable to the five-year Inka civil war that preceded the Spanish invasion, but most of the drop likely resulted from early colonial disease, war, and labor exactions. Second, state-style pots were made in controlled circumstances that logically were more appropriate for the Imperial era than for the chaotic first decades of Spanish rule. The association of Imperial Inka style vessels and European goods in graves suggests that the pre- *reducción* populace may have been drawing status from use of both Inka and Spanish matériel (see Owen and Norconk, 1987:129). Given these circumstances, it seems reasonable to surmise that the bulk of the state-style ceramic assemblage in the Wanka III–IV compounds was produced during the Imperial era, but that the usage and breakage that resulted in the archaeological deposits continued into the Colonial era.

compounds. Considering that the commoner compounds yielded percentages of Inka pottery about one-third to one-half that of the elite compounds, an overall estimate that falls about the middle of these brackets seems realistic; that is, total counts of over one million Inka sherds for each of these Xauxa towns are entirely within reason.

We may look at the numbers in a little more detail to get a sense of the quantities of sherds in individual compounds. Virtually complete excavation of compound J54=1, a Wanka III–IV elite residence on the northeast face of Marca, recovered 6,923 sherds in the imperial style. Similarly, partial excavations at the two central elite compounds of J2=1 (30% of area excavated) and J2=3 (13% excavated) at Hatunmarca yielded 2,577 and 4,071 imperial-style sherds, respectively. If we assume that the excavated samples are representative, complete excavation of J2=1 would yield about 8,590 Provincial Inka sherds and J2=3 would yield 31,315 similar sherds. Although these two architectural divisions (ADs) lay in the most elite area of Hatunmarca, they were probably not the highest-status compounds at the settlement.[4] The architectural complexes just to the north and south of J2=3 were larger and more elegant, and excavations there would likely yield notable quantities of Inka pottery.

The concentration of Inka ceramics in elite residential compounds, as measured by kg/m^3, is further reflected in Figure 10.2. Almost without exception, the elite compounds contain the highest densities of Inka sherds. The sole anomaly is AD J54=7, which may have actually been a retainer compound adjacent to J54=1 rather than an elite residence. The comparative robustness of this Inka pottery and the dominance of jars are indicated by the relatively large size of the sherds recovered. With one exception (J54=10), the amount of the entire Wanka III occupation ceramic assemblage taken up by Inka sherds is a higher fraction by weight than by frequency (Figure 10.3).

Despite the quantities of Inka pottery present, the state was not underwriting the basic domestic activities of even the highest status residents. Among the compounds sampled, the percentage of Inka pottery never exceeded more than about one-fourth of the total ceramics recovered. In the large compounds J2=1, J2=3, and J54=1, 85% to 90% of the ceramics were made in the local styles. AD J54=10 yielded the highest Inka component, 26.8% by frequency, but this compound may well have never been completed and occupied. Its ceramic assemblage may represent the detritus from nearby occupations, not in situ use during the Inka era (Earle *et al.,* 1987:72–73). In some more peripheral patio groups, such as J2=6 and J54=9, the percentage constituted by imperial style ceramics was about 5%.

All of these figures contrast starkly with the assemblages from Hatun Xauxa, at which 98.0% of the Inka-era pottery recovered was made in the imperial style. Even in the most elite compounds of the most elite Xauxa settlements, therefore, imperial-style pottery was a limited good. We may surmise that high social status conferred on a family group the privilege of using state pottery or, less benignly, the obligation to use Inka ceramics in certain activities. Elite status did not grant the right to be sustained with goods made entirely in the state style.

The apparent concentration of Inka pottery in elite residential areas—suggested by the contents of the excavated collections—is part of a more global pattern at Hatunmarca. The other chapters in this volume provide abundant evidence that the central compounds at this

[4] Unfortunately, the fieldwork that was funded to excavate in the most elite areas in 1988 was halted by the movement of Sendero Luminoso into the valley.

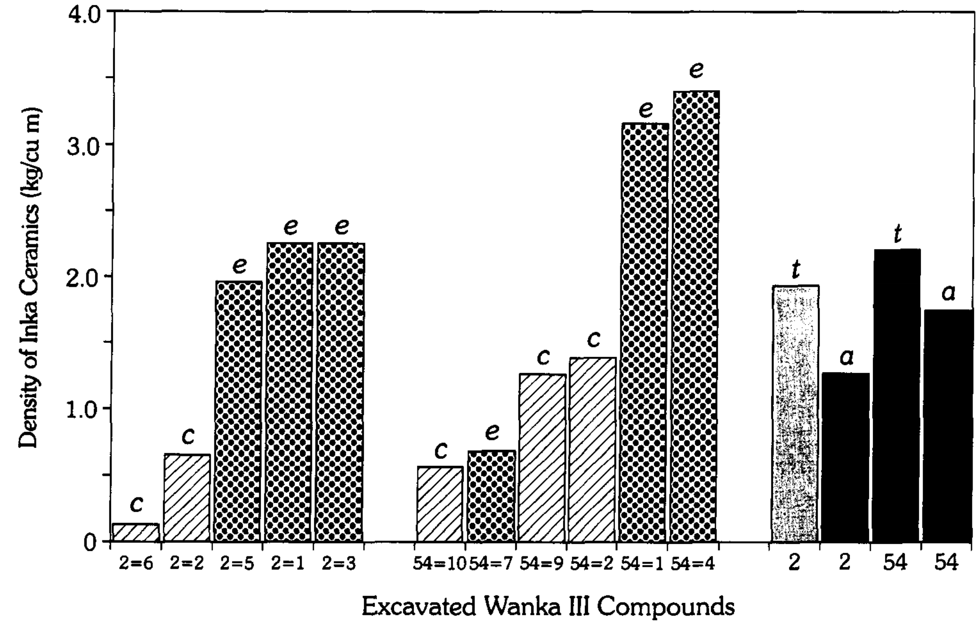

Figure 10.2. Densities of Inka ceramics (kg/m^3) from Wanka III excavated compounds at Hatunmarca (e.g., 2=6) and Marca (e.g., 54=10). Columns are labeled *e* (elite), *c* (commoner), *t* (total, or all collections summed for each site), or *a* (arithmetic average or mean of the density values for the architectural divisions from each site). The columns are ordered from the lowest to the greatest densities.

site exhibit a wide range of architectural, ecofactual, and artifactual remains indicative of elite residence. Elsewhere, I have shown that spatial autocorrelation analyses of Hatunmarca's 55 surface collections demonstrate a similar, close association of the Provincial Inka ceramic assemblage and elite architecture (D'Altroy, 1992:200–207). Whether the calculations are based on the frequencies or the percentages of Inka ceramics in the collections, there is less than a 5% probability of finding such a concentrated distribution of state-style pottery. This patterning indicates clearly that preferred access to state ceramics was closely related to a compound's location within the settlement.

The state pottery found in the households was probably used mostly for ceremonial hospitality. Its principal functions likely revolved around preparing and serving food and drink, along with limited storage. In keeping with the Inka propensity for order, we may surmise that the vessel forms were distributed in proportions appropriate to status and activities. It also seems reasonable to expect that the elite members of local society received the most, the finest, and the greatest variety of imperial ceramics to which subjects had access. Conversely, we would not expect subject households to have been the location of large-scale storage, especially given that the state built 3,000 storehouses in the main valley.

To assess these premises, the analytical assemblages were restricted to occupation contexts that likely resulted from a set of householding activities. The ceramic assemblages were therefore narrowed to only those compounds with clear, undisturbed Wanka III

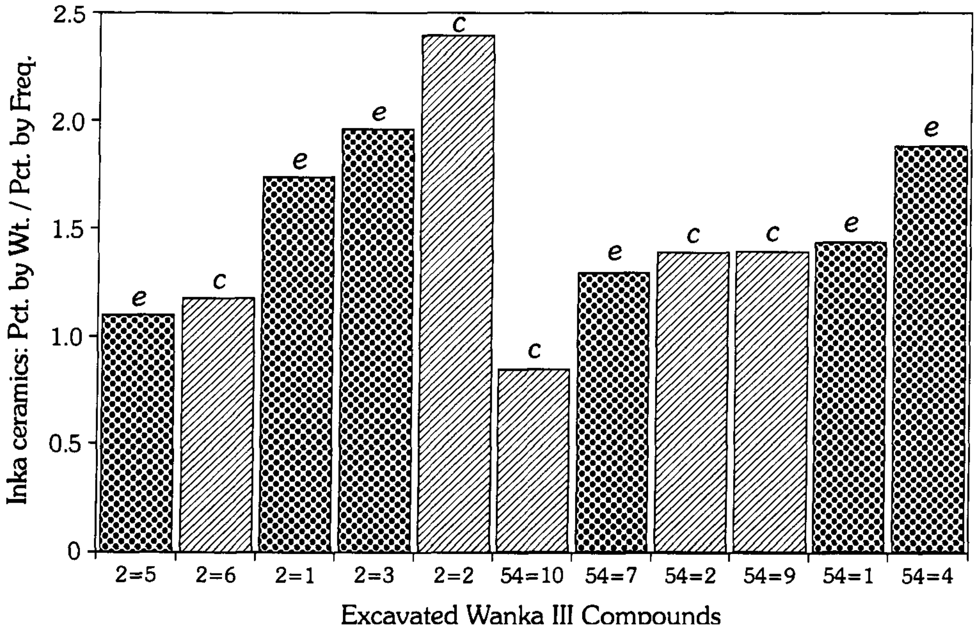

Figure 10.3. The ratio, of percent by weight against percent by frequency, that Inka sherds formed of each Architectural Division's entire ceramic assemblage. A value of 1.0 means that Inka ceramics represented the same percentage by weight and by frequency; 2.0 means that the Inkaceramics weighed twice as much as their frequency percent ofthe full assemblage would imply.

occupations: J2=1, J2=2, J2=3, J2=5, J54=1, J54=2, J54=4, J54=7, and J54=9.[5] Even given the Inka penchant for order, the redundancy of the assemblages is remarkable. The proportion of Inka ceramics classed as body sherds from closed vessels recovered from Hatunmarca (J2) ranges from 75.4% to 83.5% from each AD. From Marca (J54), the proportion ofclosed body sherds ranges from 72.3% to 80.7%. This distribution suggests that the physical bulk ofthe vessels most regularly provided to local households was made up of various jar forms, which is not surprising, considering thatjars tend to be much bigger than plates.

Figures 10.4a and 10.4b illustrate the regularity in the frequency distribution ofthe Inka assemblages across households at both sites, among the sherds classifiable to vessel category. In these graphs, the ADs for each site are arranged from smallest to largest (left to right), with summed totals at the right end of the figure. In all ADs at both sites, the vessel forms fall into two groups. The more frequently represented set of forms consists of flared-rim and otherjar forms, whereas the more minor fraction includes plates, bowls, and

[5] This winnowing removed three compounds whose excavation was abandoned in the field because of disturbed contexts (J54=3, J54=5, J54=8), one that was apparently only occupied during Wanka II (J2=4), and two that contained mixed assemblages (J2=6, J54=10). In this analysis, the lower, Wanka II and mixed Wanka II–III levels of compounds J2=1 and J2=3, were eliminated to ensure that the collections be as clearly attributable to the Inka era occupation as possible.

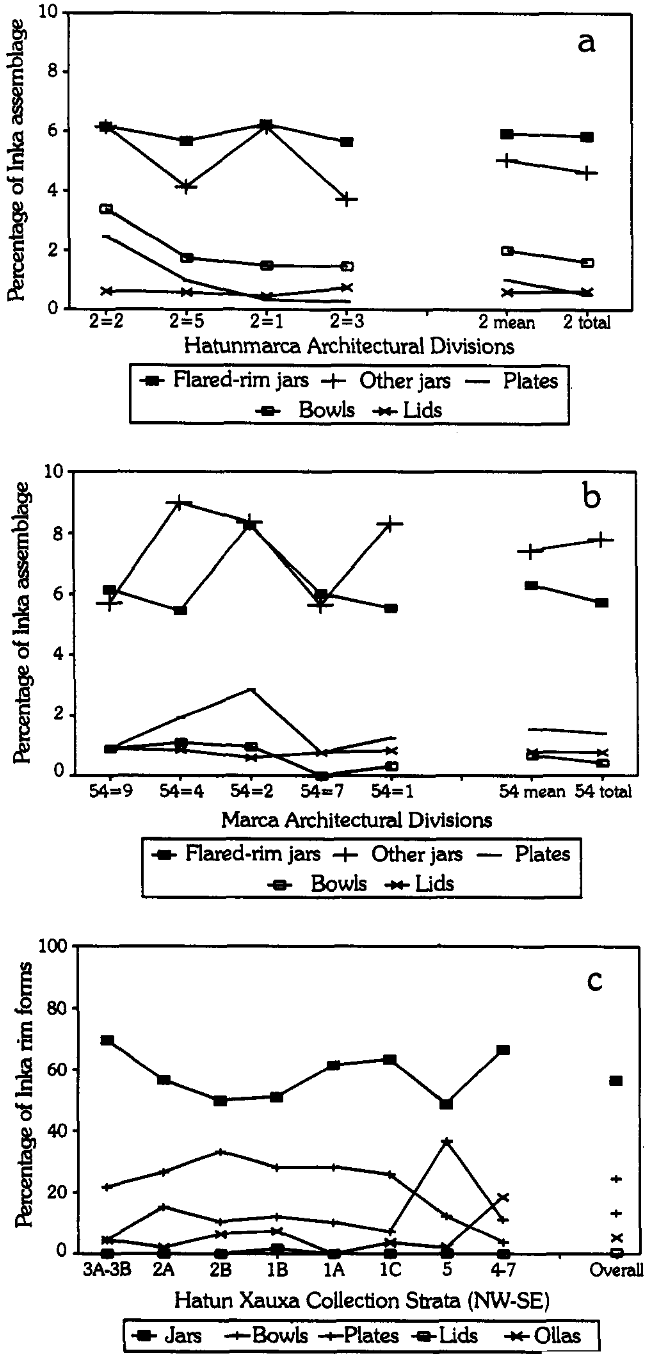

Figure 10.4. Frequency distribution of the major vessel shapes in the Provincial Inka assemblages across households (a) at Hatunmarca; (b) at Marca; and (c) from the surface collections at Hatun Xauxa, loosely ordered from the northwest to the southeast end of the site.

pot lids. In eight of the nine compounds, the proportion of the total Inka assemblage assigned to flared-rim jar sherds lies between 5.5% and 6.1%. There is somewhat more variation in the other jar forms, but the overall percentages parallel those of the flared-rim jars fairly closely, Without exception, bowls are the next most frequent form in these nine ADs. Pot lids, most likely from pedestal-base cooking vessels, invariably constitute 0.5% to 1.0% ofthe assemblages. Finally, the proportion ofthe entire Inka assemblage constituted by plate fragments fluctuates around 1.0%. The pattern is consistent across residential compounds and sites, None of the compounds was obviously specialized in only one ofthe principal activities for which imperial-style ceramics were used, whether brewing, cooking, serving, or storing.

The regularity of the assemblages, however, masks subtle differences in proportions of different vessel forms recovered in the excavations. Most obviously, the larger, more elite residences have higher proportions ofjar rims, as shown in Figures 10.4a, 10.4b and 10.5a.[6] In Figure 10.5a, the distributions of jar, bowl, and plate rims are graphed for each AD as a percentage of the total of the three rim forms. The ADs are arranged from smallest to largest, left to right, for Hatunmarca (rim $N = 438$) and Marca ($N = 559$). In these figures, there is a general trend toward higher percentages ofjar rims as the area of the AD increases in both sites.

The greater proportion of jar rims in the elite excavated rim collections comes at the expense of plate rims. The plate rims from Hatunmarca trend down from the smallest AD, J2=2 (21.6% plates of summed jar, bowl, and plate rims), to J2=1 (5.0%) and J2=3 (5.1%), which are the largest, most elite ADs. In contrast, bowl rims make up a more consistent proportion, about 20–30% of this rim subassemblage. A similar trend is visible in the bars illustrating Marca's excavated ADs. Figure 10.5a emphasizes this trend by standardizing the frequency of these rims against a value of 100 set for each AD's jar-rim frequency. For example, in AD J2=2, for every 100 jar rims recovered, we would expect to find about 61 bowl rims and 44 plate rims. In J2=3, for every 100 jar rims, we would find 44 bowl rims and 8 plate rims.

What do these data imply about the differences among compounds? Two trends have already been noted: The architecturally elite compounds contain both more and higher percentages of Inka ceramics. A third difference is illustrated in the relative proportions of the rims just discussed. The size of the compound is generally proportional to the ratio of jar rims to plate rims within each site; the larger the compound, the higher the proportion of jars. In terms of activities, this trend implies that the elites emphasized storage or *chicha* brewing using Inka jars to a greater degree than did the residents of the smaller compounds. Finally, some of the rarer Inka forms, such as tumblers and miniatures, are similarly concentrated in the more elite compounds, although high-necked bottles, also a scarce form,

[6] The rim-sherd proportions regrettably do not directly reflect the proportions of vessels of each shape in use at any time during the occupation of these residential compounds. Because we do not yet have reliable data on breakage rates that would allow us to assess use-lives and replacement rates of the pots, these data are best interpreted as palimpsest assemblages that accumulated over 50 to 80 years. Information was collected on the proportion of rim circumference represented by each rim sherd, but the analysis of these data remains to be completed. Once those data are analyzed, we will have a better understanding of proportions of the collections constituted by complete vessels coming from different vessel shapes. This study, unfortunately, will still not inform us as to vessel breakage rates. Similarly, the data on changes in assemblage composition over time from the two clearly stratified deposits in J2=1 and J2=3 remain to be fully evaluated.

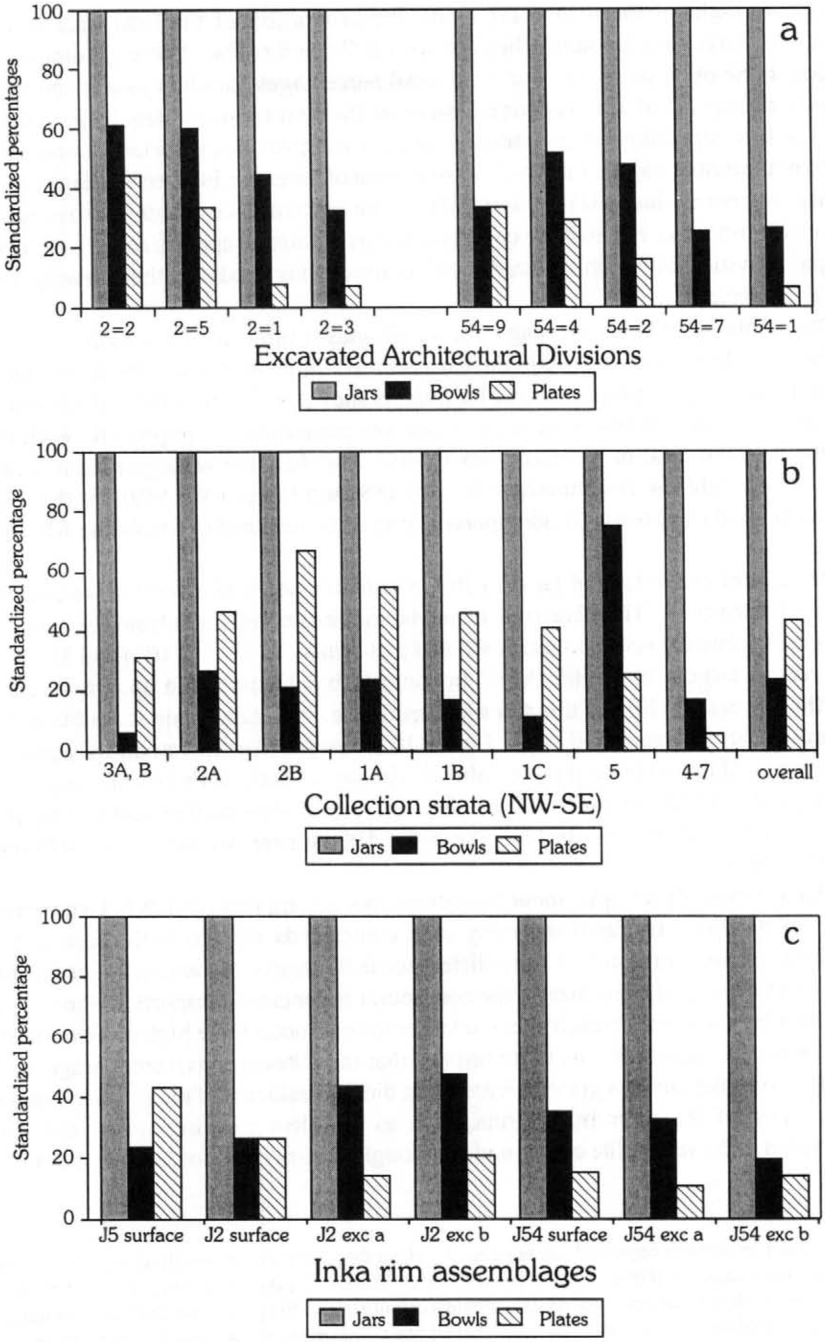

Figure 10.5. (a) Proportions of jars, bowls, and plates at Hatunmarca and Marca, standardized against jar rim frequencies, for excavated collections; (b) standardized proportions of same vessels from surface collections at Hatun Xauxa, loosely ordered from NW to SE; (c) standardized proportions of same vessels at the three sites, for pooled surface and excavated collections.

were more widely distributed.[7] The significance of the small vessels is not obvious, although they may have been used in rituals, much like the ceramics found in *qhapaq ucha* ceremonial caches.

COMPARISONS WITH THE SURFACE ASSEMBLAGE FROM HATUN XAUXA

Although Marca and Hatunmarca were the region's largest towns under Inka rule, they were a far rung below Hatun Xauxa in the sociopolitical hierarchy. We would therefore not expect their residences to contain the same array of vessels as found at the state provincial center, where the Cuzco-style assemblage made up 98.0% of the Late Horizon pottery recovered in seventeen surface collections across the site. Specifically, how the assemblages from the towns and center differed is nonetheless an intriguing issue. Because the sample from Hatun Xauxa is entirely from the surface, we do not have the same control over the contexts of recovery as we do with the towns.[8] However, all samples were recovered using analogous methods of stratified random sampling, which should have yielded fairly representative samples ofthe materials from the settlement (Table 10.3; see D'Altroy, 1992).

Composition of Assemblages

Before comparing the Inka center to the local towns, a summary of the center's assemblage is in order. The sample from Hatun Xauxa contains 5,596 Inka-style sherds, 449 of which are identifiable rim forms. The distribution of the five most frequently encountered rim forms from the surface collections at the settlement is illustrated in Figure 10.4c. In this graph, the line height represents the percentage of the Inka sherds that jars, bowls, plates, *ollas,* and pot lids constitute in each surface collection stratum. The collection strata in the graph are loosely ordered in a sweep from the northwest part of the site (3A–3B) through the center (1A), to the far eastern sector (4–7).

In a pattern similar to that of Marca and Hatunmarca, jars are the dominant rim form, constituting a little less than 60% of the rims belonging to these five forms (237 rims, or 52.8% of the entire rim assemblage). In contrast to the household assemblages from the Xauxa towns, however, plates are the second most frequently found form in all collection strata except those in the southeastern part of the site.[9] The percentage of bowl rims generally falls in the 20–30% range. The only real anomaly is Stratum 5, in which 18 bowl rims were recovered in a collection with a radius of 5 m.

Without describing the patterning at Hatun Xauxa in detail (see D'Altroy, 1992:111–114), I would like to draw attention to one global pattern. Figure 10.5b graphs the proportions of each of the three most frequently recovered rim forms — jars, bowls, and

[7] Because of the sample size effect, in which the diversity of a sample is directly related to its size (see Thomas, 1989), we need to be careful about overinterpreting this point, however

[8] See footnote 4

[9] This pattern roughly parallels the recovery rates for three of the five surface collection strata reported by Morris and Thompson (1985:77) for Huánuco Pampa

Table 10.3. Distribution of the Inka Ceramics from Surface Collections at Hatun Xauxa, Marca, and Hatunmarca

		Jars	Plates	Bowls	Total		Jars	Plates	Bowls	Total		Jars	Plates	Bowls	Total
	J2 AD	Rim Freq./ % of AD	Rim Freq./ % of AD	Rim Freq./ % of AD	Rim Freq.	J54 AD	Rim Freq./ % of AD	Rim Freq./ % of AD	Rim Freq./ % of AD	Rim Freq.	J5 Surf.	Rim Freq./ % of AD	Rim Freq./ % of AD	Rim Freq./ % of AD	Rim Freq.
	1	100	7	32	139	1	268	17	70	355	3A-3B	16	5	I	22
		71.9	5.0	23.0			75.5	4.8	19.7			72.7	22.7	4.5	
	2	18	8	11	37	2	63	10	30	103	2A	30	14	8	52
		48.6	21.6	29.7			61.2	9.7	29.1			57.7	26.9	15.4	
	3	115	9	51	175	4	45	13	23	81	2B	24	16	5	45
		65.7	5.1	29.1			55.6	16.0	28.4			53.3	35.6	11.1	
	5	45	15	27	87	7	8	0	2	10	1B	64	35	15	114
		51.7	17.2	31.0			80.0	0.0	20.0			56.1	30.7	13.2	
						9	6	2	2	10	1A	24	11	4	39
							60.0	20.0	20.0			61.5	28.2	10.3	
											1C	54	22	6	82
												65.9	26.8	7.3	
											5	24	6	18	48
												50.0	12.5	37.5	
											4,6,7	18	I	3	22
												81.8	4.5	13.6	
Grand total		278	39	121	438		390	42	127	559		254	110	60	424
Grand total %		63.5	8.9	27.6			69.8	7.5	22.7			59.9	25.9	14.2	
Mean of AD %		59.5	12.3	28.2			66.4	10.1	23.4			62.4	23.5	14.1	

plates—standardized against the jar rims. This figure shows that plates make up a higher proportion toward the center of the site. Bowls follow this spatial pattern less clearly, whereas jars are predominant toward the site's periphery. The collections with the highest proportion of plates in their assemblages were also those with the largest jars, although the pattern is not exceptionally strong. Collection stratum 2B stands out especially in this regard, having both the largest mean flared-rim jar diameter and highest percentage of plates, although nearby Stratum 1 B exhibits a similar pattern. The central part of Hatun Xauxa, from which those collections were obtained, is the area of densest pottery and best-preserved architecture. At this point, we cannot state with assurance the range of activities pursued there, but it seems reasonable to surmise that the area was given over largely to elite residence or hospitality.

We may now compare these data to those recovered from Marca and Hatunmarca. Jars were the most frequently recovered form in all collections, followed by bowls and plates, and then forms associated with cooking, such as *ollas* and pot lids. Comparison with the excavated collections recovered from Hatunmarca and Marca described earlier shows that the same basic patterns hold. Figure 10.5c graphs the frequencies of jars, bowls, and plates standardized against the jar-rim frequencies for all surface and excavated collections. The excavated data are represented in two ways: (1) as percentages calculated from the sum of all sherds recovered from the occupation contexts (52 exc a, J54 exc a), and (2) as a mean of the percentages of each AD (52 exc b, J54 exc b). The intent of including the latter was to reduce the effect of the disproportionate sample sizes from the differing ADs. This graph illustrates a couple of significant points. First, with the exception of the J2 surface data, all collections from Marca (J54) and Hatunmarca (J2) show that, for every 100 jar rims, we would expect to recover between 10 and 20 plate rims. The bowl rims are more variable but exhibit markedly higher values than the plates for the most part. This pattern contrasts with the overall pattern from the Hatun Xauxa (J5) surface collections, in which the mean ratio of jar rims to plate rims is about 100 to 44, whereas bowl rims are about half that of the plates. A second, methodological point is that the surface collection proportions from both Xauxa towns are consistent with, although not identical to, the more intensive excavated assemblages. This finding lends some credence to other conclusions based on data drawn from the surface collections.

Jar Sizes

Because vessels of different sizes were likely used for different activities, comparing the sizes of the vessels recovered from the two towns and the state center may provide some insight into assemblage use. Most storage associated with Hatun Xauxa was found in the *qollqa* on the hills to the west of the center, where about 1,069 storehouses lay within 1 km. It therefore seemed probable that the jars found within the center itself were used for preparation and serving of food and drink rather than long-term bulk storage. A similar range of activities has been postulated for Marca and Hatunmarca, even though the balance among vessel types differed. Figures 10.6a and 10.6b illustrate the jar-rim size distributions of the pooled collections from the three sites. The distribution of the Hatun Xauxa rims is graphed as a line over the Marca and Hatunmarca bar charts to show their correspondence. These graphs show that the local households had access to a range of jar sizes comparable

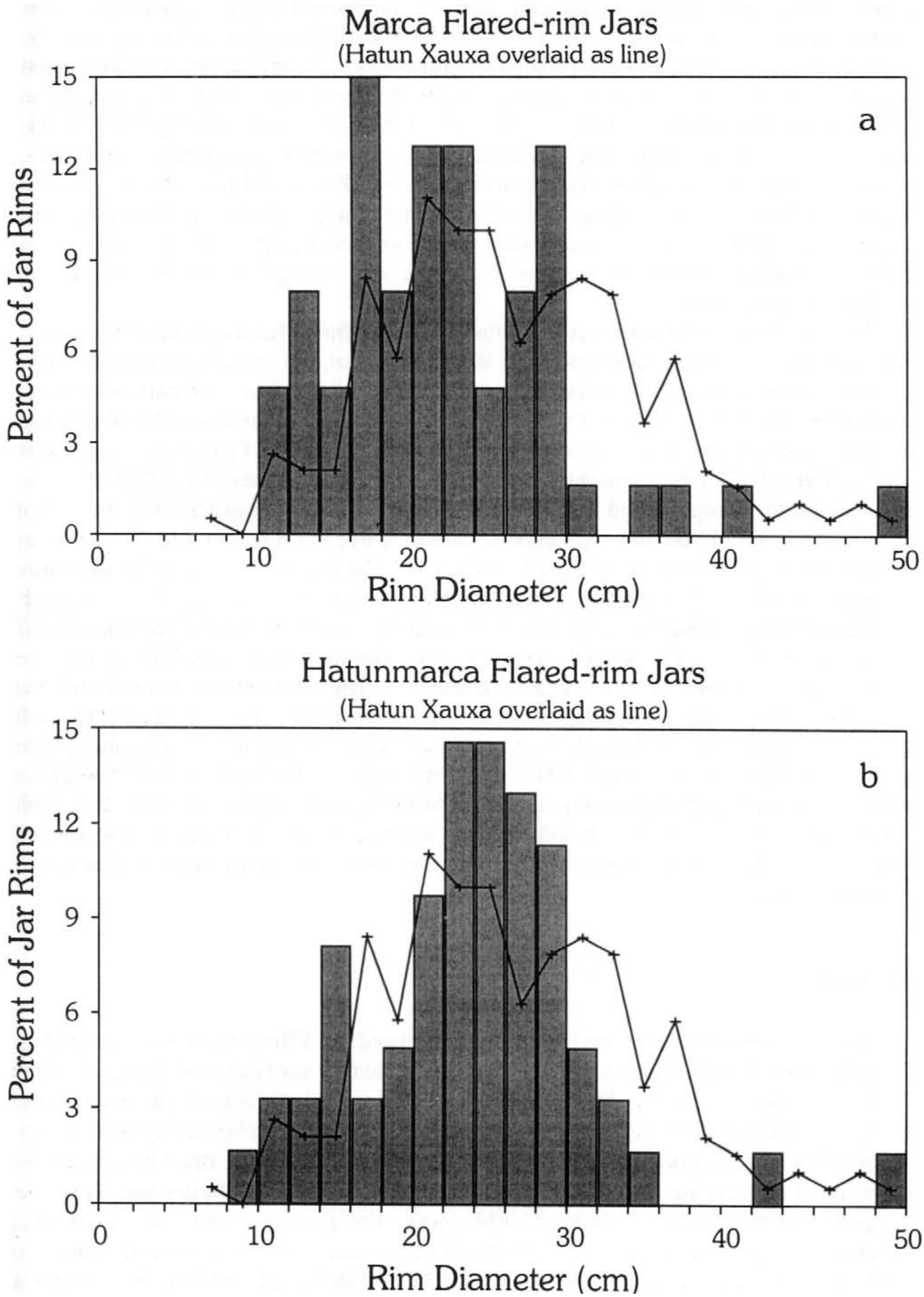

Figure 10.6. Size distributions of the pooled flared-rim jar collections (bars) from (a) Marca and (b) Hatunmarca, compared to sizes for comparable vessels from Hatun Xauxa (lines).

to those recovered from Hatun Xauxa. The main difference between the center and the two towns lies in the higher proportion of jars with rim diameters >30 cm at Hatun Xauxa, perhaps indicating more emphasis on large-scale brewing or storage.

Summary

Despite the widespread distribution of Inka pots among the subject populace, there were marked differences between the ceramic assemblages of the imperial center and subject towns. Most obviously, the state center used Cuzco-style polychrome ceramics almost exclusively. In contrast, even in the most elite areas studied in Marca and Hatunmarca, the percentage of the ceramics accounted for by Inka pots never surpassed one-fourth of the entire assemblage and was usually less than 15%. The remainder of the assemblages from Marca and Hatunmarca were local domestic wares, which were almost entirely missing from Hatun Xauxa. Additionally, the assemblages from the state center were more diverse both functionally and compositionally. With respect to particular vessel forms, the major difference among sites lay in the distribution of plates. Hyslop (1984) has suggested that this form was the most widely distributed Inkavessel shape empirewide. Because we cannot yet firmly correlate rim-sherd frequencies with numbers of vessels in use at any given time, it is not possible to assess Hyslop's observation concretely. However, the proportions of plates at the Inka center far exceeded those of the two local towns, lending credence to Morris's (1971) suggestion that these serving vessels were used in high-status activities.

CONCLUSION

The pervasiveness of Cuzco-style polychrome ceramics in the residences of native society provides vivid evidence for the state's role as material and symbolic sponsor of political relations, linking the state to the smallest social units of the Upper Mantaro region (see Costin and Earle, 1989). In this context, the Inkas were not simply reinforcing ties established on other grounds. They were constructing relationships that stood to benefit the state and, more selectively, the local elites. The distribution of pottery in a specific style and in specific forms advanced the state's ability to define sociopolitical relationships. In this light, Morris (Morris and Thompson, 1985) has suggested that the character of state rule in the provinces was built more on ceremony than on coercion. To the degree that this view is accurate, the use of Inka pottery in contexts previously employing local wares would have routinely reinforced the notion of the rulers as beneficent lords. From a less sanguine perspective, the Inka pottery would have constantly drawn attention to the state's intrusion into affairs that had formerly been within the bailiwick of independent local elites.

The Provincial Inka ceramics bore the Inka trademark emphases on labor-intensiveness, standardization, control of raw resources, and visual distinction. Together, these features imply that state overseers closely managed the manufacture and distribution of some goods used to undertake activities on the state's behalf. The hierarchical way pots were parceled out provides an alternative gauge of state control. At both Marca and Hatunmarca, the elite households contained more Inka pots, a higher proportion of jars, a greater variety of Inka forms, and a higher proportion of Inka ceramics in their assemblages than did the commoners. Sociopolitical position thus conferred privilege and obligation.

In summary, the Inkas appear to have used their distinctive pottery as a tool to build and reinforce ties with the subject populace in the Upper Mantaro. The amount of labor entailed in making the pottery was probably low in comparison to activities such as farming or weaving. However, the durability and visibility of the pottery, especially at key moments in political and ceremonial life, likely provided a pointed reminder of the state's immediacy.

Chapter 11

The Economy of Metal and Shell Wealth Goods[1]

Bruce Owen

The most obvious markers of social status in most cultures are material goods. To understand who has which goods and how they move through a society is to understand a great deal about that society's socioeconomic structure and the strategies used by individuals and institutions to manipulate the system of goods and status for their own ends. Often the most telling goods are those that concentrate considerable value in a durable, portable object. These "portable wealth goods" are key elements in the socioeconomic game, because in comparison to food staples, buildings, people, or other more substantial goods, they are easily stored, displayed, and distributed.

This study reconstructs aspects of the economy of metal and shell wealth goods among the Xauxa of the Yanamarca Valley, Peru, and how it changed when the Xauxa were conquered and subsumed into the Inka empire. The archaeological data show that metal and shell goods were valued, and even suggest a relative ordering of the values of materials and forms. The study evaluates competing models of the functions of wealth goods under the Inka and suggests some strategies that were used by the Inka state and the local Xauxa elites as they negotiated power and control in the Yanamarca Valley.

Portable wealth goods can be more carefully defined as objects that store value and are easily exchanged. An object stores value when it is durable, it is the product of expending scarce resources such as rare or imported materials, or skilled or gross labor, and it is in demand; that is, people are willing to expend the resources necessary to secure it. These criteria are matters of degree. There will always be extreme cases such as the scarcely portable millstone-sized "coins" of Yap (Beauclair, 1963) or the perishable bulbs of the Dutch tulipmania (Garber, 1989) that nevertheless can reasonably be treated as portable wealth goods with interesting aberrations. For similar and fuller definitions, see Earle's (1982) "primitive valuables," Haselgrove's (1982) "prestige goods," and their citations.

The demand for a wealth good depends upon its function in the broadest sense. An object's function can be practical, or *technomic,* in Binford's (1962) terms, as in the case of a bronze chisel. If bronze, bronze-working labor, or their equivalents in exchange are scarce resources that people are willing to expend in order to get bronze chisels, then bronze chisels are wealth goods. An object's function can also be social, or *sociotechnic* (Binford, 1962).

[1] This paper is a slightly revised revision of a manuscript submitted in July 1992. More recent and complete chemical composition data and implications for the transition from arsenic bronze to tin bronze are summarized in Bezur and Owen (1996).

An example is a piece of jewelry used to affirm social status by connoting the holder's access to sufficient resources or connections to acquire it.

The technomic or sociotechnic function of an object, such as the use of a chisel to cut wood or a necklace to indicate above-average access to resources, might be called its *primary utility.* An object's primary utility is distinct from its *secondary utility* in strategies for manipulating social relations, that is, its utility as an object in reciprocity relations engendered by gift giving, payment, and perquisites of office, and in legalistically controlled distributions such as those regulated by sumptuary rules.

It is because of this secondary utility that many of the utilitarian metal items in this analysis, such as bronze needles, can reasonably be considered to be "wealth." Acquiring utilitarian bronze items would have required an expenditure of resources comparable to those needed to get bronze adornments, which were presumably valued largely for their sociotechnic function. Goods with technomic primary utility might have just as much secondary utility for the person or institution distributing them as goods with sociotechnic primary utility. Whether a political subordinate is dependent upon a superior for bronze tools or for bronze ornaments, the secondary utility of the object in maintaining the relation of dependence could be equally effective in controlling the subordinate's behavior. For some types of analysis, it is clearly important to differentiate wealth goods with principally technomic functions from those with principally sociotechnic functions. For others, it may not be important whether one person uses wealth goods for technologically productive ends, while another uses them for display. Both individuals are wealthy, and both are enmeshed in similar networks of obligations because of the channels through which they receive and give away the objects.

WEALTH AMONG THE XAUXA

Among the Yanamarca Valley Xauxa, a variety of items served as wealth goods. Fine textiles would have been among the most important (Murra, 1962). Unfortunately, textiles, like feathers and wooden wealth goods, are so rarely preserved in central sierra sites that archaeologists can say little about them. Highly decorated ceramics were certainly wealth goods among the Xauxa and are discussed in detail by Costin (Chapter 9, this volume). This chapter focuses on the nonceramic wealth goods for which there is good archaeological evidence: objects made of metal and shell.

The distributions of metal and shell wealth goods before and after the Inka conquest suggest changes in Xauxa socioeconomic stratification (see Costin and Earle, 1989) and highlight some of the social and political strategies used by elites in a chiefdom society (Wanka II), by local elites subsumed into an expansionist state (Wanka III), and by the institutions of the state itself (Inka). Ultimately, comparisons of these strategies with analogous ones among European Bronze Age chiefdoms (e.g., Haselgrove, 1982; Coles, 1981), complex chiefdoms in Oceania (e.g., Kirch, 1984; Earle, 1987b), Mesoamerican states (e.g., Pollard, 1987) and others may show regularities in the distribution and manipulation of wealth goods with increasing social stratification and complexity because there are relatively few effective strategies for players to choose.

MODELS OF XAUXA AND INKA WEALTH ECONOMIES

Moore (1958), working primarily with textual sources and existing interpretations, laid out a general model for local wealth economies in Inka times, in which both local elites and the Inka state maintained craftsmen who produced wealth goods. The local elites gave wealth goods produced by their craftsmen to higher Inka officials and state institutions as customary gifts or tax payments and kept some for their own use. The state in turn redistributed both the received wealth goods and those produced by state-supported specialists back down the institutional hierarchy as payments, gifts, and perquisites of office. D'Altroy and Earle (1985) elaborated this model, adding an explicit contrast between strategies based on staples and those based on wealth goods, and stressing state manipulation of these systems for the purposes of control and efficiency. They suggest that the Inka state flexibly adapted and co-opted preexisting local wealth economies that differed from region to region in their degrees of market exchange and convertibility of goods.

The general model of the flow of wealth goods under the Inka raises the question of what the local elites gained from participation in this exchange. If local elites controlled their own craftsmen and state production was supported by the staple and labor tribute that the local elites mobilized, then it would be to the local elites' advantage to minimize their participation in the state system as far as Inka coercive power allowed. This disengagement would reduce the involvement of middlemen and increase the net return of goods to the local elites who arranged for their production. Yet it is clearly not in the interest of an expansive empire to be viewed as burden by the officials who support it. Instead, the state could be expected to manipulate the wealth economy such that cooperation with the state would be beneficial to local elites.

Meyers (1985) suggested that Inka wealth goods with sociotechnic functions might not have served simply to advertise or legitimate high status, but rather could have been explicit keys or "bank passes" entitling the bearer to well-defined rights such as access to goods warehoused by the state. One result of establishing such regulations and symbols would be to give the elites a material interest in the state hierarchy that supplied these "bank passes" and the system that provided access to other goods.

Costin and Earle (1989) explored Inka strategies for manipulating both staple and wealth economies to maximize control and efficient exploitation of the Yanamarca Xauxa. In the wealth sphere, they suggested that the Inka introduced new symbolic referents controlled by the state, ranging from Cuzco-style ceramics to cast ornaments of tin bronze (see Costin et al., 1989). Through association with the powerful and distant imperial center, these goods came to replace those controlled by local elites for the purposes of advertising and legitimizing status. This orchestrated shift in ideology and iconography of wealth goods would have made local elites more dependent upon the state for their position, and so more loyal to state institutions.

QUESTIONS ABOUT XAUXA AND INKA WEALTH ECONOMIES: PRIMARY UTILITY

The technomic functions of the metal and shell wealth goods are not problematic and are discussed here with the description of the basic data. The primary sociotechnic functions, however, are open to at least three possibilities that will be considered in light of the archaeological data. First, some wealth goods may have been displayed to publicize the holder's access to scarce resources and so to legitimate his or her implied or explicit claim to high socioeconomic status and its associated general privileges (Moore, 1958; Murra, 1962; D'Altroy and Earle, 1985; Costin and Earle, 1989; Earle, 1987b). Second, other wealth items may have had explicit meanings attached to them, specifically, that the bearer of a certain object was identified as a person with the right to "make a draft upon the treasury" an arbitrary number of times without surrendering the object (Meyers, 1985). Such an explicit identifying function would presumably make sense only in Inka times, which was the first time in the Mantaro that large quantities of goods were stored outside of elite domestic contexts (see Earle, 1987b). Third, some or all wealth goods may have been sufficiently exchangeable for other goods or labor ("convertible"; see Earle, 1982; D'Altroy and Earle, 1985; Earle, 1987b; Meyers, 1985) that they were regularly used for payments or balanced reciprocal exchanges, and were valued for their utility in such exchanges.

QUESTIONS ABOUT XAUXA AND INKA WEALTH ECONOMIES: SECONDARY UTILITY

There are two general ways in which Xauxa elites and Inka officials might have manipulated the wealth economy to advance their own sociopolitical ends, taking advantage of the secondary utility of wealth goods. First, both local elites and the Inka state could have distributed the wealth goods in their control to individuals that they wanted to influence. To understand Xauxa and Inka strategies in the wealth economy, it is important to consider which social strata had access to which types of wealth goods, how exclusive that access was, and whether those goods tended to move up the social hierarchy, down it, or both. Distribution strategies in turn would involve maximizing one's access to wealth goods, by both arranging to receive them from others and supporting craftsmen to produce them. So a key consideration is to what degree production of wealth goods was controlled by local elites, the Inka state, or both.

Second, both local elites and the state could have tried to manipulate the rules of the wealth economy itself by imposing taxes or "gift" obligations, or by introducing new types of wealth goods that could more easily be controlled or substituted for others. Influencing the volume of production or the restrictions on distribution of certain goods, and hence their supply, could also have been a long-term strategy for increasing or decreasing their relative value in the wealth economy.

THE EXCAVATED MATERIALS

The data analyzed here are from UMARP's 1982 and 1983 field seasons. Earlier and later seasons are omitted because the contexts of the material are not strictly comparable in the phase–status framework described below. Of the 1982 and 1983 material, only occupation contexts of known status and Wanka II or Wanka III phases are included. Fill, mixed contexts, earlier and later deposits, wallfall, and other poor contexts are excluded to ensure that the four phase and status categories (Wanka II and III, commoner and elite) are

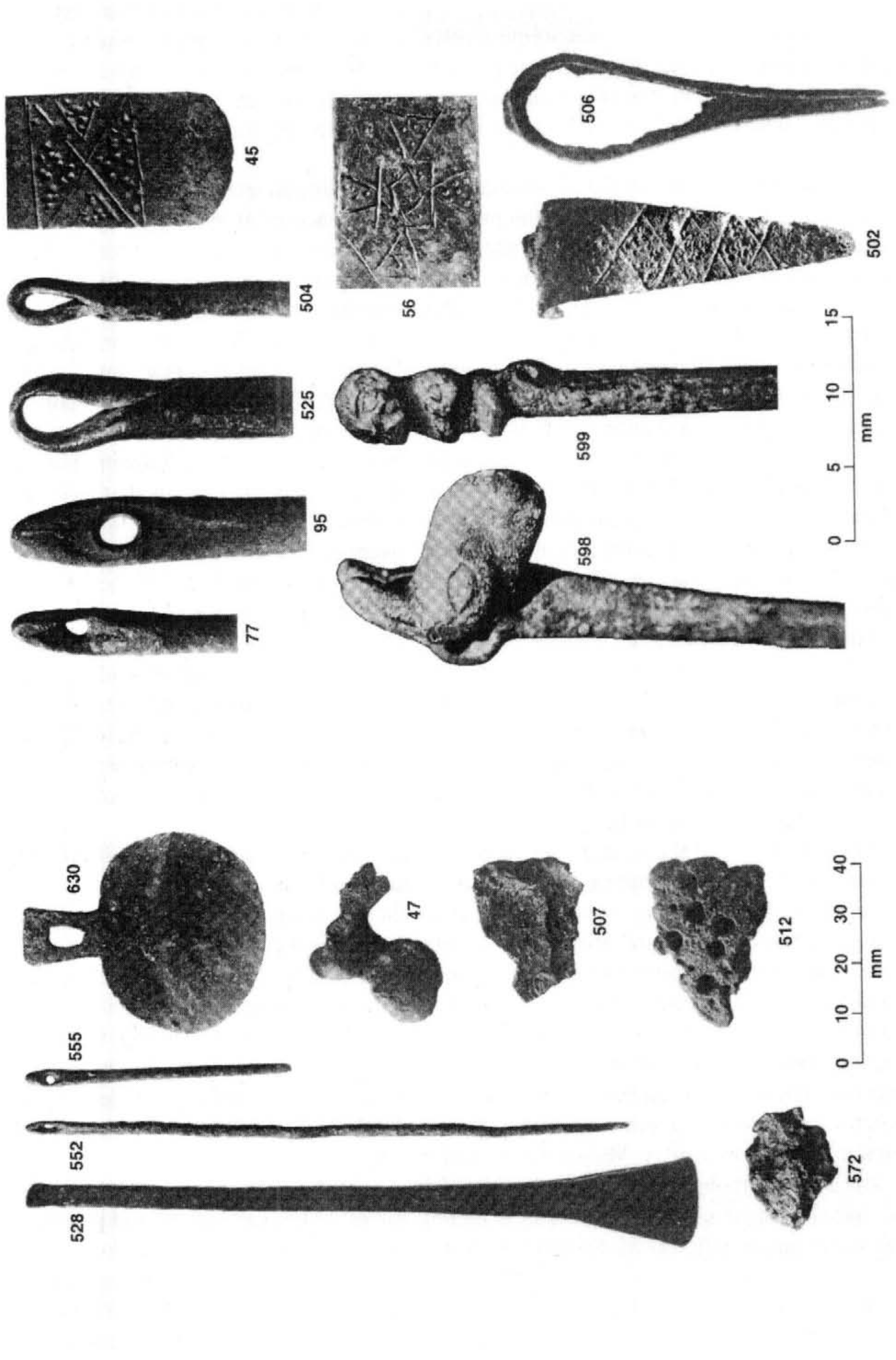

Figure 11.1. Copper and bronze artifacts. Disk 660 includes two loops of string above the hole. The long shafts of items 581,557,526,548,511,98, and 78 are not show Items 581, 526, 527,570,78,509, and 93 had small samples removed for chemical and metallographic analyses prior to the preparation of these illustrations. They ai shown approximately as found, with the samples restored, based on earlier drawings and photographs.

accurately represented by the analyzed material. Burial contexts are excluded because burials may have been placed in abandoned patios by people who did not live in them.

UMARP recovered 267 objects of metal and related materials such as ore minerals. The objects quantitatively considered here are limited to the 56 copper objects, 32 silver objects, 12 lead objects, and 8 pieces of ore minerals that satisfy the context requirements. These objects are listed in Tables 11.1 and 11.2, and a few examples are illustrated in Figures 11.1 and 11.2.

Some of the metal objects have been analyzed to determine their chemical compositions. Tables 11.1, 11.2, and 11.3 identify the presence or absence of at least 1% of tin in the copper objects from good occupation contexts that have been chemically analyzed. These analyses are compiled from several runs of different analytical methods, including atomic absorption spectrophotometry and standardless semiquantitative electron dispersion spectroscopy. All the pieces that look like silver are called silver here, even though subsequent work has shown that some contain small amounts of lead and many have copper in the range of 20 to 40 percent (Howe and Petersen, 1994). Objects that look like copper are called copper, even though some of the Wanka II "copper" objects contain enough arsenic (over 1%) to be called arsenic bronzes, and most of the Wanka III "copper" objects are in fact tin bronzes (over 1% tin), both with and without arsenic. Objects that look like lead are called lead, even though some might also contain silver.

Of the identifiable metal objects, more than half were evidently used for adornment and display; that is, their primary utility would have been largely sociotechnic. These "display goods" comprise perforated sheet metal disks that were probably sewn on clothing, decorative *tupu* pins worn by women to secure their clothing, a necklace ornament or pendant, and a pair of decorated tweezers that would likely have been worn around the neck on a string. These uses are well attested by ethnographic observations and documentary sources (e.g., Bandelier, 1910:74–75; Guaman Poma de Ayala, 1980, illustrations), and analogy to similar objects found complete with cloth and string in mummy bundles from the dry Peruvian coast (Baessler, 1906; Uhle collection, Phoebe Hearst Museum; objects on display, Museo Nacional del Perú).

Fewer than half of the identifiable metal objects were utilitarian; that is, their primary utility would have been technomic. These "utilitarian goods" comprise needles evidently used for sewing and weaving, *bola* weights that would have been tied to cords and used for hunting and possibly warfare, small chisels suitable for woodworking, undecorated tumi knives used for general cutting tasks, and a piece of lead used to repair a cracked or broken ceramic vessel. These interpretations are based on analogy to traditional Andean weavers, documentary evidence (e.g., Guaman Poma de Ayala, 1980 illustrations), analogy to coastal finds of chisels complete with hafts, smooth cut marks on wooden artifacts, the sharpening marks and extreme wear on many *tumi* knives, and comparison to intact examples of pre-Columbian ceramics repaired with lead (Baessler, 1906; Uhle collection, Phoebe Hearst Museum; objects on display, Museo Nacional del Perú; etc.).

The remaining objects include production debris or stored raw material in the form of solid, usually irregular chunks, resulting from refining or casting processes, and pieces of sheet scrap, some with cut marks and others stacked and folded together as though for remelting. Several items, though complete, have not been identified, and numerous fragments of needle or *tupu* shafts and bits of sheet cannot be classified further. Additional objects of the same general nature but from excluded contexts will be mentioned as

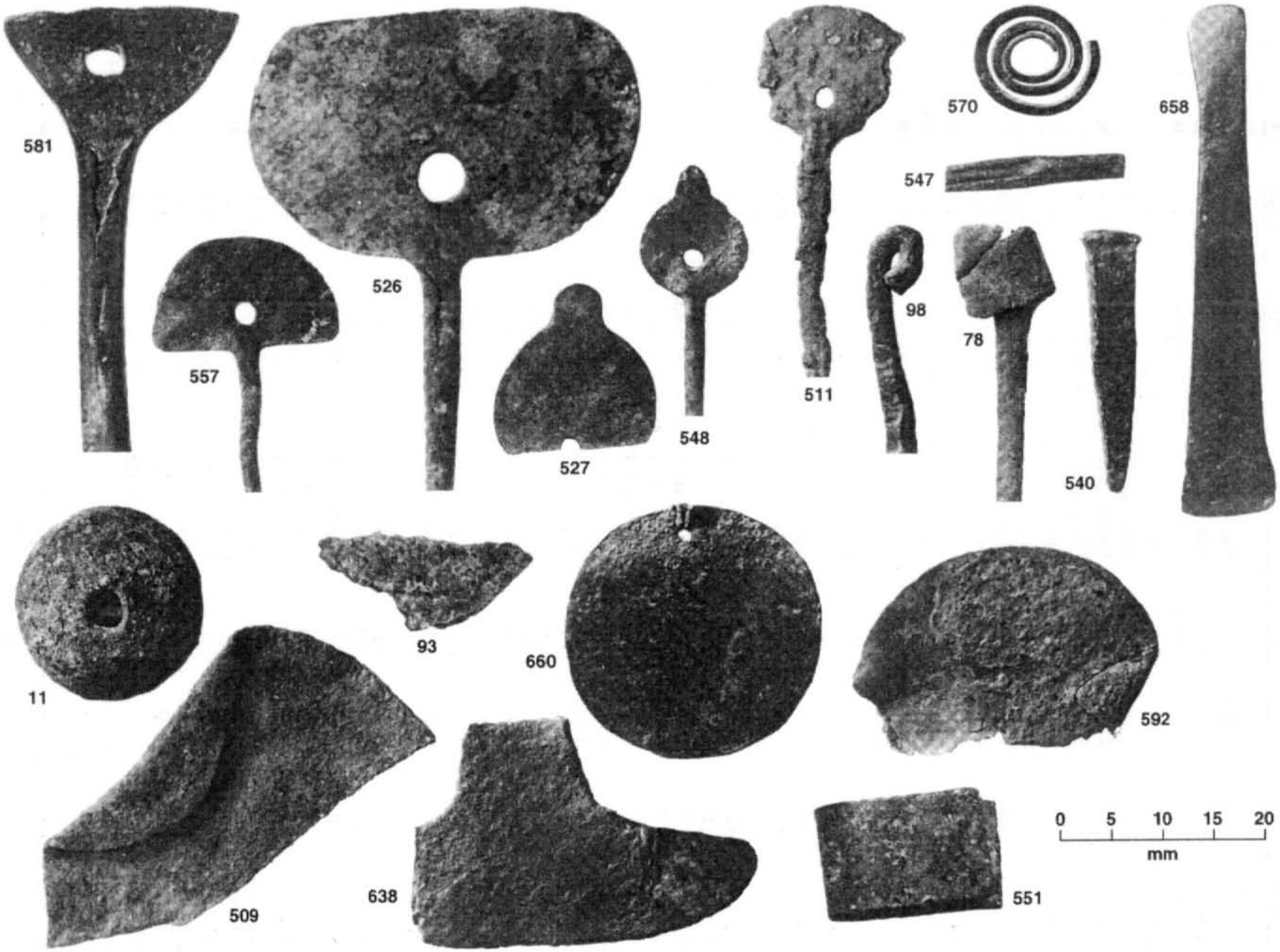

Figure 11.2. Copper and bronze artifacts. Disk 630 was bent in antiquity, and is shown in a reconstructed view approximately as it would have appeared originally. The illustrations of items 77, 95, 525, 504, 45, 598, 599, and 56 show details, not the complete objects. Items 630, 47, 507, and 572 had small samples removed for chemical and metallographic analyses prior to the preparation of these illustrations. They are shown with the samples restored, based on earlier drawings and photographs.

Table 11.1. Wanka II Metal Objects Used in Quantitative Analysis

Provenience	Phase	Status	Metal	Type	Display/ Utilitarian	Grams	Tin?	ID
2=4-51-2-2-1	WII	Comm.	Cu	Needle	Utilitarian	1.9	No	555
7=1-2-1-1-1	WII	Comm.	Cu	Shaft fragment	N/A	3.6	No	66
7=8-2-3-2-1	WII	Comm.	Cu	Disk	Display	1.1	No	592
41=4-51-2-3-1	WII	Comm.	Ag	Sheet scrap	N/A	1.7		594
41=5-52-1-2-1	WII	Comm.	Cu	Ore (malachite)	N/A	2.3		596
2=3-52-2-10-1	WII	Elite	Cu	Square "nail"	N/A	6.9	No	540
2=3-52-4-8-1	WII	Elite	Pb	Ore (galena)	N/A	37.5		546
7=2-5-1-2-1	WII	Elite	Pb	Sheet	N/A	0.1		79
7=2-52-2-1-1	WII	Elite	Ag	Disk	Display	0.2		68
7=2-52-2-1-1	WII	Elite	Pb	Sheet	N/A	1.5		69
7=2-53-6-1-1	WII	Elite	Ag	Disk	Display	0.8		67
7=2-54-2-1-1	WII	Elite	Cu	Sheet	N/A	1.2	No	76
7=2-54-4-1-2	WII	Elite	Cu	Needle	Utilitarian	4.2	No	77
7=2-58-3-1-1	WII	Elite	Cu	Tupu	Display	2.3	No	78
7=3-2-1-2-3	WII	Elite	Cu	Needle	Utilitarian	1.0		80
7=3-51-1-2-1	WII	Elite	Ag	Disk	Display	0.4		72
7=3-51-1-2-1	WII	Elite	Ag	Disk	Display	0.3		73
7=3-51-1-2-2	WII	Elite	Ag	Disk	Display	0.3		74
7=3-51-1-2-2	WII	Elite	Ag	Disk	Display	0.5		75
7=3-52-1-1-1	WII	Elite	Ag	Disk	Display	0.7		70
7=3-52-4-1-1	WII	Elite	Ag	Disk	Display	0.3		71
7=7-2-1-2-1	WII	Elite	Ag	Disk	Display	0.8		576
7=7-2-3-2-1	WII	Elite	Pb	Crude bola weight	Utilitarian	23.7		577
7=7-2-3-2-1	WII	Elite	Pb	Crude bola weight	Utilitarian	26.2		578
7=7-2-3-2-1	WII	Elite	Pb	Crude bola weight	Utilitarian	27.1		579
7=7-2-3-2-1	WII	Elite	Pb	Crude bola weight	Utilitarian	20.5		580
7=7-3-1-1-1	WII	Elite	Ag	Disk	Display	0.3		582
7=7-3-1-1-1	WII	Elite	Ag	Disk	Display	0.7		583
7=7-3-1-1-1	WII	Elite	Ag	Disk	Display	0.5		584
7=7-3-1-1-1	WII	Elite	Ag	Disk	Display	0.7		585
7=7-3-1-1-1	WII	Elite	Ag	Disk	Display	0.6		586
7=7-3-1-1-1	WII	Elite	Cu	Tupu	Display	6.9		581
7=7-51-1-1-1	WII	Elite	Ag	Disk	Display	0.5		587
7=7-51-1-2-1	WII	Elite	Pb	Chunk	N/A	3.2		588
7=7-51-3-1-1	WII	Elite	Ag	Disk	Display	0.6		589
7=7-52-1-2-1	WII	Elite	Ag	Disk	Display	0.8		590
7=7-52-1-2-1	WII	Elite	Pb	Mend for broken ceramic	Utilitarian	11.0		649
7=7-53-1-2-2	WII	Elite	Cu	Shaft fragment	N/A	1.9		625
7=7-53-1-3-1	WII	Elite	Ag	Disk	Display	1.1		591
41=1-1-4-2-1	WII	Elite	Cu	Needle	Utilitarian	3.6	No	81
41=1-53-3-5-2	WII	Elite	Ag	Sheet scrap	N/A	0.5		87
41=1-53-4-4-1	WII	Elite	Cu	Needle	Utilitarian	3.3		88
41=3-55-4-2-1	WII	Elite	Ag	Sheet scrap	N/A	0.2		89
41=8-52-1-1-1	WII	Elite	Cu	Casting excess	N/A	43.4		627
41=8-52-2-2-1	WII	Elite	Ag	Disk	Display	0.4		628
41=8-52-2-2-1	WII	Elite	Ag	Tupu	Display	91.6		636

appropriate. All of these metal objects, other than ore minerals, are considered wealth goods for this analysis. They are all durable, embody scarce resources and labor, and could have been exchanged easily. Since even scraps of metal can be remelted and made into new valuables, it is reasonable to suggest that all metal in any form would have been in demand, meeting the final requirement for being considered a wealth good. In fact, the preferential access to metals by elites, described later, tends to confirm the suggestion that metals were valued materials in any form.

Shell objects were less numerous than metals. A total of 122 shell objects were recovered by UMARP from 1977 through 1983, of which only 37 satisfy the context requirements for this analysis. About half of the excluded pieces come from Wanka IV contexts. The shell used in this analysis is listed in Table 11.4. It includes 1 piece of *Spondylus* shell (5 were recovered from all contexts), 30 pieces of various other marine shells, 5 pieces worked from the lip of an unidentified large land snail shell that may have come from the eastern slopes of the Andes, and one unidentified shell. Most of the shell was cut or drilled, generally into one of a few forms that were probably beads or bangles to be sewn on clothing.

ANALYTICAL METHODS: THE COMMONER–ELITE DISTINCTION

This analysis is based on two crosscutting divisions of Xauxa society and history. The first is the temporal division between the chiefdoms of Wanka II and the Inka empire of Wanka III, operationally defined by ceramic assemblages. The second is between what UMARP identified as "commoner" and "elite" social status groups within each temporal phase. Patio groups were classified as commoner or elite before excavation, based on the quality of masonry, number and size of structures, patio area, and proximity to the site's central plaza (see Chapter 2, this volume). The distributions of fancy and imported ceramics, metals, shell, preferred food remains, and various other artifact categories confirmed all but one of the preexcavation status assignments (Costin and Earle, 1989; Hastorf, 1990b).

It is unclear whether the commoner and elite categories reflect a bimodal distribution of status markers or the extremes of a unimodal range of variation. Nor is it known what fraction of the Xauxa population was elite and what fraction was commoner. Costin and Earle (1989) use an estimate of 5% elites, while this analysis uses 10% elites in situations where it is useful to consider trends that characterize the entire society.

A more serious concern with the status groupings is that although the highest status Xauxa residences are probably represented in the Wanka II elite sample, the equivalent highest-status families in Wanka III may have moved off the sites studied and into the Inka provincial center of Hatun Xauxa, where they would not appear in the Wanka III elite sample (Earle et al., 1980a). This sample bias would produce exactly the sorts of trends interpreted by Costin and Earle (1989), Hastorf (1990b), Costin et al. (1989), and others (this volume) as a general leveling of status differences under the Inka. It is currently impossible to evaluate this potential source of error.

Table 11.2 Wanka III Metal Objects Used in Quantitative Analysis

Provenience	Phase	Status	Metal	Type	Display/ Utilitarian	Grams	Tin?	ID
2=2-1-2-3-1	WIII	Comm.	Cu	Disk	Display	0.5	No	523
2=2-53-1-3-1	WIII	Comm.	Cu	Needle	Utilitarian	1.2		524
2=2-55-1-1-1	WIII	Comm.	Cu	Needle	Utilitarian	9.8	>1%	525
2=6-1-3-2-1	WIII	Comm.	Cu	Shaft fragment	N/A	2.7		568
2=6-1-4-2-1	WIII	Comm.	Cu	Spiral (fm. tupu?)	Display	0.8		570
2=6-54-2-3-4	WIII	Comm.	Cu	Casting excess	N/A	10.9	No	572
54=2-1-2-4-1	WIII	Comm.	Cu	Sheet	N/A	0.4		93
54=2-1-2-4-1	WIII	Comm.	Pb	Crude bola weight	Utilitarian	168.8		94
54=2-53-1-4-1	WIII	Comm.	Cu	Needle	Utilitarian	5.2		95
54=2-55-2-3-1	WIII	Comm.	Cu	Shaft fragment	N/A	9.6		96
54=2-57-1-4-1	WIII	Comm.	Cu	Needle	Utilitarian	3.4		97
54=2-58-2-3-2	WIII	Comm.	Pb	Casting excess	N/A	0.4		201
54=2-58-2-4-1	WIII	Comm.	Cu	Tupu	Display	3.4		98
54=9-1-1-2-1	WIII	Comm.	Ag	Disk	Display	2.5		651
54=9-1-1-2-1	WIII	Comm.	Ag	Tupu	Display	1.7		652
54=10-1-1-3-1	WIII	Comm.	Cu	Ore (malachite)	N/A	39.1		680
54=10-1-2-2-1	WIII	Comm.	Cu	Chisel	Utilitarian	5.1	>1%	658
74=1-1-2-2-1	WIII	Comm.	Cu	Ore (malachite)	N/A	30.0		693
2=1-1-1-3-1	WIII	Elite	Cu	Tupu	Display	8.9		598
2=1-1-1-3-1	WIII	Elite	Cu	Tweezers	Display	0.8		502
2=1-1-1-3-1	WIII	Elite	Ag	Disk	Display	0.4		501
2=1-1-2-3-1	WIII	Elite	Cu	Needle	Utilitarian	1.6		504
2=1-1-2-3-1	WIII	Elite	Cu	Tiny fragment	N/A	0.1		505
2=1-1-3-3-1	WIII	Elite	Cu	Casting excess	N/A	9.1	No	507
2=1-1-3-3-1	WIII	Elite	Cu	Sheet	N/A	1.7	>I%	604
2=1-1-4-3-1	WIII	Elite	Ag	Disk	Display	0.4		510
2=1-1-4-3-1	WIII	Elite	Cu	Sheet	N/A	4.5		509
2=1-1-4-3-1	WIII	Elite	Cu	Tupu	Display	1.7		511
2=1-1-4-3-2	WIII	Elite	Cu	Casting excess	N/A	22.5	No	512
2=1-51-2-2-1	WIII	Elite	Pb	Ore (galena)	N/A	37.2		519
2=1-55-2-3-1	WIII	Elite	Pb	Crude bola weight	Utilitarian	40.4		522
2=3-1-1-3-1	WIII	Elite	Cu	Ore (malachite)	N/A	3.8		682
2=3-1-2-3-1	WIII	Elite	Cu	Chisel	Utilitarian	18.4		528
2=3-1-2-3-1	WIII	Elite	Cu	Tupu	Display	4.8		526
2=3-1-2-3-1	WIII	Elite	Cu	Tupu	Display	0.8		527
2=3-1-4-3-1	WIII	Elite	Ag	Disk	Display	0.4		530
2=3-52-1-5-1	WIII	Elite	Cu	Needle	Utilitarian	3.1		533
2=3-52-3-5-1	WIII	Elite	Cu	Sheet	N/A	2.1		543
2=3-53-1-5-1	WIII	Elite	Cu	Sheet rolled into tube	N/A	0.3		547
2=3-53-2-2-1	WIII	Elite	Cu	Tupu	Display	1.6		548
2=3-53-3-2-1	WIII	Elite	Cu	Shaft fragment	N/A	0.8		624
2=3-53-3-2-1	WIII	Elite	Cu	Needle	Utilitarian	1.2		550
2=3-53-4-2-1	WIII	Elite	Cu	Sheet	N/A	2.1		551
2=3-53-4-3-1	WIII	Elite	Cu	Needle	Utilitarian	4.4		552
2=3-54-1-1-1	WIII	Elite	Pb	Chunk	N/A	135.4		554
2=3-54-1-4-1	WIII	Elite	Cu	Tupu	Display	3.6		599
2=3-55-1-2-1	WIII	Elite	Cu	Shaft fragment	N/A	0.5		647
2=3-55-1-3-1	WIII	Elite	Cu	Shaft fragment	N/A	0.6		648
2=3-55-2-3-1	WIII	Elite	Pb	Ore (galena)	N/A	93.6		675
2=5-2-1-1-1	WIII	Elite	Ag	Disk	Display	0.3		556

(continued)

Table 11.2 *(continued)*

Provenience	Phase	Status	Metal	Type	Display/ Utilitarian	Grams	Tin?	ID
2=5-2-2-1-1	WIII	Elite	Cu	Ore (malachite)	N/A	11.6		683
2=5-51-1-1-1	WIII	Elite	Cu	Tupu	Display	3.1		557
2=5-52-2-3-1	WIII	Elite	Cu	Shaft fragment	N/A	3.2		559
2=5-53-2-2-1	WIII	Elite	Ag	Disk	Display	0.2		566
54=4-20-1-2-1	WIII	Elite	Cu	Shaft fragment	N/A	1.6		629
54=4-20-1-2-1	WIII	Elite	Cu	Disk with suspension tab	Display	7.0	>1%	630
54=4-51-1-2-1	WIII	Elite	Cu	Disk	Display	2.3		633
54=4-51-1-2-1	WIII	Elite	Cu	Shaft fragment	N/A	1.0		632
54=4-52-2-3-1	WIII	Elite	Cu	Shaft fragment	N/A	0.3		634
54=7-1-1-3-3	WIII	Elite	Cu	Sheet cut to tumi shape	N/A	3.0		638
54=7-1-2-3-1	WIII	Elite	Ag	Tupu	Display	1.8		650
54=7-1-4-3-1	WIII	Elite	Ag	Disk	Display	0.1		640

Table 11.3. Copper Objects Tested for Tin Content But Not Used in Quantitative Analysis Because of Questionable Provenience, Unknown Status, or Excavation Prior to the 1982 and 1983 Seasons

Provenience	Phase	Status	Metal	Type	Display/ Utilitarian	Grams	Tin?	ID
7=7-3-1-1-1	WII	Elite	Cu	Tupu (in root zone)	Display	6.9	No	581
41=1-2-2-3-1	WII	Elite	Cu	Shaft fragment (in till)	N/A	2.3	No	84
66=702-0-0-3-1	WIII	Comm.	Cu	Casting excess (pre-1982)	N/A	53.4	No	28
2=1-1-3-3-1	WIII	Elite	Cu	Tupu (in burial)	Display	3.9	>1%	639
2=1-1-4-4-1	WIII	Elite	Cu	Casting excess (in fill)	N/A	2.9	No	513
54=7-51-1-2-1	WIII	Elite	Cu	Tupu (in fill)	Display	2.3	>1%	641
54=7-54-1-3-1	WIII	Elite	Cu	Casting excess (in fill)	N/A	4.0	>1%	642
2=701-0-0-3-3	WIII	?	Cu	Axe fragment	Utilitarian	76.4	>1%	14
2=701-0-0-3-3	WIII	?	Cu	Cast bola weight	Utilitarian	50.1	>1%	10
2=701-0-0-3-3	WIII	?	Cu	Cast bola weight	Utilitarian	24.7	>1%	11

Table 11.4. Shell Objects Used in Quantitative Analysis

Provenience	Phase	Status	Taxon	Form	ID
41=6-1-2-2-1	WII	Commoner	Oliva sp.	Ornament	94
41=7-1-2-2-1	WII	Commoner	Oliva peruviana	Cut ornament	95
2=3-52-4-8-1	WII	Elite	Oliva sp.	Cut ornament	67
7=2-2-4-3-1	WII	Elite	Pectinidae	Unidentified form	80
7=2-5-2-2-1	WII	Elite	Pectinidae	Drilled ornament	56
7=2-5-2-2-1	WII	Elite	Pectinidae	Worked	57
7=2-52-1-1-1	WII	Elite	Pectinidae	Unidentified form	58
7=3-1-1-2-1	WII	Elite	Spondylus sp.	Worked	59
7=3-51-2-2-1	WII	Elite	Oliva peruviana	Cut ornament	117
7=3-51-2-2-1	WII	Elite	Oliva peruviana	Cut ornament	118
7=3-52-1-1-1	WII	Elite	Unidentified marine sp.	Unidentified form	81
7=3-52-2-2-1	WII	Elite	Thais sp.	Drilled ornament	60
7=3-55-1-1-1	WII	Elite	Land snail	Simple large bead	82
7=3-55-1-1-3	WII	Elite	Land snail	Simple large bead	83
7=3-55-2-1-1	WII	Elite	Land snail	Simple large bead	84
7=7-3-3-2-1	WII	Elite	Oliva sp.	Cut ornament	85
41=1-1-2-2-1	WII	Elite	Unidentified marine sp.	Unidentified form	87
41=1-51-1-2-4	WII	Elite	Land snail	Simple large bead	90
41=1-51-1-2-4	WII	Elite	Unidentified sp.	Simple large bead	91
41=1-51-1-3-4	WII	Elite	Oliva peruviana	Cut ornament	119
41=1-51-1-3-4	WII	Elite	Mytilidae	Unidentified form	88
41=1-51-2-3-4	WII	Elite	Land snail	Simple large bead	89
41=1-51-4-4-5	WII	Elite	Unidentified marine sp.	Cut ornament	120
2=6-1-2-2-1	WIII	Commoner	Oliva peruviana	Cut ornament	75
54=2-1-2-4-4	WIII	Commoner	Unidentified marine sp.	Unidentified form	105
54=2-55-2-3-1	WIII	Commoner	Oliva peruviana	Unknown form	122
54=10-5 1-4-3-1	WIII	Commoner	Unidentified marine sp.	Worked	123
74=1-52-0-0-1	WIII	Commoner	Donax peruvianus	Unmodified	128
2=1-1-3-3-1	WIII	Elite	Choromytilus chorus	Unidentified form	65
2=3-53-1-5-1	WIII	Elite	Unidentified marine sp.	Unidentified form	68
2=3-53-2-2-1	WIII	Elite	Unidentified marine sp.	Unidentified form	69
2=3-53-3-4-1	WIII	Elite	Unidentified marine sp.	Drilled ornament	72
2=3-53-3-4-1	WIII	Elite	Oliva peruviana	Cut ornament	71
2=3-54-2-1-1	WIII	Elite	Oliva sp.	Cut ornament	74
2=3-55-1-2-1	WIII	Elite	Unidentified marine sp.	Drilled hole	115
54=4-52-1-2-1	WIII	Elite	Mesodesma donacium	Unidentified form	106

There is also some site-level bias in the status distinctions in Wanka III. Table 11.5 shows that commoner and elite households are about equally distributed among the Wanka II sites, In the Wanka III sample, however, the elite group includes more households at Hatunmarca (J2), while the commoner group includes more households at Marca (J54) and two smaller hamlets (J59 and J74). Marca was primarily occupied in Wanka III and is closer to the Inka center of Hatun Xauxa, while Hatunmarca is farther from the Inka center and was occupied during both Wanka II and Wanka III. There may also be site-level differences in microethnicity and accessibility of natural resources. Because the number of wealth goods is so low, the present analysis is based primarily on categories lumped by phase and status rather than categories further divided by sites. This allows enough objects to fall into each category for some trends to be apparent, but it means that this analysis, like all UMARP status analyses, is based on the assumption that the site biases do not introduce important errors.

ANALYTICAL METHODS: UBIQUITY AND DENSITY MEASURES

Most of the metal and shell data are analyzed in terms of ubiquity, also known as "percent presence," which summarizes presence–absence data as the percentage of excavated proveniences ("loci") in which one or more of the objects were present (Popper, 1988; Pearsall, 1989). Alternative measures would be number of objects per unit volume excavated ("count density" or "standard density") or mass (grams) of objects per unit volume excavated ("mass density"). Ubiquity was adopted over these two alternative measures for several reasons. Ubiquity is well suited to describing distributions of isolated items with occasional clusters or exceptionally large examples. Metal objects were usually isolated finds but, occasionally, several items would be found in the same locus. Shell objects were often found in clusters of two or three in a single locus. Each of these clusters

Table 11.5. Distribution of Analyzed Occupation Loci (Discrete Excavated Proveniences) by Site within Phase and Status Groupings: Wanka II Commoner and Elite Samples Represent Slightly Different Site Samples, While the Wanka III Commoner and Elite Samples Represent Considerably Different Site Samples

	Commoner			Elite		
	Site ID#	Number of loci	Percentage of loci	Site ID#	Number of loci	Percentage of loci
Wanka II	J2	39	10	J2	55	8
	J7	177	45	J7	373	59
	J41	176	45	J41	200	32
Wanka III	J2	91	23	J2	236	65
	J54	224	56	J54	127	35
	J59	23	6	J59	0	0
	J74	59	15	J74	0	0

Table 11.6. Grouped Standardization Data for Ubiquity, Mass Density, and Count Density [a]

	Status	Number of loci	Total corrected occupation volume, in m^3
Wanka II	Commoner	255	35.7
	Elite	411	46.8
Wanka III	Commoner	233	21.7
	Elite	229	30.3

[a] Table includes only occupation contexts of known volume, phase, and status excavated in 1982 and 1983.

probably represents a single item in terms of use, such as a shirt with several metal bangles or a necklace with several shell pendants. By giving equal weight to a locus with one disk or three, ubiquity values are not skewed by occasional clusters as is count density. Similarly, ubiquity is less sensitive than mass density to occasional unusually large objects. Since most metal objects were small, a single very large piece (of which a few were recovered, see Tables 11.1 and 11.2) would completely dominate a distribution pattern presented in terms of mass density.

Ubiquity also tends to compensate for differences in soil deposition rates, which were pronounced between sites in the Yanamarca study area (Costin, 1986; Russell, 1988). Since ubiquity counts presence by locus, and loci are defined by stratigraphy, a thin layer on a site with slow soil development is treated as equivalent to a thick layer on a site with rapid soil development. Assuming that the cultural activities producing these layers and the excavation criteria for recognizing them are similar from site to site, ubiquity will automatically reflect the cultural processes of deposition events and not the geological processes of soil development. UMARP analyses based on densities, including a few in this discussion, generally use "corrected volumes" (Table 1 1.6) calculated by multiplying the real volume by a site factor that standardizes intersite densities of groundstone artifacts thought to be closely related to density and duration of habitation (Costin, 1986:271–276). This procedure is justifiable, but it introduces at least as many assumptions as does ubiquity.

WERE METAL AND SHELL OBJECTS WEALTH GOODS?

Wealth goods should be concentrated in the hands of the elite simply because they have the greatest access to valued resources such as rare materials, labor, and the technical skills required to obtain the goods. Tables 11.7 and 11.8 show that Xauxa metals and shell were strongly concentrated in elite contexts, both before and after the Inka conquest. Historical sources consistently associate gold and silver more than copper or bronze with gift giving, ritual, and high status (e.g., Cobo, 1979: 109, 178–179, 220–221, 248–249; Cieza de León, 1986a: 145, 299-300; Cieza de Leon, 1986b: 18–19, 37–38, 51; Garcilaso de la Vega, 1961: 35, 78–80, 91, 95, 116, 123, 126, 152–153, 176, 204, 249, 314, 317–319, 328;

Table 11.7. Ubiquity of All Metals, Showing a Marked Increase in Metals in Circulation after the Inka Conquest and a Decline in Their Concentration in Elite Contexts

	Elite	Commoner	Significantly differen?	Times more in Elite	Total Wankas
Wanka II	6.6%(27)	1.6%(4)	yes, $p = .003$	4.1	2.1%
Wanka III	12.7%(29)	6.0%(14)	yes, $p = .014$	2.1	6.7%
Significantly different?	yes, $p = .009$	yes, $p = .009$			
Times more in Wanka III	1.9	3.8			3.2

Note. Percentages in this and tables 11.7-18 indicate ubiquity; numbers in parentheses indicate number of loci containing metals or other named material. Significance tests are Chi-square (x^2). "Total Wankas" column assumes that the Wanka population was composed of 10% elite and 90% commoner people.

Table 11.8. Ubiquity of shell, Showing a Minor Increase in Shell in Circulation after the Inka Conquest and a Decline in Shell Concentration in Elite Contexts

	Elite	Commoner	Significantly differen?	Times more in Elite	Total Wankas
Wanka II	3.4%(14)	0.8%(2)	yes, $p = .032$	4.3	1.1%
Wanka III	3.1%(7)	1.3%(3)	too few, $p = .191$	2.4	1.5%
Significantly different?	no, $p = .812$	too few, $p = .581$			
Times more in Wanka III	0.9	1.6			1.4

Table 11.9. Ubiquity of Silver, Showing About the Same Amount in Circulation after the Inka Conquest and a Minor Decline in Silver Concentration in Elite Contexts

	Elite	Commoner	Significantly different?	Times more in Elite	Total Wankas
Wanka II	3.7%(16)	.04%(1)	yes, $p = .008$	9.3	0.7%
Wanka III	3.1%(7)	0.4%(1)	too few, $p = .030$	7.8	0.7%
Significantly different?	no, $p = .693$	too few, $p = .949$			
Times more in Wanka III	0.8	1.0			1.0

Pizarro,1986:67, 101–102). Tables 11.9 and 11.10 confirm that silver was more concentrated in elite contexts than copper or bronze in both Wanka II and Wanka III. Perhaps because there were so few examples, the pattern for lead is less clear. Table 11.11 shows that lead objects were found exclusively in elite contexts in Wanka II but were evenly distributed between commoners and elites in Wanka III. The idea that metals and shell were valued and can be treated as wealth goods is not simply an assertion; the distribution data clearly support it. Moreover, these data suggest that silver was the most valued of these wealth goods, followed by shell and then by copper or bronze. Lead is less clearly placed but probably falls at the bottom of the list.

It is conceivable that while some metal items might have served as wealth goods, others did not. Differences between metal display goods and utilitarian goods are discussed below, but Tables 11.12 and 11.18 show that in Wanka 11, even utilitarian objects such as needles were clearly concentrated in elite contexts, as is expected for wealth goods, and that metal utilitarian goods ceased to be concentrated among the elite in Wanka III, suggesting that they may have lost their role as wealth goods under the Inka.

DISPLAY AND STATUS LEGITIMATION

The technomic functions of the metal and shell objects used by the Xauxa are generally well understood. The sociotechnic functions, however, are open to some debate. One standard interpretation of wealth goods suggests that they are displayed in order to advertise and legitimate the holder's high social, economic, and/or political status (Earle, 1987b). If this were so, at least some wealth goods should have forms that could easily be displayed, and these forms should tend to be showy or elaborated. The Xauxa clearly had such items of metal and shell, both before and after the Inka conquest; the metal ones are identified as display goods in Tables 11.1, 11.2, and 11.3.

Any wealth goods, regardless of their function, are likely to be concentrated in elite contexts, simply because they are costly and elites have more of the resources needed to acquire them. But if metal display goods were used to demonstrate and legitimate high status, then they should be even more concentrated than metal utilitarian wealth goods in high-status contexts, even though the utilitarian goods might represent comparable material and labor costs. While commoners and elites might have had more nearly comparable needs for utilitarian goods in their residences, the social and political responsibilities of elites might have created additional needs for display goods about which commoners felt less strongly. Reversing the argument, if displayable objects are more concentrated in elite contexts, then regardless of the conscious motives behind that distribution, their display would have de facto signaled the bearer's high status and helped to secure whatever social benefits might accrue to that status. Tables 11.12 and 11.13 show that metal display goods were, in fact, markedly more concentrated in elite contexts than were utilitarian goods in both Wanka II and Wanka III. Unfortunately, there are no utilitarian shell goods with which to make a similar test.

Table 11.10. Ubiquity of Copper, Showing a Marked Increase in Copper in Circulation after the Inka Conquest and a Minor Decline in Copper Concentration in Elite Contexts.

			Significantly different?	Times more in Elite	Total Wankas
Wanka II	2.4%(10)	1.2%(3)	too few, $p = .255$	2.0	1.3%
Wanka III	9.6%(22)	5.2%(12)	no, $p = .067$	1.8	5.6%
Significantly different?	yes, $p = .000$	yes, $p = .011$			
Times more in Wanka III	4.0	4.3			4.3

Table 11.11. Ubiquity of Lead, Showing a Possible Increase in Lead in Circulation after the Inka Conquest and a Possible Decline in Lead Concentration in Elite Contexts

			Significantly different?	Times more in Elite	Total Wankas
Wanka II	1.2%(5)	0.0%	too few, $p = .077$	infinity	0.1%
Wanka III	0.9%(2)	0.9%(2)	too few, $p = .986$	1.0	0.9%
Significantly different?	too few, $p = .689$	too few, $p = .138$			
Times more in Wanka III	0.8	infinity			9.0

Table 11.12. Ubiquity of Metal Utilitarian Goods, Showing a Marked Increase in Metal Utilitarian Goods in Circulation after the Inka Conquest and a decline in Their Concentration in Elite Contexts

			Significantly different?	Times more in Elite	Total Wankas
Wanka II	1.5%(6)	0.4%(1)	too few, $p = .189$	3.8	0.5%
Wanka III	2.6%(6)	2.6%(6)	no, $p = .976$	1.0	2.6%
Significantly different?	too few, $p = .300$	too few, $p = .043$			
Times more in Wanka III	1.7	6.5			5.2

EXPLICIT BEARER'S RIGHTS TO STATE RESOURCES

Meyers (1985) suggested that some wealth goods might have served the Inka bureaucracy as symbols identifying the bearer as a person with certain well-defined rights, such as the right to withdraw goods from state storage facilities. This hypothesis is essentially a stronger form of the status legtimation model. Like most strong hypotheses, it leads to rigid test implications that in the case of most of the Xauxa wealth goods can be firmly rejected by the archaeological data. Specifically, if an object type served to identify a person so explicitly that the bearer had significant access to state resources, the distribution of those markers would have to have been precisely limited to people who actually warranted that access, or the system would rapidly collapse. Such qualitative status markers would be meaningless if even just a few individuals of low status could get them. As Tables 11.8 and 11.13 show, shell and metal display goods in general were not completelyrestricted to elites. Tables 11.14 and 11.15 show that the same was true of *tupu* pins and sheet disks, two of the metal forms that would seem most likely to serve as visible status markers. These goods could not have served as "bank passes" among the Xauxa, or there would have been numerous people identified as commoners by all the other criteria who nonetheless could withdraw goods from Inka storehouses.

Perhaps, on the other hand, the highly explicit symbols that Meyers envisions would have been so valuable, so few, or so rarely preserved in the archaeological record, that excavations would not be expected to find enough of them to discern their distribution. Three Wanka III metal objects were recovered that might fit the bill, all of copper or bronze. Two are cast *tupu* pins reminiscent of metalwork from Cuzco (ID 598 and 599), and one is a large disk with a pierced trapezoidal tab for suspension (ID 630). These types may have had some symbolic associations with the Inka state across much of the empire (Owen, 1986) and in the Xauxa area were suitably scarce and limited to elite contexts. Their very scarcity, however, makes it difficult to draw conclusions from the archaeological data. Even if all three objects did have the explicit role that Meyers suggests, the great bulk of the metal and shell objects did not, and most of the economy of wealth goods among the Xauxa still must be explained by other models.

CONVERTIBILITY

Meyers's (1985) hypothesis was a response to D'Altroy and Earle (1985), whose work on wealth finance suggested that some Inka wealth goods may have been readily convertible to other forms of value, such as labor service, staples, and craft goods. Meyers felt that the Inka economy was not characterized by such market-like convertibility, but rather by various distinct spheres of exchange. The fact that some metal and shell wealth goods did in fact reach commoner households, as shown in Tables 11.8, 11.13, 11.14, and 11.15, suggests that some conversion between wealth goods and resources to which commoners had access must have occurred. If the spheres of exchange were completely distinct, then the only way commoners could have acquired wealth goods is to have made some themselves. The scarcity of materials and skills needed to make wealth goods suggests that commoners would rarely have produced wealth goods on their own. If some fraction of the wealth goods in commoner contexts were manufactured by commoners, or were acquired by exchanging

Table 11.13. Ubiquity of Metal Display Goods, Showing a Slight Increase in Metal Display Goods in Circulation after the Inka Conquest and a Decline in Their Concentration in Elite Contexts

	Elite	Commoner	Significantly different?	Times more in Elite	Total Wankas
Wanka II	3.4%(14)	.04%(1)	yes, p = .011	8.5	0.7%
Wanka III	5.7%(13)	1.7%(4)	yes, p = .024	3.4	2.1%
Significantly different?	no, p = .171	too few, p = .147			
Times more in Wanka III	1.7	4.3			3.0

Table 11.14. Ubiquity of Tupus, Showing an Increase in Tupus in Circulation after the Inka Conquest and a Possible Decline in Their Concentration in Elite Contexts

	Elite	Commoner	Significantly different?	Times more in Elite	Total Wankas
Wanka II	0.7%(3)	.0.%	too few, p = .172	infinity	0.1%
Wanka III	3.1%(7)	0.98%(2)	too few, p = .087	3.4	1.1%
Significantly differen?	too few, p = .023	too few, p = .138			
Times more in Wanka III	4.4	infinity			11.0

Table 11.15. Ubiquity of Disks, showing a Slight Increase in Disks in Circulation after the Inka Conquest and a Decline in their Concentration in Elite Contexts

	Elite	Commoner	Significantly different?	Times more in Elite	Total Wankas
Wanka II	3.2%(13)	0.4%(1)	yes, p = .015	8.0	0.7%
Wanka III	3.1%(7)	0.9%(2)	too few, p = .087	3.4	1.1%
Significantly different?	no, p = .941	too few, p = .510			
Times more in Wanka III	1.0	2.3			1.6

other wealth goods manufactured by commoners, then they would represent a direct conversion of commoner labor and material resources into wealth goods. More likely, many of the wealth goods in commoner contexts would have been given to commoners by elites in return for allegiance, services, contributions of staples or craft goods, or to encourage some future form of support. Commoners could also simply have exchanged staples or labor for the objects. In any case, the transaction ultimately was a conversion between the wealth goods and some other goods or services (see Earle, 1982, 1987b).

At the same time, the concentration of wealth goods in the residences of the same elite that also enjoyed better architecture, more utilitarian and decorated ceramics, and preferred plant and animal foods suggests that the spheres of wealth exchange and exchange of other goods were not independent. Perhaps wealth goods were convertible into the other goods and services available to elites or vice versa. Alternatively, some external variable such as kinship or political connections could have permitted access to both wealth goods and other forms of value without their being convertible. It seems unlikely that such a factor could operate consistently without the financial support that implies at least broad convertibility, but that possibility cannot be ruled out.

Can convertibility of wealth goods for other goods and services be separated from the use of wealth goods to display and legitimate high socioeconomic status? Defining convertibility broadly, convertibility and status legitimation are really two sides of the same coin. The utility of wealth goods for establishing high status makes them acceptable as gifts or payment, while the utility of high status is that it presumably improves access to other resources through recognition by the state or concession by commoners of material rights to legitimate elites. To function in this way, wealth goods need neither be literally and directly convertible in the sense of currency in a marketplace, nor need they be as explicitly symbolic and specific as Meyers suggests. Wealth goods may be broadly convertible through reciprocity relationships, and may simply contribute along with many other factors to a suite of characters that cumulatively support claims to relatively more elite status and the accompanying material rights.

CONTROL OF WEALTH GOODS PRODUCTION

Granting that wealth goods had some primary utility that led people to want them, they would also have had secondary utility as objects that could be strategically promised or given away in exchange or to establish obligations, alliances, dependency relations, and so on. A person gains materially and socially by distributing wealth goods, and the most direct way to get wealth goods to distribute is to produce them or to support their production by others in exchange for control of the final product (Brumfiel and Earle, 1987).

Most metal wealth goods among the Xauxa were probably produced locally rather than being imported. Cieza de León (1986a:242) reports that numerous gold- and silversmiths worked in Hatun Xauxa at the time of the Spanish conquest. Several copper, silver, and lead deposits that could have been exploited in antiquity are within 16 to 27 walking kilometers of the major Yanamarca valley sites of Tunanmarca and Marca, although Howe and Petersen (1994) have shown that most or all of the silver was imported from more distant sources.

Table 11.16. Ubiquity of Metal Manufacturing Debris, Showing a Possible Increase in Metal Manufacturing after the Inka Conquest and a Possible Decline in its Concentration in Elite Contexts

	Elite	Commoner	Significantly different?	Times more in Elite	Total Wankas
Wanka II	1.0%(4)	0.4%(1)	too few, p = .398	2.5	0.5%
Wanka III	1.3%(3)	0.9%(2)	too few, p = .639	1.4	0.9%
Significantly different?	too few, p = .695	too few, p = .510			
Times more in Wanka III	1.3	2.3			1.8

Table 11.17. Ubiquity of Ore Minerals, Showing a Possible Increase in Ore Minerals in Residential Contexts after the Inka conquest and a Possible Increase in Their Concentration in Elite Contexts

	Elite	Commoner	Significantly different?	Times more in Elite	Total Wankas
Wanka II	0.2%(1)	0.4%(1)	too few, p = 733	0.5	0.4%
Wanka III	1.8%(4)	.09%(2)	too few, p = .399	2.0	1.0%
Significantly different?	too few, p = .038	too few, p = .510			
Times more in Wanka III	9.0	2.3			2.5

Table 11.18. Ubiquity of Needles, Showing an Increase in Needles in Circulation after the Inka Conquest and a Decline in Their Concentration in Elite Contexts

	Elite	Commoner	Significantly different?	Times more in Elite	Total Wankas
Wanka II	1.0%(4)	.04%(1)	too few, p = .398	2.5	0.5%
Wanka III	1.8%(4)	1.7%(4)	too few, p = .980	1.1	1.7%
Significantly different?	too few, p = .399	too few, p = .147			
Times more in Wanka III	1.8	4.3			3.4

The manufacturing debris and copper and lead ore minerals recovered from domestic contexts also suggest local production, since they would probably not have been traded far from their sources. UMARP excavations at the site of Pancan in 1986 (Hastorf et al., 1989) recovered copper, silver, and gold objects dating back to the beginning of the Late Intermediate Period, and *tupus,* needles, and other fragments of copper back to Middle Horizon and late Early Intermediate times, which suggests that the basic metals technology and formal types were solidly embedded in Xauxa tradition. Among the Wanka II and Wanka III metal artifacts, several object types appear to be local specialties or variants, different from other highland and coastal traditions (Owen, 1986). The crude lead *bola* weights found in the Upper Mantaro have not been reported elsewhere; the pointed tweezer form, of which five were recovered, is extremely rare outside the Mantaro; and the patterns incised on several of the tweezers and strip fragments are quite unusual in other regions. Nevertheless, UMARP did not encounter any metal-smelting or -working areas, so interpretations must be based on the assumption that metal production debris in residential contexts is an indirect indicator of access to production places or craft workers.

Who produced metal wealth goods, or under whose auspices were they produced? Among the Xauxa, the elite probably controlled at least a sizable fraction of the production of metal wealth goods. It seems unlikely that the Xauxa commoners produced many metal wealth goods themselves, at least in contexts in which they controlled the final product, simply because so few of those wealth goods remained in their hands long enough to enter the archaeological record (Table 11.7). Table 11.16 shows that metal production debris tended to be concentrated in elite contexts, although the pattern is not strong and it holds much better in Wanka II than under the Inka. The distribution of ore minerals shown in Table 11.17 is even more equivocal, possibly because of the small sample size, or because the minerals had other uses not directly related to the wealth economy. Another interpretation of the relatively slight concentration of production debris in elite contexts is that both elites and commoners may have had some access to metal production processes. Elite access would have related to support and control of the work and final product, while commoner access would have been at the level of craftspeople who surrendered their products in return for other material support or to fulfill social obligations. In any case, metal wealth items were almost certainly produced by ethnic Xauxas in Wanka II, and what evidence there is for Xauxa production activities continued and even increased slightly in Wanka III.

Although the Xauxa apparently continued to produce metal wealth goods in Wanka 111, the Inka probably controlled a good deal of metal production in the Mantaro as well. The evidence in Tables 11.7, 11.10, 11.11, and 11.16 shows simply that the overall ubiquity of metals, particularly copper and lead, not only rose dramatically but also rose almost twice as much as the ubiquity of production debris in Xauxa contexts. The additional metals unaccounted for by increased production debris in Xauxa contexts were probably produced under Inka control. There is convincing evidence for analogous Inka control of Cuzco-style ceramic production (D'Altroy and Bishop, 1990) and good documentary evidence for state control of at least some fine textile production (Moore, 1958, Murra, 1962).

D'Altroy and Earle (1985) argued that the Inka state brought with it an increased emphasis on wealth goods in the political economy, and the dramatic increase in metal wealth goods in Wanka III (Table 11.7) tends to support their suggestion. The jump in metal production is even more striking when expressed in mass density, which should be a better measure of bulk material than ubiquity. Tables 11.19 and 11.20 show the dramatic increases from Wanka II to Wanka III in grams of copper and lead per corrected cubic meter of soil excavated; the estimate for copper among the Xauxa as a whole increased over eight times, and the mass density of lead multiplied almost forty times. The ubiquity and mass density of silver (Tables 11.9 and 11.21) did not increase after the Inka conquest; the special case of silver will be discussed later. Regardless of how the metals are divided or measured, the discrepancy between the large increase in production and the smaller increase in the production debris in Xauxa residences suggests that much of the additional production was under Inka, not Xauxa, control.

The increase in copper in Wanka III deposits can securely be attributed to increased production as opposed to accumulation and curation from earlier phases, because Wanka III copper objects are uniquely marked by their tin content. Of 10 Wanka II finished copper objects analyzed, none contained significant tin, while 9 of the 10 Wanka III finished "copper" objects qualified as bronzes, with over 1% tin. At least 90% of the copper objects in Wanka III contexts, then, were alloyed and forged, if not originally smelted, in Inka times. If the apparent increase in circulating copper really included a substantial carryover of pre-Inka copper, then virtually all of that old copper must have been melted down, alloyed with tin, and forged anew into objects of essentially the same type as before. Such wholesale reworking seems unlikely. If it was a widespread practice, the magnitude of the increase in metal wealth goods used under the Inka would have been less than the data suggest.

In addition to the finished copper objects, all the copper chunks, casting waste, or ingots were also analyzed for chemical composition. Not surprisingly, none of the Wanka II examples contained tin. However, all but one of the Wanka III pieces were also free of tin. These analyses are strong evidence that tin circulated separately from copper and was not alloyed with copper until a smith prepared to cast a forging blank or a finished piece.

Tin was not available locally; it had to be imported from far to the south (Lechtman, 1976; but also see Petersen, 1960). Although the Xauxa might have retained access to their traditional local sources of copper, they would have depended upon long-distance exchange for the tin that evidently became a necessary part of copper wealth goods production in Wanka III. The Inka are well known for having controlled travel and long-distance exchange, so Xauxa elites probably became dependent upon Inka approval for the tin they needed to produce their own bronze wealth goods. The Inka strategy for controlling copper wealth goods production, then, seems to have been to set up their own production facilities, while allowing local production to continue under indirect control by monopolizing the key ingredient, tin (see Earle, Chapter 12, this volume).

Howe and Petersen (1994) have recently shown that much or all of the recovered silver was imported from sources far from Xauxa territory. This silver presumably reached the Upper Mantaro through long-distance exchange, which the Inka could almost certainly have controlled. While probably locally produced copper and lead became far more common in Wanka III, the overall ubiquity of silver did not rise at all under the Inka (Tables 11.9, 11.10, and 11.11). The Inka claimed specific political and sacred rights to silver as a material (e.g., Cieza de Leon, 1986b:338; Garcilaso de la Vega, 1961:91,204), but the data suggest that the Inka did not extract silver from the nonproducing Yanamarca Xauxa. In fact, since the amount of silver in circulation did not decline, the Inka evidently either failed to control traditional Xauxa channels for acquiring silver or more characteristically, took over the redistribution role without reducing the total flow of silver to local elites.

Table 11.19. Grams of Copper per Corrected Cubic Meter Excavated, Showing a Dramatic Increase in Copper in Circulation after the Inka Conquest and a Decrease in Copper Concentration in Elite Contexts

	Elite gm/m³	Commoner gm/m³	Times more in Elite	Total Wankas
Wanka II	1.5 (70.2/46.8)	0.2 (6.6/35.7)	7.5	0.3
Wanka III	3.9 (116.7/30.3)	2.4 (53.0/21.7)	1.6	2.6
Times more in Wanka III	2.6	12.0		8.7

Note. Figures indicate grams per corrected cubic meter; numbers in parentheses indicate the total mass recovered over the total corrected volume excavated.

Table 11.20. Grams of Lead per Corrected Cubic Meter Excavated, Showing a Dramatic Increase in Lead in Circulation after the Inka Conquest and a Decrease in Lead Concentration in Elite Contexts

	Elite gm/m³	Commoner gm/m³	Times more in Elite	Total Wankas
Wanka II	2.4 (113.3/46.8)	0	infinity	0.2
Wanka III	5.8 (175.8/30.3)	7.8 (169.2/21.7)	0.7	7.6
Times more in Wanka III	2.4	infinity		38.0

Note. Figures indicate grams per corrected cubic meter; numbers in parentheses indicate the total mass recovered over the total corrected volume excavated.

Table 11.21. Grams of Silver per Corrected Cubic Meter Excavated, Showing a Possible Decline in Silver in Circulation after the Inka Conquest and a Decrease in Silver Concentration in Elite Contexts

	Elite gm/m3	Commoner gm/m³	Times more in Elite	Total Wankas
Wanka II	2.2 (102.8/46.8)	0.05 (1.7/35.7)	44.0	0.3
Wanka III	0.1 (3.6/30.3)	0.2 (4.2/21.7)	0.5	0.2
Times more in Wanka III	0.05	4.0		0.7

Note. Figures indicate grams per corrected cubic meter; numbers in parentheses indicate the total mass recovered over the total corrected volume excavated.

The material for shell wealth goods was clearly imported, mostly from the Pacific coast, but also probably from the eastern slopes of the Andes in the case of the land-snail shell. UMARP did not recover direct evidence of shell working. In any case, it seems likely that the value of shell goods rested more on their material than on their rudimentary workmanship.

THE FLOW OF WEALTH GOODS

Before the Inka, metal and shell wealth goods apparently circulatedprimarily among the Xauxa elite. In every metal and shell category, wealth goods were markedly concentrated in elite categories. Some wealth goods found their way into commoner contexts, presumably as payments or rewards, and, undoubtedly occasional wealth goods were given to elites by commoners in explicit or implicit exchange for goods or the services that influential individuals might be able to provide.

With the Inka conquest, however, there were a number of distinct changes in the flow of wealth goods. As discussed earlier, the quantity of copper and lead in circulation increased dramatically (Tables 11.10 and 11.11). This increase might indicate either an increased emphasis on wealth goods in exchange, as D'Altroy and Earle (1985) suggested, or a debasement of these goods as stores of value and media of exchange. In fact, parallel to the increase in quantity of metal goods, there was a pronounced democratization of access to every category of metal and shell wealth goods. From silver to shell to tupu pins, wealth goods became less concentrated in elite contexts under the Inka. While the metal display goods in Table 11.13 lost half of their status association, Tables 11.12 and 11.18 show that utilitarian goods in general, and needles specifically, became essentially equally distributed among commoners and elites under the Inka.

This democratization is even more dramatic when expressed in terms of mass density in Tables 11.19, 11.20, and 11.21, which show the bulk material in circulation. Copper as a bulk material retained some concentration in elite contexts, but the balance of mass density of silver and lead actually shifted to favor commoners in Wanka III.

The elite under the Inka still had more metal and shell wealth goods than the commoners, but the status differences, or the role that metal and shell played in defining and displaying those differences, clearly declined under Inka rule. The boom in copper production, which benefited commoners as well as elites, may have resulted in the debasement of the value of copper as a status marker. This explanation, however, does not explain the reduced stratification in access to shell, which became only slightly more common in Wanka III (Table 11.4), nor the slight democratization of access to silver, the availability of which remained constant or even fell somewhat under the Inka. It is possible that the degree of real socioeconomic stratification declined under the Inka, as suggested by many of the studies in this volume. It may also be that this pattern is caused by one or more of the potential weaknesses of the status category distinction, such as the unequal representation of different sites or the possible lack of highest-status contexts in the Wanka III sample.

The Xauxa wealth economy expanded under the Inka not only in the volume of goods involved but also in the number of channels through which wealth goods flowed. In Wanka

II, wealth goods must have moved in relatively narrow elite circles, with some minor involvement of commoners. Apparently the participation of commoners in the movement of wealth goods, or what had formerly been wealth goods if the debasement interpretation is correct, increased dramatically under the Inka. But in addition to the added participation from below, the Inka state itself became involved in wealth goods circulation from above. As discussed earlier, the Inka apparently controlled production of a significant fraction of the copper, and with the state control of long-distance travel, the Inka would also have controlled the importation of silver, tin, and shell. Such control would have been established so that the state could dole out the controlled goods, or at least influence the Xauxa who redistributed them, to advance its own ends.

MANIPULATIONS OF WEALTH ECONOMY PARAMETERS

By controlling production and distribution of wealth goods, both the Xauxa and Inka apparently used the wealth economy to their own ends. The Inka state did not simply co-opt the existing system, however; the Inka also actively manipulated the ground rules of the wealth economy, and the Xauxa seemingly did their best to respond in kind. Simply grafting the additional exchange and redistribution channels of the imperial bureaucracy onto the traditional Xauxa wealth goods network was a basic alteration to the parameters of the wealth economy.

In what was probably a more calculated move, the Inka changed the parameters of the wealth economy by introducing new symbolic referents to which Xauxa producers did not have direct access. Costin and Earle (1989) discuss the shift in ceramic wealth goods from locally produced fancy ceramics to Cuzco-style ceramics made only in central workshops controlled by the state. They note a similar tactic in metal wealth goods, with the introduction of tin bronze and, possibly, the bronze casting style of Cuzco (see also Costin et al., 1989).

It is not immediately obvious why tin bronze was so rapidly and completely adopted by the Xauxa. Lechtman (1979) has suggested that the color of bronze might have been important, although the color difference between copper and the low-tin bronzes of the Mantaro would not have been pronounced. Tin bronze is easier to cast and forge than plain copper, and the final product is harder, so smiths or users of the objects may have preferred bronze goods for practical reasons. In any case, once tin bronze replaced copper as a wealth good, the Inka could control not only their own producers but also the local Xauxa producers, who would have depended upon Inka favor to secure imported tin.

In addition to tin bronze, the Inka introduced a new technology or style of bronze casting. Copper assemblages from Inka contexts in the Cuzco area and Machu Picchu are notable for a finely crafted, restrained style of casting, probably executed using the lost wax method. All four examples of this type of copperwork recovered by UMARP date to Wanka III. The objects include two spherical bronze *bola* weights virtually identical to *bolas* from Machu Picchu (Bingham, 1930; Mathewson, 1915; Rutledge and Gordon, 1987), a *tupu* with an anthropomorphic figure as the head, and a llama-headed *tupu* very similar to *tupus* found in various Cuzco-area Inka contexts (e.g., Mathewson, 1915; Baessler, 1906). In contrast, all the objects from Wanka II contexts appear to have been forged, not cast. The cast objects in this new style could have been imported from the Cuzco area. As imports from the imperial capital, in a clearly identifiable Inka style, these objects could have been effective symbols of sociopolitical status. Alternatively, the cast objects may have been locally produced, possibly by imported smiths, using a new technology and style associated with the empire. In either case, the cast objects suggest that the Inka state had inserted itself as a new and presumably ultimate source of power and symbols in the wealth economy of the Xauxa.

The Xauxa elite would likely have resisted these attempts to erode their independence. Faced with a scarcity of silver and the competition of comparatively elaborate cast bronze goods in the state style, the Xauxa produced sheet disks of copper and their first metal objects decorated with a style of incised geometric designs that may be indigenous, or if anything, allude more to the central coast than the south-central highlands (Figure 11.2). The Xauxa elite participated in the Inka administrative hierarchy and benefited from their access to imperial symbols but also seem to have searched for ways to augment the wealth items they received from above with new display goods more directly under their own control.

Developing new formal types of copperwork would have been particularly important for the Xauxa elite, since the value of copper as a material seems to have declined in Wanka III. It might even be that one goal of the Inka expansion of copper production was precisely to devalue locally controlled copper as a wealth good. Certain forms such as *tupus* partially resisted this devaluation despite their increasingly plebeian material, so it should not be surprising that the ubiquity of *tupus* increased even more than did copper in general (Tables 11.10 and 11.14). Focusing production on valuable forms such as *tupus* would have been a way for Xauxa elites to maximize returns on copper objects as the material itself comprised less and less of the artifact's value. Introducing an entirely new, labor-intensive type of decoration such as the incised designs would have been another means to the same end.

CONCLUSIONS

Analyses of data such as these are rarely conclusive, but the metal and shell objects do support reconstructions of some aspects of the Xauxa wealth economy that otherwise would be purely speculative or assumed. Shell and metal objects were for the most part wealth goods as defined here, with silver having the highest relative value, followed by shell, copper, and finally lead. Some wealth goods had utilitarian functions, while the more valued wealth goods were probably worn as part of a suite of visible characteristics that helped to identify individuals of high socioeconomic status and to legitimate their status and claims to material rights. Wealth goods were probably exchanged in ways that effected conversions between wealth goods and staples, services, or craft goods. With a few possible exceptions, wealth goods did not function as explicit, specific badges of rank.

In Wanka II, Xauxa elites controlled most of the wealth goods, and the channels through which wealth goods circulated were relatively restricted. After conquering the region, the Inka superimposed their wealth economy on that of the Xauxa, demanding wealth goods as tribute, payments, or gifts, and redistributing many of them back down the organizational hierarchy. The Xauxa continued to produce wealth goods both for themselves and for the state, but the Inka set up production facilities of their own to augment their incoming supply of wealth goods for redistribution. Between the increases in Xauxa production of metal wealth goods, perhaps facilitated by the Inka regional peace, and the production financed by the Inka, the quantity of copper-based items in circulation skyrocketed. Under the Inka, access to all types of wealth goods was democratized across the board for the conquered people, while the network of exchanges of wealth goods expanded downward to include more movement between elites and commoners, and upwards to include exchange between elites and officials or institutions of the Inka state.

In one sense, the Inka expanded the role of wealth goods in the economy of the region by expanding the supply, while in another, they merely manipulated the system to the state's advantage by distributing quantities of bronze wealth goods and allowing Xauxa production to increase until the material lost much of its value as a wealth good. The Inka probably regulated long-distance exchange across their territory and along their roads. Tin was easily controlled because it was imported from far to the south, and control of tin meant in turn indirect control of local Xauxa production of bronze wealth goods. The exchange of silver and shell was probably controlled directly, with the state doling out silver and shell goods to local elites, but the possibility cannot be excluded that some of these wealth goods continued to reach the Xauxa elite through traditional, extraimperial channels.

In order to consolidate their control over the wealth economy and the Xauxa elite in general, the Inka managed to replace locallyproduced symbols of legitimate status with new varieties of wealth goods that had specifically imperial associations or were easily controlled by the state. Cuzco-style decorated ceramics and bronze castings were both technologically and iconographically linked to the Inka, while tin bronze, even aside from its possible ideological associations, became indispensable and was easily controlled by controlling access to tin. In the face of these new imperial status symbols and the general debasement of copper as a material for wealth goods, the Xauxa focused their coppersmithing increasingly on forms such as *tupus* that maintained some value despite the falling prestige of copper. The Xauxa countered the Cuzco style of bronze casting by introducing a new type of incised decoration on bronze wealth goods, creating a category of wealth goods more under their own control and with purely local stylistic referents.

The net effect of Inka policies in the wealth sphere was probably to extract copper from the region and to mollify the commoners with increased access to wealth goods, while simultaneously eroding the elites' independent sources of wealth goods and making them ever more dependent upon the state for their local position. Certainly these manipulations of the wealth economy would have helped the Inka to use local elites to extract staples and labor from the region, while reducing the ability of local leaders to incite and maintain a revolt. The Xauxa elite resisted to some degree the strictures of Inka rule by acquiring the more highly valued wealth goods and by emphasizing local types and decoration. The economy of wealth goods grew more expansive and complex under the Inka, but the Xauxa elite had generations of experience with the wealth game, and it is clear that they continued to play.

Acknowledgments

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Part III

Synthesis and Conclusions

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Chapter 12

Exchange and Social Stratification in the Andes The Xauxa Case

Timothy K. Earle

INTRODUCTION

To what extent does control over exchange create a basis for power in prehistoric Andean society? As discussed in the introduction to this volume, the evolution of social complexity depends partly on control. Control may come from a number of different sources of power that include the economy, the military, and the ideology (Mann, 1986; Earle, 1987a). Each society and its factions may use different sources of power, combined in different ways, but the basis of control is rooted in economic relations (Earle, 1989).

This chapter investigates how control over exchange created an important basis for the institutions of the Xauxa/Wanka chiefs and the Inka state. As discussed throughout this volume, about A.D. 1450, the Inka empire conquered the warring chiefdoms of the Mantaro Valley. Almost overnight, the lives of the Xauxa and Wanka were transformed; they were pacified, resettled out of their fortified redoubts, and integrated politically into the Inka state. How did these dramatic changes affect the economy of the Xauxa?

This chapter uses the political transformation accompanying the Xauxa/Wanka conquest and incorporation to evaluate a number of general theories that relate the organization and extent of exchange to a society's resource base and structure. It is useful to conceive of exchange as potentially fulfilling different functions. Through exchange, households can obtain goods that are needed or desired but not locally available. Through exchange, leaders and political groups can finance their activities by directing the flow of goods desired by supporters. These general functions, although not necessarily mutually exclusive (Webster, 1990), represent competing utilitarian and political theories of human economy (Brumfiel and Earle, 1987).

Utilitarian theories have a strong adaptationist underpinning. They emphasize the role of exchange in meeting household needs. For example, Service (1962) argued that exchange develops to handle local specializations that reflect environmental diversity; chiefs then arise to redistribute routinely the needed subsistence goods produced by the specialists. Substantivists such as John Murra (1975) and his many followers among Andean scholars (Alberti and Mayer, 1974; Masuda, Shimada, and Morris, 1985) believe that the social economy functioned in the pre-Hispanic period to meet the group's material wants and that the flow of goods was organized according to the social relationships of the group. Murra's

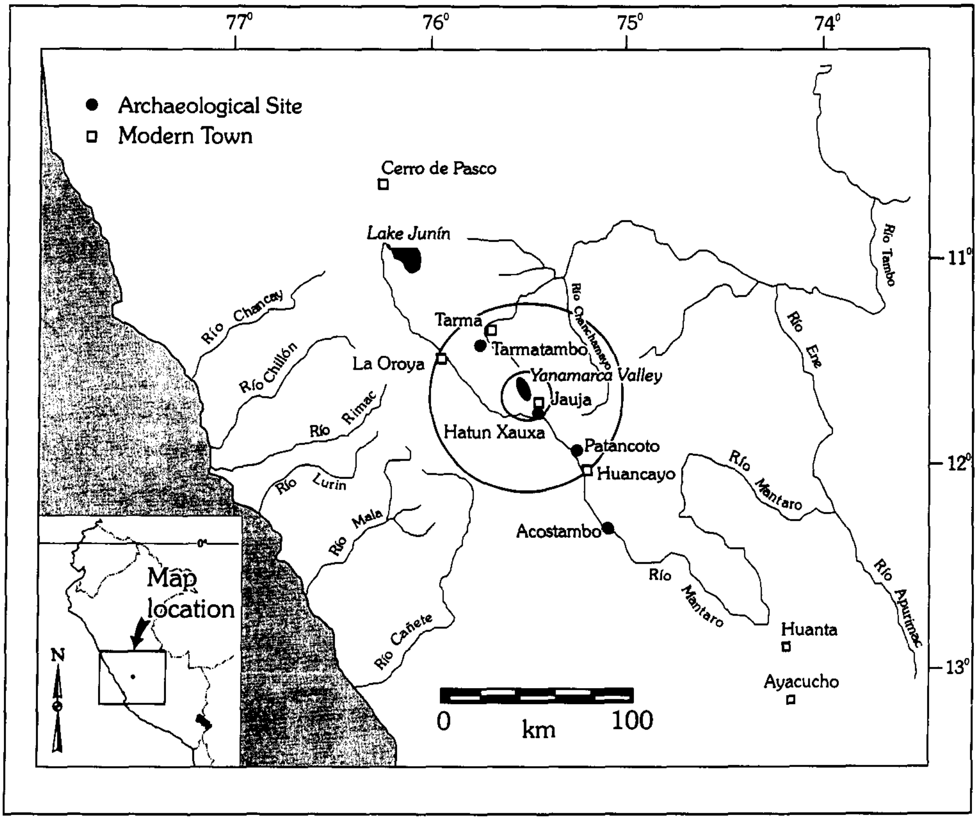

Figure 12.1. Map of central Peru, showing the catchment areas for local, regional, and long-distance exchange. Center of the catchments is the Yanamarca Valley; north is up.

(1972) vertical archipelago model postulates that the Andes are environmentally varied, with different ecological zones corresponding to changing elevation and to contrasting rainfall patterns, and that each zone would produce locally specialized goods for exchange. Formalists would add that the pattern of exchange should correspond to patterns of local production efficiencies and the costs of transportation. Utilitarian theories predict that prehistoric exchange in the ecologically diverse Andes would be quite extensive and would have increased following Inka conquest as an imposed peace increased opportunities for exchange relations.

In contrast, the political theories emphasize how competing factions and classes manipulate exchange as a means for political power. Thus, exchange should be limited especially to goods whose production and distribution could be controlled through ceremonial mobilization for feasts (Friedman and Rowlands, 1977), long-distance trade in objects of wealth (Helms, 1979), and local manufacture by attached specialists of craft and wealth goods (Brumfiel and Earle, 1987). Political theories would predict that exchange in the Andes would be controlled by political institutions and would have shifted following conquest from control by the local Xauxa chiefs to control by the Inka state. An explicitly political perspective has been little used to explain patterns of prehistoric exchange in the Andes (cf. Earle, 1985, 1987b).

THE CHANGING EXTENT AND CHARACTER OF WANKA II AND III EXCHANGE

To study archaeologically the extent of exchange, artifacts have been identified as to their likely source and classified according to zones of procurement — whether local, regional, or long-distance (Figure 12.1, Table 12.1; Earle, 1985). This simple analysis permits a summary of the extent of exchange and how it changed with Inka imperial

Table 12.1. Summary of Exchange in Various Categories of Goods

	Material	Local	Regional	Long distance
Wanka II	Plant	100	0	0
	Animal[a]	91	9	0
	Lithics	100	Trace	Trace
	Groundstone	85	15	0
	Ceramics	92	7	1
	Metals	0	100	0
	Shell	0	0	100
Wanka III	Plant[b]	80	20	0
	Animal	90	10	0
	Lithics	97	3	Trace
	Groundstone	91	9	0
	Ceramics	78	22	Trace
	Metals[c]	0	98	2
	Shell	0	0	100

[a] To make this calculation, it is assumed that deer were procured regionally.
[b] The 20% is simply a rough estimate that state mobilization represented 40% of overall food production, half of which came in from greater than 10 km.
[c] Percentage for long distance calculated estimating 32.1% coppers with 5.2% tin composition.

conquest. By considering the types of goods and the social contexts of their production and use, I discuss the probable mechanisms of exchange in each zone and how the mechanisms changed following conquest. As I now argue, the limited and highly selective nature of prehistoric exchange among the Xauxa suggests primary significance was political.

The types of goods used by the prehistoric Xauxa have been classified into three somewhat overlapping categories—subsistence produce, craft goods, and wealth. *Subsistence produce* are foods, items that must be procured and used daily for family nutrition. These include crops, domesticated animals, wild plants and animals, and beverages. Some foods, such as maize beer, are special, for example, served at feasts. While subsistence produce is typically grown by households for their own use, it may also be mobilized to support ruling institutions (D'Altroy and Earle, 1985). Subsistence goods can be expected to be generally distributed but with special goods concentrated in elite contexts because of some control over their production and distribution.

Craft goods include a variety of tools and utensils made of ceramic, stone, metal, and other materials. Employed in preparing food, serving, and manufacturing, these craft goods are used daily but procured less frequently than subsistence items. Craft items may be made of rare material, such as copper, and may be elaborated stylistically in order to carry such information as the group or class affiliation of the owner. Such craft items grade into items of wealth (see Owen, Chapter 11, this volume). Craft goods are characteristically manufactured by specialists who may act independently or be attached to elite patrons (Brumfiel and Earle, 1987). While the products of independent specialists are difficult to control and should be of broad distribution, products of attached specialists are more easily controlled and should be concentrated in elite contexts.

Wealth, prestige goods (Friedman and Rowlands, 1977) or primitive valuables (Earle, 1982), refers to items of personal adornment and display (Owen, Chapter 1 1, this volume). Although having only limited utilitarian function, they help materialize a person's social position (DeMarrais, Castillo, and Earle, 1996). Wealth is of high value because it is either made of rare raw materials or manufactured by highly skilled specialists characteristically attached to elite patrons. Its distribution is relatively easy to control, and it is expected to concentrate in elite contexts.

1 now consider how the production and distribution of these different kinds of goods are related to the three zones of procurement and how exchange changed from pre-Inka (Wanka II) to Inka (Wanka III) times. Most important will be to consider the mechanisms of exchange involved, and how these mechanisms articulate with the alternative utilitarian and political interpretations for exchange in traditional societies.

THE LOCAL PROCUREMENT ZONE (< 10 KM)

The local procurement zone is defined by a 10-km radius around a settlement. Major Xauxa settlements are separated by roughly 7 km, such that the 10-km radius means that the goods would have come either from the settlement's immediate territory or a neighboring territory. The vast bulk of all material, namely, the subsistence produce and craft goods, were procured from this local zone. The three likely mechanisms to procure goods from within the local area are direct household procurement, simple reciprocal exchange, and feasting mobilization.

Direct household procurement involves what Sahlins (1972) conceived as the Domestic Mode of Production. Each household attempts to maintain self-sufficiency by producing its own food and tools from locally available materials. To a large degree, if a household does not have direct access to a resource, it uses a locally available alternative. To some degree, the household is a basic economic unit in all societies, and household self-sufficiency is a common ideal among Andean peasantry (Johnson and Earle, 1987).

Among the Xauxa, self-sufficiency may have been quite practical. Subsistence products produced and consumed by the prehistoric Xauxa included a mixed diet from domesticated crops (tubers, maize, legumes, *quinoa)* and animals (camelids, dogs, guinea pigs) and some wild foods (especially deer) (see Hastorf, Chapter 7 and Sandefur, Chapter 8, this volume). *All* of these foods *could* have been procured locally, within 10 km of the prehistoric settlements. The food remains recovered from individual Xauxa settlements vary according to the productive potential of the 5-km catchment area surrounding the settlements (Hastorf, 1983, 1993), suggesting immediately local procurement.

The diet was generally similar across the elite and commoner sectors (Hastorf, Chapter 7 and Sandefur, Chapter 8, this volume), and changed little with Inka conquest. Some significant differences have been described, suggesting the character of local procurement and exchange. In Wanka II, when settlements were located high on the limestone ridges for defense, potatoes were especially important in the diet. In Wanka III, as settlements shifted to lower elevations, food remains, especially in commoner households, came to include more maize that could only be produced on the lower elevation soils. The desired foods—maize and meats—were concentrated in elite patio groups. Evidence for food production, including agricultural tools and butchering implements, was found broadly in Wanka II and Wanka III households.

The stone industry included such diverse items as cobble hammer stones, hoes, and many expedient chipped stone tools for cutting, scraping, and the like. The Xauxa procured their stone from local sources, especially the quarry at Pomacancha, which provided red/brown chert, and the extensive Mantaro Valley gravels, which provided cobbles of vitreous sedimentaries, volcanics, and quartzite (Figure 12.2; Russell, 1988).

The bulk of the chipped stone industry was manufactured opportunistically from these immediately available stones. Evidence further shows little change resulting from Inka conquest (Wanka II, 100% local; Wanka III,97% local). Distance to these primary sources varied according to the specific location of a settlement, and, correspondingly, the percentage of stone resource materials varied from settlement to settlement. As seen in Figure 12.3, as the distance to the Pomacancha chert quarry increased, the percentage of red/brown chert found at an individual settlement declined. This negative correlation between distance and resource use suggests an opportunistic substitution of the gravels for the quarried chert.

Direct access to most lithic materials explains the shift in resource use over time. During Wanka II, settlements on the uplands were positioned relatively close to the Pomacancha quarry and the red/brown chert was used generally for chipped stone tools. As settlement shifted to lower elevations in Wanka III, distances to the quarry increased and to the gravels declined; the percentage of red/brown chert declined (57.8–37.3%),and the use of chert became limited especially to blades. Other materials that were probably procured locally included bone and wool derived from the family herds and manufactured by households into tools and textiles. Wool production for domestic clothing, for example, is

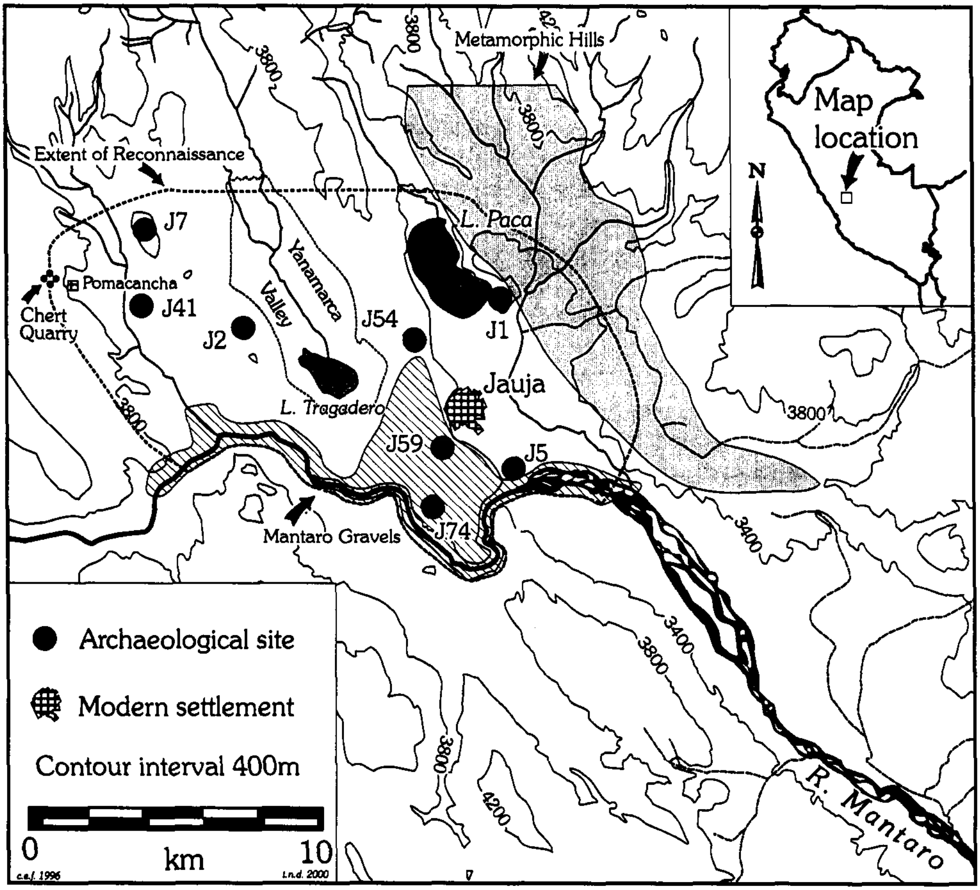

Figure 12.2. Map showing the main sources of local stone used for prehistoric tools in the Yanamarca Valley The Pomacancha chert quarry provided stone used for blades and flake tools from the western edge ofthe surveyed area Basalt, used for flake tools and hoes, came from the gravel deposits along the Mantaro River The metamorphic stone, used especially for grinding platforms, came from the hills on the eastern edge ofthe surveyed area

documented by the presence of spindle whorls in all households, indicative of local production for use (Costin, Chapter 9, this volume). A wide variety of locally available woods were also used for fuel, tools, and house construction. Interestingly, wood species varied from site to site, perhaps indicating local cultural differences or availability (Hastorf and Johannessen, 1989). Hastorf argues for the development during Wanka III of tended groves to provide the needed woods as local sources were exhausted.

Local reciprocal exchange involves the exchange between people with established social relationships (Sahlins, 1965). Such exchange tends to follow patterns of kinship and marriage, and to be most common within settlements and between neighboring settlements. Essentially, the more intimate the personal relationship, the more simple and direct the exchange relationship. Where kinship bonds do not exist, special fictive kin relationships, trade partnerships, are created. Such exchanges are common in all societies and solve problems of local resource distribution, low-level specialization, and risk (Johnson and

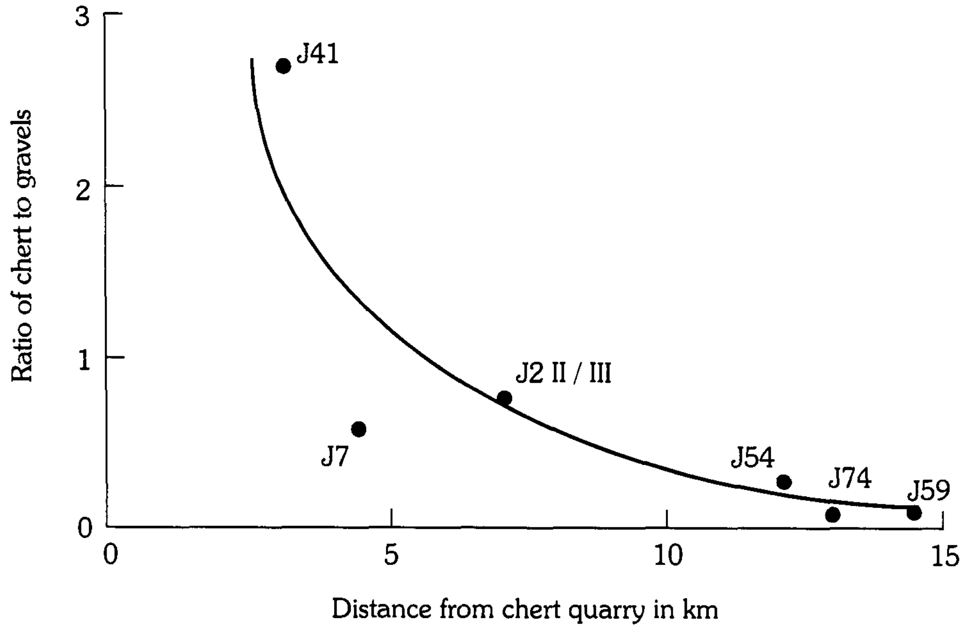

Figure 12.3. Graph illustrating the decreased use of chert on settlement sites as distance to the chert quarry increased. Expressed as the ratio between artifacts of chert and those of Mantaro gravels.

Earle, 1987). Such exchanges are decentralized and inherently difficult to control, so that they have relatively little role in the development of the political economies of chiefdoms and states. In the Andes, reciprocal exchanges were apparently responsible for exchange of labor and specialized products between households of the same community (Murra, 1972; Alberti and Mayer, 1974).

Among the Xauxa, local exchange, probably involving reciprocal relationships, was evident in specific craft industries in which raw resources were localized and necessary manufacturing skill would favor some specialization. For the localized chert, specialist manufacture of blades was located at specific villages in both Wanka II and Wanka III, from which the blades were distributed throughout the local area (Russell, 1988). In Wanka II, this pattern is documented by the blade production index (blade waste/used blades): households at Umpamalca (with an index of 2.26 blade waste pieces to each used blade) were apparently part-time specialists in blade production from the nearby Pomacancha quarry chert; in contrast, households at Tunanmarca (with an index of only 0.50 blade waste pieces to each used blade) were primarily consumers of the exchanged blades. In Wanka III, after Umpamalca was abandoned, households at Hatunmarca appear to have taken over blade manufacture; the blade production index for Hatunmarca III is 2.14; all other contemporaneous settlements have indices below 1.0. Some exchange in spun wool in Wanka II may also be indicated by variation in production (indicated by the density of spindle whorls; Costin, 1993). As elevation of settlements increased, and with it the accessibility of good grasslands for herding wool-growing llamas and alpacas, the frequency ofwhorls also increased significantly, perhaps involving local production for exchange with the residents of lower elevation settlements.

In terms of Xauxa/Wanka ceramics, most of the assemblage was locally produced (Costin, Chapter 9, this volume), decreasing from Wanka II (92% local) to Wanka III (78% local), The Xauxa/Wanka used various ceramic vessels with four characteristic wares—micaceous, local, Andesite, and lnka (Costin, Chapter 9, this volume; 1986, 1988). The micaceous ware included the ubiquitous, undecorated cooking pot. The local wares included storage jars, serving vessels, and spoons; crude brown or red designs appear on a natural or slipped light background. Both of these wares were manufactured by part-time, village-level specialists and then distributed within local polities (Costin, Chapter 9, this volume). Evidence for local manufacture of micaceous and local wares includes the distribution of manufacturing debris and local variability in the specific composition of the wares. In both periods, wasters of the local wares (Base Clara and Huanca Red) were concentrated in certain settlements that apparently specialized in pottery manufacture. (The elaborately decorated Andesite and lnka wares were, in contrast, produced and distributed on a regional scale.)

A number of local variants of both the micaceous and local wares have been recognized. For example, in Wanka II, Costin (1986, 1988) distinguished two "production groups" of the micaceous ware from the Yanamarca Valley sites. One group represented mostly examples from the neighboring sites of Tunanmarca and Umpamalca; the other group, from the site of Hatunmarca. The local wares from Umpamalca and Tunanmarca also cluster together and are partially distinguished from the Hatunmarca wares (LeBlanc, 1981; Costin, 1986).

Before the lnka conquest, the manufacture and local distribution of utilitarian vessels were separated into two zones. At that time, the Yanamarca Valley was divided into two chiefdoms, focused respectively at Tunanmarca and Hatunmarca. Local ceramic exchange thus took place within the local polities' territories. With Inka conquest, in contrast, *single* production groups are recognized respectively for the micaceous and local wares. The imposition of a regional peace and the reorganization of local chiefdoms appear to have caused some increased specialization and exchange in ceramics. As the warring chiefdoms were pacified and reorganized within a single administrative unit of the Inka state, a single local exchange system seems to have then distributed the ceramics.

Local feasting mobilization, important in many chiefdoms such as the Xauxa, involves the mobilization of subsistence goods for feasts sponsored by the chiefs. Chiefdoms were originally characterized as redistributive societies (Service, 1962), and the hosting of feasts is the common form ofthis economic institution (see, e.g., Sahlins, 1958; Johnson and Earle, 1987). Goods are mobilized from a commoner population by gifts of foods (as in the Trobriand *urigubu* payments or the Tikopian first-fruit ceremonies) and by labor contributions on chiefly fields (a traditional Andean pattern). Feasts establish the prestige of the chief, create political alliances, and legitimize his leadership position (Friedman and Rowlands, 1977). Feasting was evidently important in many societies as a means to build local corporate identities and as a competitive arena for local leaders (Hayden, 1995). Management and local mobilization of food to support feasts offered a basic means for emergent leaders to establish political ascendancy within a group. In the Andes, peasant community work teams are associated with special feasts that both reward the workers and mark the status of the local leadership. Prior to contact, local lords retained lands worked for them by community labor that produced food that chiefs could use for personal support and support of public feasting (see Moore, 1958).

Archaeological evidence of feasting mobilization and of its association with chiefly politics is always ambiguous but the concentrations of special foods remains and evidence for food preparation and serving in elite households suggest such mobilization among the Xauxa. As among other Andean people, several foods were important culturally and eaten at feasts. Maize was processed into *chicha,* a beer consumed ritually outside of normal family contexts (see Hastorf, 1990b, Chapter 7, this volume). Meat was also relatively valuable and consumed especially at ceremonial occasions; the ritual burials of llama, dog, and guinea pig suggest a special context for their consumption (Sandefur, Chapter 8, this volume).

Some of those special foods may not have been available directly to each household. In the Wanka II period, the high-elevation settlements such as Tunanmarca were frequently positioned defensively, with little lower-elevation maize land immediately available. The local populace would have procured its maize either from specially tended fields or through local exchange. The grasslands, suitable for grazing camelids, and the forest edge, suitable for deer, were moreover not uniformly distributed, so that access to these would have varied from settlement to settlement. Apparently these special foods, for which access would have been more difficult, were involved in local feasting. During Wanka II, maize (Hastorf, Chapter 7, this volume), deer, and camelids (Sandefur, Chapter 8, this volume) were more frequently recovered in elite households.

During Wanka II, burning and butchering marks on the bones record roasting rather than the more common boiling for food preparation; these bone modifications were concentrated in elite households (Sandefur, Chapter 8, this volume). Additionally, high-necked storage vessels, large serving basins, large grinding stones, and cooking pots were concentrated in elite households (Costin, Chapter 9, this volume). We believe that those forms may have functioned for the ceremonial preparation and serving of foods at feasts sponsored within elite households as means to establish their prestige (compare Brumfiel, 1987a).

In Wanka III, evidence for local elite mobilization of goods to host feasting becomes less clear. The distinction in food remains between elite and commoner households narrows. Both maize and camelids became more available to all households, reflecting in part the move in settlements to lower elevations, conducive to maize farming, and perhaps broader access to more distant localities for camelid herding. Deer meat, like that of the camelids, increased in abundance during Wanka III; this increase was comparable for both elite and commoner households, showing that elites gained no differential access to that wild resource (Sandefur, 1988a). Other evidence for feasting in elite patio groups may decline with the loss of distinctiveness in the local high-necked storage vessels and deep basins; while bone modifications indicative of more elaborate cooking continued to be associated with elite households. Overall, it would appear that elite-sponsored feasting diminished, or certainly did not increase, following the lnka conquest.

The point to emphasize is that most, if not all, food products and the bulk of stone, ceramic, and other craft materials were procured locally from available resources. That pattern was unanticipated, because the regional environmental diversity in the Andes would seem to favor exchange. Procurement and exchange of goods shows pragmatism in resource choice. Changes in diet and craft goods following lnka conquest were quite subtle, reflecting the immediately available local material to a settlement. As we now see, the pacification of the Xauxa population by the Inka increased the local specialization and distribution of ceramics, but the regional peace did *not* cause development of more regional exchange. Political involvement in local procurement and exchange was of little importance, probably indicating the difficulties of control over local production and distribution. The primary exception to this pattern was the concentration of feasting in Wanka II elite households that would have involved the mobilization and gifting of special foods at feasts. As we now discuss, following conquest, the Inka appear to have partially co-opted this feasting from local chiefs to undercut their local power base (Costin and Earle, 1989).

THE REGIONAL PROCUREMENT ZONE (10–50 KM)

The regional procurement zone defines an area between 10 and 50 km from the settlement and presupposes procurement across several local territorial boundaries. Lacking the close social and economic ties of local communities, exchange characteristically involves intermediaries and so is more impersonal. The upper limit of 50 km is set by the distribution of the ethnic Xauxa and Wanka populations through the Mantaro Valley. Goods moving within the region were apparently quite specific, and, as I will argue, exchange of these goods can be understood primarily in terms of *political motivations.* The three probable mechanisms of regional procurement and exchange were direct household procurement or simple, reciprocal exchange, staple finance, and prestige goods exchange or administered trade.

Simple, regional reciprocal exchange was probably an extension of local procurement practices. In terms of utilitarian craft goods, few items were obtained regionally. The exception was a small amount of stone used for special purposes for which substitution was difficult. Chert was occasionally traded over distances greater than 10 km, because the properties of the Pomacancha chert were well suited to blade manufacture. Under Inka domination, as settlements shifted to lower locations more distant from the quarry, the percentage of chipped stone obtained from greater than 10 km increased somewhat from a trace (Wanka II) to 2.5% (Wanka III). Phyllite, slightly metamorphized shale, was well suited for large grinding slabs. This material was procured from the metamorphic hills 8–12 km to the east of the Yanamarca and Mantaro Valleys settlements under study (Figure 12.1). No concentrated phyllite manufacturing debris was noted in our excavations, and it was probably exchanged as finished objects. Among the ground stone assemblage, phyllite constituted 15.1% in Wanka II and increased to 21.0% in Wanka III; however, the actual amount of ground stone traded regionally declined because settlement locations shifted eastward, closer to the metamorphic hills. The small amounts of red/brown chert and phyllite obtained from greater than 10 km (but not more than 15 km) could have been procured directly from the source or through simple, reciprocal exchange in ways similar to the local exchange described previously. Procurement of some tropical forest woods used for construction or special technology may also fit into this pattern of procurement (Hastorf and Johannessen, 1989).

Staple finance is an extension of the mobilization used among simpler chiefdoms to support feasts. Previously, I described how Xauxa and Wanka chiefdoms mobilized foods locally from their territories to support prestige-gaining feasts. Such feasting probably continued during Inka domination; additionally, however, Inka mobilized large amounts of foods as part of a new system of staple finance that involved the collection of food, simple cloth, and other goods to support state personnel or special state activities (Earle and D'Altroy, 1982, 1989; D'Altroy and Earle, 1985). The Inka state collected these goods by directing corvée. held the food centrally in the massive storage complexes, and used it to support state personnel, the army, and important ceremonial occasions. Morris (1982) emphasizes the ceremonial function ofthe Inka administrative centers, where the state staged large events with copious servings of *chicha.* Concentrated at the center of Huánuco Pampa were high densities of Inka aryballoid jars, probably for the preparation and storage of *chicha.*

In the Mantaro, direct evidence for the Inka mobilization has been elaborated elsewhere (Earle and D'Altroy, 1982; D'Altroy and Earle, 1985). Most dramatic are the more than 2,000 state storage silos arranged into ordered warehouse facilities on the hills above the Mantaro River. The scale of these facilities and their concentration around the administrative center of Hatun Xauxa suggests bulk staples were mobilized regionally from the area administered by the center.

Those stores supported state personnel and its army (Murra, 1980 [1956]). Additionally, the stores were used to support massive state-sponsored feasts. The enormous central plaza at Hatun Xauxa was said to hold a gathering of 100,000 people (Estete, 1917 [1532–1533]:96–97). The concentration of liquid storage vessels (for *chicha?)* at Hatun Xauxa (D'Altroy, 1981) and the maize-enriched diet of Wanka III males (Hastorf, Chapter 7, this volume), who apparently were "eatingout" for a significant proportion oftheir meals, suggest the importance of state-sponsored feasting.

The staple finance also involved the mobilization of local craft items that households were required to produce. This corvée responsibility varied from community to community according to a logic of state-supported specialization that may have increased efficiency. Costin (1993) described how, following imperial conquest, spinning increased overall, although the specific pattern of spinning was quite varied, since some communities were systematically more involved than others. She interprets this as representing community specialization of products destined for state use and distribution.

The contrast between local feasting mobilization as seen in Wanka II and the regional staple finance system of Wanka III can be interpreted as an increasing scale of staple mobilization that was engineered by the state as a means to finance its extensive regional operations. During Wanka II, feasting apparently involved the mobilization and distribution of special foods from the local population. Control by chiefs is suggested by the concentration of evidence for the feasting in elite patio groups. During Wanka III, however, the Inka state greatly increased the staple mobilization for the support of its own activities and special ceremonies used to legitimize its rule by lavishly hosting local populations.

Prestige goods exchange and *administered trade* were probably the primary mechanisms to move special craft goods and wealth through the Mantaro region. Prestige goods exchange involves the exchange of status-defining objects between elites as a means to establish political alliances and build personal prestige (Friedman and Rowlands, 1977). These exchanges characteristically represent a separate sphere of exchange carefully controlled by the elites and carried out through ceremonial events, often involving intergroup feasts with competitive displays of both food and wealth as a means to establish personal and group renown. Such exchange events characterize both Big Man and chiefly polities. The types of goods involved in prestige goods exchanges involved either items used in personal display, most appropriately worn at special events, and objects, such as drinking vessels, involved directly in the public preparation and consumption of special foods and alcoholic beverages (see Dietler, 1990). The special objects of exchange in chiefdoms were the props and technology of ceremonial events. Administered trade in states (Polanyi, 1957) represents the more broadly integrated exchanges of similar goods with the purpose of providing special objects in gifts or political payments, again used ceremonially. Both are examples of wealth finance (D'Altroy and Earle, 1985). In the Andes, gifting of wealth was very important in many social occasions to establish social relationships and personal prestige (Murra, 1962; Earle, 1987b).

In the Mantaro, the regional exchange of special craft goods and wealth clearly indicates the political character of the exchange systems both before and during Inka domination. Two classes of special craft goods (highly decorated ceramics and metal tools) document regional exchange of finished goods or raw materials. In terms of frequency, most important were the elaborately decorated Andesite and Inka ceramics. The Andesite and Inka wares included large storage and serving vessels that were elaborately decorated. The Andesite pieces were often decorated with modeled faces and tricolor painting, characteristic of the Wanka. The Inka pieces included aryballoid storage vessels in the standardized imperial style. The manufacture of these special forms evidently required extensive labor investment and skill (Hagstrum, 1986). These regional wares, with their special vessel forms, represented a fairly small percentage of ceramic assemblage that increased with the introduction of Inka ceramics (Wanka II, 7% regional; Wanka III, 22% regional).

The Andesite vessels have been described from a broad region that stretches from Huanta on the south (Lavallée, 1967) to Tarma and La Oroya on the north (Hastings, 1985). Unlike the locally produced wares, Andesite shows little stylistic variability across its wide region of distribution. Costin (1986:483–490), using detailed analysis of manufacture and materials, showed that the Andesite ceramics both from within the Yanamarca study area and from distant locations formed a single production group. Although the location of Andesite-ware manufacture has not been determined definitively, it is unlikely to have been in the Yanamarca Valley settlements. No concentrations of wasters have been recognized and the ware represents a low percentage of the overall ceramic assemblage. Based on the relative abundance of the ware, the most likely locality for manufacture was in the lower Mantaro Valley, perhaps the large Late Intermediate Period/Late Horizon (LIP/LH) settlement of Patancoto, where Andesite ware dominates (Figure 12.1). If this settlement were the manufacturing location, the special Andesite vessels from the Yanamarca were procured from a source nearly 50 km away. In Wanka II, Andesite constituted 6.9% of the assemblage, decreasing slightly to 6.4% in Wanka III.

The Inka wares were obviously found only in Wanka III contexts. In the Mantaro valley, Inka ceramics comprised 15.2% of the assemblage found broadly in Wanka III settlements but concentrated in elite contexts. Hagstrum (1986) has argued that, based on standardization and labor investment, these ceramics were most probably manufactured under close imperial supervision. Imperial involvement in the production and regional distribution of Inka ceramics is discussed by Costin (1986:491–500; 1988) and D'Altroy and Bishop (1990).

The analysis of regionally exchanged ceramics shows some important patterns. In Wanka II, the Andesite vessels (and more generally the most elaborated local vessels) were concentrated in elite patio groups (Costin, Chapter 9, this volume). In Wanka III, these elaborate Wanka vessels were no longer concentrated in elite contexts. As status markers, the decorated Wanka wares were replaced by the Inka vessels. Assuming that Inka vessels, defining status, were displayed during public events, the elites maintained access to the regional status-marking goods, but the source of these goods and their stylistic reference shifted dramatically, The horizontal exchange relations of Wanka II, in which chiefs were probably involved in reciprocal relationships with other chiefs throughout the region, were, in Wanka III, replaced by the vertical exchange relations between chiefs and the state (Costin, 1988). The power derived from the meaning in the style shifted from regional, interelite alliances to state affiliation (Costin and Earle, 1989). In both periods, these distinctive ceramics were evidently the technology for the storage, preparation, and presentation of foods (probably drink) at the special ceremonial events. The exchange in wealth for display was thus closely linked to the mobilization of staples locally that were controlled by the chiefs prior to Inka conquest and subsequently by the state.

For both Wanka II and Wanka III, metal objects of wealth were also concentrated in elite patio groups and were probably elements of wealth both as utilitarian and display forms (Owen, Chapter 11, this volume). Metal tools, manufactured from copper and lead, were regionally procured. Although these metal tools represented a small percentage (surely less than 1%) of all the tools used by the Wanka, they were probably of unusual value and carefully curated, appearing often as burial offerings. Most frequent were simple needles recovered from both time periods; during Wanka III, additional tool types included chisels, *tumi* knives, *bolas,* and axes. Although always rare, metal tools increased significantly in frequency from Wanka II (ubiquity, 0.5%) to Wanka III (ubiquity, 2.6%) (Owen, Table 11.12, this volume). The copper and lead used in these tools was most probably derived from mines in the Mantaro region to the northeast and northwest of the Yanamarca Valley, but beyond the 10-km local catchment of the Xauxa settlements under study (Figure 12.1).

Items of decorative wealth, especially objects of adornment, were made from special materials, including metal (silver, copper, and occasionally gold) and stone (turquoise, talc schist, mica, and quartz crystals). Metal items included *tupu* pins used to secure a woman's shawl and small disks sewn on clothing; stone items included beads and pendants. The raw materials for all these items are available from the broader Mantaro region but not immediately available in the locality of the settlements. Such objects are rare; they appear especially in burials or caches. Decorative metal wealth was strongly concentrated in elite patios of both time period and most probably served as status markers. Silver items were the fairly common in Wanka II and remained little changed into Wanka III; copper items increased with Inka conquest (Owen, Chapter 11, this volume), a point to which I will return. Objects of decorative wealth, beads and pendants, were occasionally made from regionally available stone such as the copper-related turquoise. Additional items include such things as the rare stone figurine, sheet mica, or quartz crystal, which probably had specific magico-religious significance. Based on geological evidence and the materials survey conducted by Russell (1988), most stone valuables derive from the metamorphic hills located to the east of the Yanamarca (Figure 12.1). Counts are too small to determine changes from Wanka II to Wanka III.

Additional wealth would of course have included the fine textiles so valued in the Andean world (Murra, 1962). Based on historical evidence, fine cloth was evidently manufactured at the Inka administrative center, Hatun Xauxa (Cieza de León, 1984:242–243),from where it would have been distributed regionally or shipped to Cuzco.

Archaeological evidence for textiles is virtually nonexistent in the highlands and little more can be said about their importance beyond evidence for spinning (Costin, Chapter 9, this volume).

With the imposition of a regional peace and the development of a major road system, the opportunities for exchange should have expanded, and utilitarian theories predict increasing exchange under these circumstances. There was, however, no general expansion of exchange in utilitarian objects. Rather, the highly selective changes in the type and amount of goods being exchanged regionally showed the strongly political motivations of the exchanges. In Wanka II, regional movement of goods involved chiefly exchanges of prestige goods, probably at ceremonies. In Wanka III, the Inka state implemented changes as part of explicit strategies of finance and control. The state instituted the regional mobilization of staples to finance itself (D'Altroy and Earle, 1985) and imposed administrative control over production and exchange of the status-defining goods for the local leadership (Costin and Earle, 1989).

THE LONG-DISTANCE PROCUREMENT ZONE (> 50 KM)

In the Mantaro, procurement from distances greater than 50 km presupposes movement across ethnic boundaries and natural regions. To realize long-distance exchange, administered trade or entrepreneurial traders are necessary. In all periods, the types ofgoods moving long distances into the Mantaro Valley are surprisingly limited in volume and restricted in character. Almost no food or craft goods come from any distance. Exchanged goods were primarily wealth objects of metal and shell. In the Andes, long-distance exchange has been best documented for tin (Lechtman, 1979) and Spondylus shell (Paulsen, 1974). As we will discuss, the character of this exchange among the Xauxa and Wanka emphasizes its political character.

Despite the fact that the tropical forest, with its rich array of fruits and special foods, is little more than 50 km to the east, no tropical environment foods were recovered in our samples. The only movement of plant resources seems to have involved limited amounts of wood (for construction?) and drugs. Charcoal from tropical trees has been identified (Hastorf and Johannessen, 1989) and may have been imported for special construction. Coca was important in Andean ritual, although high elevations prohibited it being grown locally in the Mantaro Valley. An account describes a Wanka chiefs coca fields, tended for him in the montaña about 40–50km to the east from the Yanamarca Valley (LeVine, 1979). Such procurement from a distance must have existed for this ceremonial product. Archaeological evidence of coca is rare, but two endocarps from a coca variety grown in the eastern forest zone were recovered from Wanka II elite patio groups (Hastorf, 1987).

Procurement of craft goods from long distances was remarkably limited in both periods. The only long-distance lithic exchange would seem to have been for Quispisisa obsidian, a source located approximately 150 km to the south in Huancavelica (Burger and Asaro, 1979). Obsidian has obvious desirable properties that would have made it suitable for specialized manufacturing. In Mesoamerica, its exchange and use were broadly spread through prehistory (Hirth, 1984). When we initiated UMARP, the involvement of the chiefdoms and state in obsidian trade seemed reasonable, and I anticipated a marked increase in exchange following Inka conquest either because of direct state involvement or expanding trading opportunities with imposed peace.

Obsidian was very rare in the Mantaro sites and did not increase significantly following Inka conquest. In all our excavations, we recovered only a handful of pieces, representing a trace (0.06%) of the lithic assemblage. Interestingly, many obsidian samples showed multiple hydration readings, suggesting two times of flaking on individual pieces: one of LIP/LH date, contemporary with the settlements being excavated and the other occurring earlier. These multiple dates from single pieces suggest that much of the obsidian found in late prehistoric contexts was locally scavenged from material imported into the Mantaro at an earlier date (Russell, 1988)! The extremely limited long-distance lithic exchange is counter to utilitarian expectations, and this exchange was not affected by imperial incorporation.

The long-distance exchange of ceramic vessels was also of little importance in the Yanamarca, but it follows a pattern similar to the regionally exchanged ceramics. A scattering of pieces contrast in style and composition with the Wanka ceramic inventory and have thus been classified as probably originating at some distance. In both periods, this category of goods is a very small percentage of the ceramic assemblage, decreasing from 0.5% to 0.2% following Inka conquest.

The few items identified as coming from a long distance were among the more elaborately decorated pieces, but with distinct wares and styles not associated with Wanka types. Most exotic ceramics in Wanka II have not been identified as to area of origin; a few are of the San Blas types, coming from the Junín *puna,* 50 km to the north. During Wanka III, at least one example of imperial Inka appears to have been imported to the Mantaro from Cuzco (D'Altroy and Bishop, 1990). This specialty piece was an elaborately decorated plate, obviously used in serving and display. A few Chimu sherds, imported from the north coast of Peru, were also found in elite Wanka III contexts.

Probably the most significant long-distance exchange material in the Late Horizon was tin used to alloy with copper to create a true bronze. The tin must have been imported from the distant mines of southern Peru or Bolivia. Importantly, tin was not found in the analysis of Wanka II metals but was found in all finished Wanka III coppers analyzed. With seven objects, tin represented a mean of 5.2% (range 2.0–8.0%) of the metallic composition (see Owen, Chapter 11, this volume, Tables 11.1–11.3). Lechtman's description of the Late Horizon as a "tin horizon" in metallurgy fits comfortably with the Wanka data (Costin *et al.,* 1989). Most probably the imported tin increased the working quality of the copper tools described, but the uniform, and empirewide, shift to tin alloy suggests additionally that the Inka state probably encouraged and controlled long-distance trade and distribution of the tin. By this intervention, the state would have controlled the manufacture of the metal tools.

In terms of wealth, the addition of tin to copper ornaments is a further indication of state control over the production and distribution of these valued objects. Essentially, the addition of tin to the copper tools could be explained on utilitarian grounds, but the use of the tin in the items of adornment is probable evidence that the state administered their manufacture and distribution.

Other valuables procured through long-distance exchange were the beads and pendants of shell. Shells were found in a consistent number of excavated proveniences (Wanka II, 1.1% ubiquity; Wanka III, 1.5% ubiquity). The shells come from a variety of Pacific Ocean species: most, such as *Oliva* sp., *Thais* sp., and *Spisula* sp., have a broad distribution along the Pacific coast, which is 250 km to the east (Figure 12.2); in both Wanka II and Wanka III, single pieces of Spondylus derive from coastal Ecuador, 1,500 km to the north. In two Wanka II patio groups, shell beads manufactured from the lip of a large land snail were recovered; although species identification is not possible, these probably derive from a tropical forest species, coming from the east. Importantly, despite the broad-scale integration of the empire by the Inka, exchange of the shell was constant.

The most probable mechanisms of long-distance exchange were prestige goods exchange, managed by the chiefs in Wanka II, and administered exchange, managed by the state in Wanka III, as an extension of the politically controlled exchanges described for the regional area. Both served primarily political rather than utilitarian functions. In Wanka II, the exchange in coca, special ceramics, and shell was most likely controlled by the chiefs, who could then have controlled their distribution and display to establish and maintain ascendant status. Very few craft goods were moved any distance, emphasizing the lack of a developed marketing system. With the imposed Inka peace, long-distance exchange was not affected. Among utilitarian goods, only the tin alloying suggests an increase in long-distance exchange, but this must have been handled by a state-administered trade. The imposed interregional peace of the Inka state did not increase the availability of prestige objects. With Inka conquest, only the long-distance procurement of tin (and perhaps Inka ceramics) increased, with distribution of these evidently controlled directly by the state. With Inka conquest, changes in long-distance goods found in Xauxa/Wanka settlements were highly selective, indicative of the political process involved.

CONCLUSIONS: THE EXTENT AND CHARACTER OF PREHISTORIC EXCHANGE

Counter to the expectations derived from the utilitarian models, prehistoric exchange in the late pre-Hispanic periods of the Mantaro Valley was quite limited. The Inka imposition of a far-flung peace did *not* result in the expansion of exchange on any general basis. Rather, exchange outside of the local area was largely part of chiefly and state systems of finance and legitimation. Figure 12.4 summarizes the available evidence, illustrating several striking patterns. To the left are foods (plants and animals) and crafts (lithics, ground stone, and ceramics), items of low value relative to their bulk; to the right are the higher valued tools and prestige goods of metal and shell. Not shown is how the overall volume of goods consumed by households decreased markedly from left to right; as examples from the extremes, foods were consumed daily in bulk to meet basic nutritional needs, while shell were obtained only rarely, curated for many years, and used to distinguish dress, primarily at special occasions. The most evident pattern is that the overall amount of exchange changed little from Wanka II to Wanka III. At the local level, procurement and exchange of subsistence and utilitarian goods were similar following conquest by the Inka. The imperial state did not intervene in these traditional economic spheres except for mobilization through staple finance.

Regional and long-distance exchange, limited to goods of high value exchanged in low volumes, documented similar continuity but also with selective state intervention. Although little changed in volume and ceremonial contexts of use, the specific wealth used in Wanka III shifted markedly toward items whose production and distribution could be monitored and

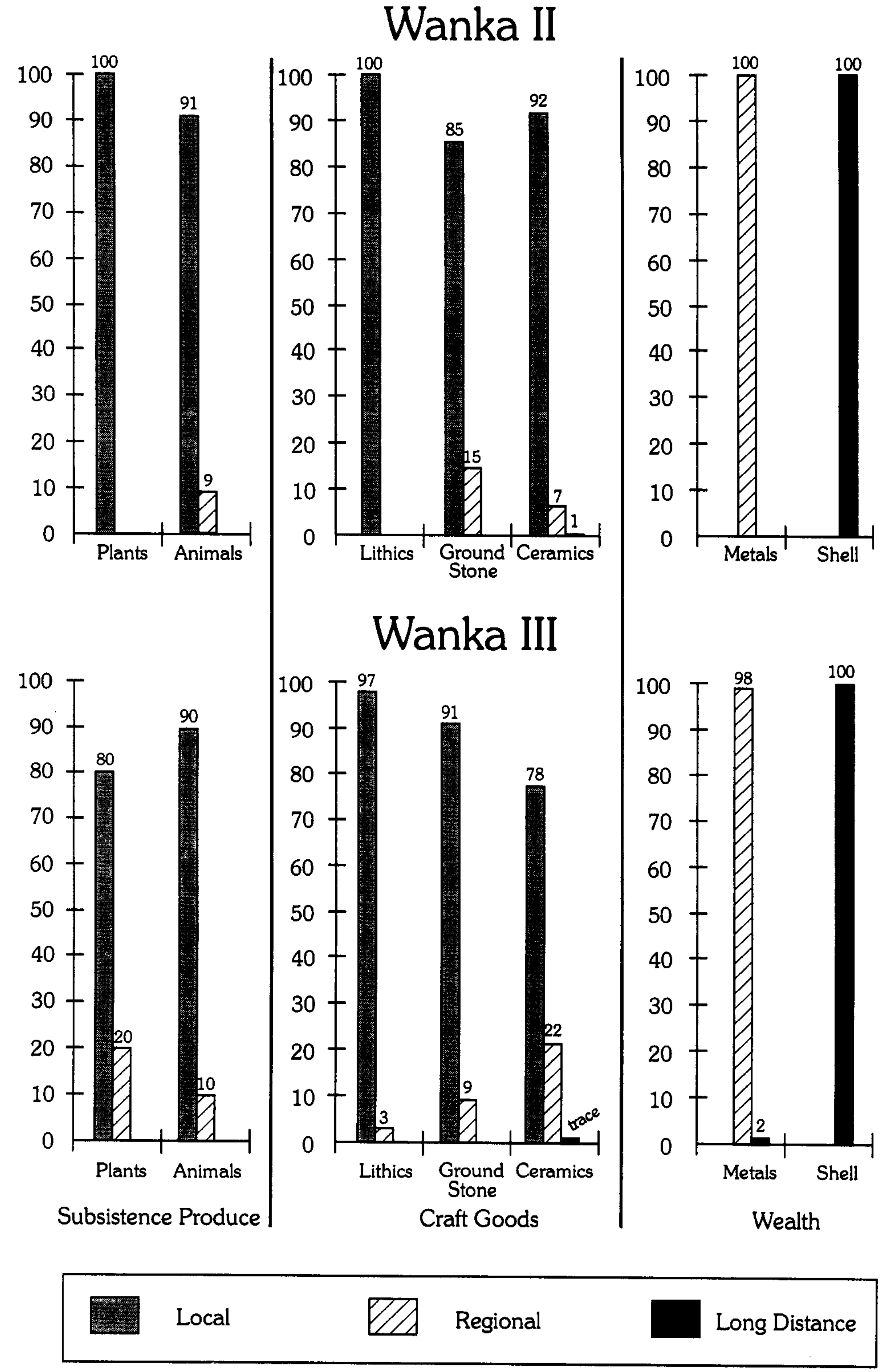

Figure 12.4. Bar chart showing the percentages of local, regional. and long-distance material in subsistence produce, craft goods, and wealth. Contrast the pattern of Wanka II exchange (above) with that of Wanka III (below).

administered by the state. Exchange had to do with political movement and gifting of controlled substances. The lack of an increase in exchange following Inka conquest emphasized how the state restricted horizontal relationships among conquered communities and emphasizes the vertical dependency of these communities on the state (Earle, 1985).

Much exchange among the Xauxa/Wanka was apparently restricted to political strategies for control and finance. In Wanka II, exchange involved the mobilization ofgoods used in feasting and the selective regional and long-distance exchange in wealth. This pattern fits a model of competitive feasting and prestige goods exchange that characterizes many chiefdoms (Friedman and Rowlands, 1977; Hayden, 1995). Emerging elites likely manipulated exchange to extend their political power through horizontal alliances with other chiefs. At least some of the goods, including gold and silver (Lechtman, 1984), and the quartz crystals, were connected to magico-religious properties and probably to esoteric knowledge (see Helms, 1979) that would also have legitimized the elites' sacred rights to rule. Certainly, the objects exchanged would have been used primarily in the ceremonial contexts, where food was mobilized and consumed by the local population.

In Wanka III, the conquest and imposition ofthe Inka imperial system demonstrated the political quality ofthe exchange. The mobilization of special foods was apparently greatly expanded and centralized by the state as part of a broad systems of staple finance, and the state became deeply involved in ceremonial production. The exchange of wealth in the prestige goods exchange was selectively transformed to emphasize the specific goods (most obviously, the metals and state ceramics) that were controlled by the state and referred to symbolically in a uniform state style, thus linking ceremonial production to the state ideology (DeMarrais *et al.,* 1996).

Although exchange in the late prehistory of the central Andes provided for utilitarian needs, it played a relatively minor role in Xauxa/Wanka domestic life. As has been concluded before, the Andes prior to the Spanish conquest was a nonmarket economy (Murra, 1980; La Lone, 1982; Earle, 1985). But it appears to have been *nonexchange* as well. The lack of exchange seems to reflect two conditions. First, the nature of the local economy was such that exchange was rarely required beyond fairly local areas. A tradition of self-sufficiency was therefore possible and characterized much of the Andes. Second, beyond this, the nature of political control and finance was based on factors probably involving warfare and the intensification of local production (D'Altroy, 1992; Hastorf, 1993). The chiefdoms of the high Andes depended on the local mobilization of food to support corporate and competitive feasting, and exchange as a mechanism of power was only secondarily attached to the feasting. The massive Inka imperial economy for finance was built largely on these established precedents, apparently for both practical and ideological reasons. The dramatic imperial transition was thus framed and finance in ways that emphasized continuity and stability. Exchange was changed only subtly to increase the selective control over very specific spheres involving the scale and control over finance and ideological representation.

Chapter 13

The Xauxa Andean Life

Christine A. Hastorf

The Upper Mantaro Archaeological Research Project's goal in this volume is to get a closer look at the workings of the Inka as well as the local Xauxa domestic economy. The Late Intermediate Period has been the study of several dissertation projects in the region (Costin, 1986; Hastorf, 1983; LeBlanc, 1981; Russell, 1988; Sandefur, 1988a: Lennstrom 1992). From those works and additional material presented in this volume, we have found that during the last pre-Inka phase, the Xauxa were like many other polities across the central Andes at the time, with indigenous, aggressive leaders, or would-be leaders, expanding economic and political influence as much as they could within their own regional settings. Not as large or complex as the Lupaqa or Qolla, nor as small in scale as the Yauyos, the Xauxa coalesced enough politically to have aggregated into a series of large, tightly contained communities within fortification walls. These kin-*ayllu*-based alliances had leaders powerful enough to organize colonies for growing warm-weather crops on the eastern slopes (LeVine, 1979), to display some evidence for special status, and to be involved in recurrent and aggressive battles with each other.

The material presented in this volume on this phase of Xauxa history is useful for us in measuring the impact of the Inka state on conquered peoples, but we can also learn a lot about Andean community life by spending a bit of time in the pre-Inka world. With the rich range of data on this region's archaeology presented here, we begin to see an autochthonous society in the throes of a dynamic and unstable political and economic life, very much like what the proto-Inka (Killke) themselves might have been doing within the Cuzco region at the same time. What can we say about the Xauxa on the eve of being swept up into the Inka empire?

HETERARCHY AND HIERARCHY AMONG THE XAUXA

The Xauxa political evidence illustrates a perfect example of heterarchy and hierarchy operating simultaneously within a society. Hierarchy is the difference in political power of a person or group within the greater whole. Such a situation is always tempered by desires and negotiations of others. Heterarchy occurs where differing parts within a society pressure and jostle sectors in a dynamic tension, creating competing but relatively balanced power relations (Brumfiel, 1995; Rowlands, 1987b). In Andean terms, this is seen in different political structuring principles that are called upon in many daily practices. These are balanced reciprocity, called*yanantin* (Platt, 1986) or *waje waje* (Fonseca Martel, 1974), between equal but different parts, and hierarchy or difference within pairs as in the Inkas sons (Schaedel, 1988). Both principles are called upon in social settings today in the Andes and probably contributed to the symbolic and political economies of the Xauxa during the Late Intermediate Period.

The Wanka II households, composed of round houses within patio walls on densely packed, fortified hilltop sites, show evidence of these differing political dynamics at play. Some aggrandizement was present, but it was neither across the board nor completely centralized or hierarchical. Evidence for difference is seen in the elites' house construction and their access to greater space within the cramped, enclosed sites, in the staple and wealth production and consumption, as well as in the political use and distribution of items of status. The sense of balance in the concept of *yanantin* is a strong moral doctrine within the Andean world even today. Although the society had elements of inequality, there was also much that counterbalanced this; for example, there is evidence that everyone ate the same diet; they had and used the same technologies and tools. They were all farmers and herders,

While summarizing the evidence we have amassed, we can now ask how strong the evidence is for inequality and how centralized was the political decision making? Because we have collected detailed data on a series of houses, we have gained information on the range and scope of the daily production and processing practices of foods and craft goods and on their use and discard. This gives a reflection of the people's activities occupying these households. With a closer look at these data, we can begin to see their world made up of actions and events.

In this study, some vistas into the past have been simplified, perhaps overly much. For example, we divide the Xauxa world into two socioeconomic statuses (elites and commoners), knowing that there were many more groups negotiating for access and position. Should we not ask if all politically and economically elevated people were the same elites that lived in large compounds? Surely, there was more than one type of elite, some politically powerful but not economically so. What about the life cycles of households and the heads of households? There must have been families that gained and lost power. As families grew and shrank, there should have been differences in their household activities and material remains that changed through time.

From the data presented in this book, it does seem likely that the political elite were also richer, and that the rich were most likely the powerful warriors or their close kin or allies. For these reasons, we will continue to use these categories as ways to see some of the dimensions of the Xauxa's daily life. How powerful were these leaders? How much capacity did they have to control others' labor, and how much of that labor? Could they appropriate labor only in their own households or could they also gain work or goods from outside? Was the labor primarily for staple production or also for wealth finance? We can now begin to address these questions that surround the domestic economy of the Late Intermediate Period Xauxa.

Dualism and balance was strong in the Wanka II/Xauxa world, seen clearly in the upper and lower districts ofthe two central sites we studied (Tunanmarca and Hatunmarca). Social identity was strongly marked on the living landscape of the towns. People would have been conscious of this dualism as they moved within and between these two *barrios* during their daily, extrahousehold movements. They would have known who came from which district within their community. Kin from the outer settlements would have been associated with one or the other sector. This "balanced" dualism in the residence districts, however, also was the locus of difference and inequality, probably with different families or *ayllus* vying to dominate the decisions made for the community (Giddens, 1979). There is evidence for rich "elites" in both sectors of the two centers, suggesting a differentiation through place, objects, and activities within the settlements. These also seemed to be spatially closer to the plaza centers, at least occasionally.

Ultimately, however, there was no single center or central leader in the Late Intermediate Period here (unlike the Lupaqa; Julien, 1983, 1993). The Xauxa or the Wanka, after all of their internal battles, did not consolidate themselves under one leader before the Inka arrived from the south. The archaeological evidence suggests that there was little centralization or specialization in economic terms, that people had not radically increased their exchange outside of the Mantaro Valley from earlier phases, and that households tended to produce their subsistence crops and animals nearby their residences. But there were clearly richer households that were embroiled in aggressive political negotiations, competing among themselves to gain or maintain status. How did they compete? What did they gain? What did this status mean on the ground?

LEADERS AND THEIR ACTIVITIES

The archaeological and historical evidence suggests that certain Xauxa families were larger due to their increased in-residence kin, more surviving or adopted children, multiple wives, and servants. All of these routes to increased numbers led to more labor per household and more activities per square meter of walled compound. Also, these larger patios were often better constructed (DeMarrais, Chapter 6, this volume), suggesting that the residents had access to extra labor at the time of their fairly rapid construction. Larger household populations fit with the need for more labor to complete an array of tasks that were more pressing with the aggregation of the population, to provide goods used in increased gift exchange and reciprocity that aided the social construction of these new communities, to herd the increased densities of camelids surrounding the settlements (Sandefur, Chapter 8, this volume), as well as to supply extra labor to ensure crop yields in this more extensively farmed upland environment with ridging, terracing, and irrigation (Hastorf, 1993). Our longitudinal population data suggest that the Wanka II population had an increased birth rate over earlier times, so not only were they more closely packed but also they most likely composed larger families than in earlier times (Hastorf, 1983). The pressures of these activities affected significantly the women, men, and children in these families. The internal hierarchies among the females would have been altered by the added tensions of the congested neighborhoods, the increased food preparation (Hastorf, 1988), the extra weaving (Costin, 1993), the lengthier transport of basic necessities, and the additional child care.

These local leaders must surely have had increased civic responsibilities, especially organizing the meetings that allocated land and water. Clear evidence for this is the very well-preserved irrigation canal system that joins all of the northern group Tunanmarca settlements together along one ditch from one *puna* spring (Hastorf, 1983). Many historians and ethnographers have noted the focus of community social organization around irrigation canals (Sherbondy, 1982; Sikkink, 1994). The Tunanmarca alliance had one interconnected canal system that watered four sites, suggesting that maintenance and allocation was overseen by a single group. Canal construction and maintenance was most likely completed by multicommunity labor *(minka).* Such larger-scale labor tasks could have been organized at the multisettlement level; thus, such reciprocal activities should have been a place for manipulation and centralization at several levels of political negotiation up to and including hundreds of households.

Today, every household must send one representative to participate in the community work days (Isbell, 1978; Sikkink, 1994). Such participation grants access to water, land, and other communal natural resources, including bedrock for houses and clay for pottery. On a smaller scale, all family members are obliged to participate in their own family's field harvests. Alterations could have occurred in which the work parties were not just working for the community but also were working for the leaders. One such slippage in the balanced obligation was documented in the 1980s in the southern Mantaro Valley by Gavin Smith (1989). There, a local leader made a plea to his neighbors and kin, saying that they were all one big family; thus, they should work on his land as if it was their own for the greater good of the "family,"since he was overseeing other needs of this large "family." He seemed to be asking for community *minka* labor but called it familial obligations, so that he would not personally have to pay anything back, thus aggrandizing himself while minimizing the quantity of reciprocal goods required.

Such a community organizer might also have been involved in other essential managerial activities at the Xauxa settlements. There were the completely new settlements themselves that had to have been constructed fairly rapidly. Though the settlements are clearly not completely preplanned, their outer double walls, with only two well-protected entrances to the site of Tunanmarca and central, interior enclosed spaces with special buildings, had to be planned and their construction orchestrated. Group *minka* labor again would have been involved and someone would have coordinated that, even if from a rotating position. In addition, groups of patios were constructed at the same time, often with adjoining walls (DeMarrais, Chapter 6, this volume), as if a kin leader had overseen that portion of the barrio construction.

Another probable avenue for leadership expansion either in a parallel power position or in the same person as the community organizer, would have been the war leader, or *zinchi.* Various documents, especially the Toledo (1940a, 1940b, 1940c) and Vega (1965) *visita* interviews written down in 1571 and 1582, respectively, in the Xauxa and Wanka regions, speak of the growth in importance of such war leaders in this Late Intermediate Period (Levine, 1979, 1985; LeBlanc, 1981; D'Altroy, 1987). These investigators were interested in learning about the pre-Inka economic and political situation. The documentary interviews focus on warfare and competition between the local groups as the nexus for building leadership. The war leaders were considered lords or captains, probably leading local battles against their neighbors as they captured booty, people, and land.

> Since there were wars among natives and towns, where there was a valiant man chosen from among them called *zinchi* meaning "now here is this valiant man," those who could not [defend themselves] took shelter with him and with the town that had wars with the other and said, "this is the valiant man who defends us from our enemies, let us obey him" and thus they obeyed him and had no other manner of government. (Toledo, 1940c: 18).

Most of the informants in these interviews commented that their ancestors went to war to acquire land—sometimes to kill the previous owners and divide up the land among the victors, and at other times to take the inhabitants as servants or slaves (Toledo, 1940c:28). The documents suggest that successful *zinchikuna* took conquered land and were responsible for organizing its apportionment as well as requiring tribute from the defeated communities. Such leaders therefore gained more access to land, labor, and specific valued goods. During this time throughout the central Andes, warfare had become an important nexus for both political and economic identity, and thus would have contributed to the rise of hierarchy. Not only did the successful people gain more goods, as will be discussed later, but they also gained access to more hands and probably land upon which to produce the essential wealth of the Andean world: food and cloth.

Warfare and battles are associated with a dualistic balance as well in the Andes (like yanantin), evident in the concept of *tinku,* which such ritual battles are called today (Alencastre and Dumezil, 1953; Hopkins, 1982). These battles are still fought to maintain a social balance, to help gain a better harvest through a successful fight with blood spilt on the ground, as well as to maintain the identities of neighboring groups. This orientation toward fighting might have been the same for these battles in the past, in part to maintain balance, to regulate order and resolve disputes in acephalous situations and unhierarchical political orders, and to (re)define boundaries. They were also fought occasionally to gain land and labor. Battles, therefore, were political, social and economic.

Why was such warfare occurring throughout the Andes? The Xauxa were not unique during this time. We know that the larger polities of the Middle Horizon had collapsed around A.D. 900–1000 and whatever political and economic integration that had been achieved within their day had dissolved. The breakup of these pan-Andean interaction spheres, as well as the growing threat from the south, all the way from the Titicaca Basin, had repercussions that tipped relations off-balance and encouraged an inner focus on local, ethnic tensions (not unlike what has happened with the breakup of the Soviet Union and the blossoming of the local ethnic identities, accompanied by heightened tensions between groups). At that time, people abandoned their valley and lower hillside homes, and moved up to live on top of windy, exposed knolls, with restricted movement, well above the warmer, maize-growing zones. There might have been aggressive internecine warfare during the early days of the Late Intermediate Period that convinced people to leave their old, conformative (and warmer) homes to move up into untypical dense city dwelling, citadels, in times of crisis. In addition, many of the small communities had to move in next door to their neighbors, thus forcing new, more intensive intra- and interkin relations. The residents clearly were worried about defense, but there is not much evidence for actual community conquest within the Xauxa territory. Rather, it seems that they were in constant competition, fighting their neighbors for their identity and balance in the world. This tension is the essence of *Andean* heterarchy.

Do we have anyjustification to link the larger, richer households that we have excavated and labeled as elite patios with either or both the community organizers and the *zinchikuna?* Would such leaders be rich in kin and good? While we cannot firmly answer this, there seems to be some support for this association in the historical descriptions of Xauxa war leaders' activities and access. A small percentage of the population had an increased amount of valued things within the home. These same houses also evidence more labor investments put toward feasts and public display, the essential actions that create group solidarity in the

Andes. At this point in the analysis, both of these material correlates for heightened activities are within our elite classification.

THE DOMESTIC ECONOMY

When we turn to the archaeological record that UMARP excavated and reports on here to learn about these elites, these leaders, we learn that the rich, "elite" families that might have held one or several of these political or war leader positions simply worked harder at the domestic tasks, had more wealth goods, and also hosted more feasts then their neighbors with more humble homes. The chapters in this volume strongly show that the larger families seemed to perpetuate their positions through displays of generosity and feasts that took place within their own homes, including giving food (especially roasted deer and camelid meat) and drink *(chicha,* i.e., maize beer) to others, as well as possibly giving away cloth, ceramics, captured items, and metal ornaments (Owen, Chapter 11, this volume). Such behavior is supported in the historic documents as well as in ethnographies of Andean economic–politicalcommunity relations (Allen, 1988). These richer people lived in larger patios with more circular structures (DeMarrais, Chapter 6, this volume), and they left more (denser) artifacts on their floors in general, suggesting that they just plain worked harder (Hastorf, 1993:93). This activity is evident in the data associated with a series of activities such as spinning and weaving (Costin *et al.,* 1989). There are more liquid containers in these larger patios, more southern Mantaro Valley Andesite vessels (reflecting regional exchange; Costin, Chapter 9 and Earle, Chapter 12, this volume), more roasted and butchered meaty bones (Sandefur, Chapter 8, this volume), and more maize and evidence of its preparation (Hastorf, Chapter 7, this volume). As Sandefur points out, roasting is more costly in terms of fuel in this environment than boiling food, and so with more evidence for roasting in the elite houses, we get a subtle sense of the interest that these richer families had in stylistic gestures of waste and magnanimity at their in-house feasts. As noted for this Wanka II time, there is also evidence for fuel exhaustion of wood across these sites; therefore, fuel must have been a major, ongoing problem, especially in dense and crowded settlements (Hastorf and Johannessen, 1991).

There is a concentration of wealth items in the elite patios: more silver, arsenical copper, and shell (both eastern slope land snails and marine shell) made into decorative ornaments or small tools (Owen, Chapter 1 1, this volume). These more obvious wealth items contained some elements from afar (marine shell), although the production of these ornaments was most likely locally done, despite the lack of evidence for processing these specific items on the sites we studied. Tools still were predominantly made from bone and wood. The metal tools are small, mainly items such as pins *(tupus)* for women's shawls. Interestingly, when it comes to the most overtly political wealth items such as metal, the nonelites, or "commoners,"did have some metal, but they tended to have much less and of different sorts, mainly lead.

Almost more interesting in the Wanka II phase, however, is the evidence for leveling among households. Residents of the richer households also completed the tasks required for daily life, like everyone else in their communities, such as maintaining their own tools for farming their fields, caring for and consuming their herds, and preparing and cooking their food, which consisted mainly of boiling their meals in stews (Costin, Chapter 9; Hastorf, Chapter 7; and Sandefur, Chapter 8, this volume). These richer, larger, and perhaps more politically powerful families basically maintained their own households just like everyone else. These richer, elite (would-be) leaders were not so specialized that they had people from outside maintain their homes. Such is not the picture in other Andean societies, like the Lupaqa in the Titicaca Basin (Hyslop, 1976; Julien, 1985:216; Murra, 1972), the specialist metal producers at Chan Chan (Topic, 1982), the elites at Tiwanaku (Janusek, 1994; Kolata, 1993), or those at Wari (Brewster-Wray, 1990). There, the elites were mainly consumers and did not process their own productive tools and foodstuffs. We see that every household in Wanka II times completed the full range of domestic tasks within the domestic economy.

The items that we know about from the excavations provide a blended picture of the domestic and political economies. Clearly, the domestic production within these families' fields and patio areas of was not solely for political maintenance or gain but primarily for daily existence. The same is seen in the other patio groups we excavated. Those smaller, less well-endowed households also have all of the evidence for daily maintenance tasks: cooking, mainly boiling food; chipping stone; making wooden tools; collecting wood and dung for fires; spinning; storing food in unused structures; and so on. Basically all Xauxa households performed the same tasks. For example, very little obsidian is found at the sites in the region, and it turns out that much of it had been brought into the area before Wanka II times. During that time, the already small fragments were retouched and reused throughout all patios, and there was not an increase in long-distance trade of items (Earle, Chapter 12, this volume).

While the scale of the political and the domestic economy was quite low level, there was some specialization at the alliance level. From the detailed ceramic analyses of Catherine LeBlanc (Scott) and Cathy Costin, we learned first of the different local ceramic frequencies between the two alliances we investigated: the Hatunmarca, J8 and J42, in one sphere, and the Tunanmarca cluster of sites in the other. Within the northern Tunanmarca group, we also know that production of some ceramics tended to occur at Umpamalca, as did the preparation of good-quality red chert blades, whose raw material was mined from the Pomacancha quarry, north of Umpamalca (Russell, 1988). These specialists do not seem in any way to be attached to the rich and/or the leaders, but seem to have been unattached, making or preparing their goods in the off-season, exchanging and distributing their wares to kin and alliance comrades (Costin *et al.,* 1989; Hagstrum, 1989). While we know that weaving occurred in every patio, the richer patios have evidence for more spinning and weaving. Also, the communities located nearer the pasture lands show evidence of more cloth production, supporting some spatial specialization within an alliance. These higher-elevation communities therefore found themselves exchanging goods with their lower-elevation allies for basic products.

The domestic economy evidence does not exactly support the ideal vertical economy envisioned by Murra, but it does suggest an element of environmental specialization even in this relatively decentralized economy. For me, this small intraregional level of specialization seems essential in such a diverse environment and should not be seen as a true elaboration within a domestic economy. Overall, the Xauxa people during the Late Intermediate Period were actually quite locally based and self-sufficient (Earle, Chapter 12, this volume; Hastorf, 1993). Our household data suggest that the Wanka II people lived most of their lives within 5 kilometers of their home.

FINANCE FOR THE WANKA II PEOPLE

On top of their basic subsistence, the richer elites expended extra per-household energy on symbolic wealth items such as metals and cloth (Costin, Chapter 9 and Owen, Chapter 11, this volume), to use, display, and perhaps share with allies and kin, and to help them organize and participate in regional *tinku* and "fierce fighting" (Platt, 1986; Hastorf, 1993). Equally important was channeling their own and other's household labor into staple finance. By not only processing (and perhaps producing) and consuming more food, but also preparing and serving more special, highly valued foods, the elite patio groups had 20% denser meat-bearing bones than the commoner patios (Sandefur, Chapter 8, this volume). Of course, these meats could have been prepared solely for the family and labor exchange meals *(ayni),* but it is likely that these special meals were also for more politically directed feasts.

Of note in relation to the staple finance evidence that we see in Wanka II times is the lack of obvious storage areas or facilities related to extra production by the elites. There is little evidence for centralized storage except perhaps in the unexcavated, large rectangular structures associated with the central plazas, but it is unlikely that these would have been used by individual families. Within the larger elite patio compounds, there are, of course, more structures and some of these were probably cycled into storage use. But such storage areas are not like the Inka storage structures that we see built in the next phase, which were spatially separated from dwellings.

The leaders not only would have had more people around them in their homes, but they also would have had to host more meetings and feasts. The members of such leading families would have had to work harder than the average family at these settlements, for example, preparing food for alliance-building feasts. While every member of the family would have worked harder on aspects of these projects, the burden of many of these tasks, especially on a daily basis, would have been on the women of the family. As Costin (1993) has forcefully noted in her work on weaving, the women were probably the spinners and weavers, with the elites having twice as much evidence for this activity within their houses. They surely also stored, processed, and prepared food (Hastorf, 1991). Males in the family would have been involved in more sporadic labor, such as metal processing, trading, and herding. The men would also have been recruited into military battles by the *zinchikuna,* as well as protecting and maintaining the fortifications of the settlements. We see that both male and female labor would have been more pressured under these circumstances, forcing the females of the house to schedule the household tasks more carefully, and perhaps even encouraging both males and females to remain in their households longer before starting new abodes than they had done previously.

Most of the activities for which we have direct Wanka II archaeological evidence are within the staple finance domain of the economy; some activities, however, were also part of the political or wealth finance domain, most obviously trade items. Elites would have traveled to exchange for the more distant items such as the higher-quality vessels, such as Andesite jars, that seem to have been made in the southern Mantaro Valley. These high-quality jars occur in markedly higher densities in elite patios (Costin, Chapter 9, this volume). Although exchange or movement of goods was not common in the Late Intermediate Period record, these Andesite trade ceramics have been found throughout the intermontane region (Earle, Chapter 12, this volume). There is evidence also that maize was more common in the elite quarters, and this, too, would have been brought onto the settlements, since the Wanka II Xauxa sites had almost no maize-producing land nearby (Hastorf, 1993).

Elite persons were probably always vulnerable and unstable. New leaders could have arisen from any faction within the settlements, since protection and fighting were part of the basis for power and community support. The leaders were allowed special accumulations of goods, but were not allowed to expand very far. We assume that the evidence for differences is reflected in prestige goods (Hastorf, 1993:93).

CONCLUSIONS

Looking at Wanka II/Xauxa life, one gets a glimpse of kin-based groups in fairly tumultuous times. They look much like the midrange Lupaqa sites that Hyslop (1976) and Stanish (1992) have recorded in the southwestern Titicaca Basin, such as Pukara Juli, composed of dense patios with some small "igloo"*chullpa* (burial chambers) on top of hills. While the Xauxa were feuding among themselves in typical small-scale societal fashion, they were also showing signs of constant social negotiations that surround active political escalation. Such key activities can take place within any part of society, but for the Xauxa, it centered on the domestic economy, with a focus on maintaining and gaining land and labor, on the symbolic show in food preparation and feasting, on cloth weaving and spinning, on the threat and physical power of war leaders and battles. Through the artifactual data, the Xauxa have shown us their world of interactions, successes, and failures. We learn not only what they valued but also what placed constraints on their lives, especially the threat of attack in Late Intermediate times. Due to these external and internal changes, the populace decided to move into redoubts, away from their lineage lands, and refocus their production toward tubers and camelids. They had to adjust their activities to include restriction of movement, constant protection or attack, probably losing loved ones more quickly than in the previous times. What they did not seem to escalate was long-distance, interzonal trade. Such trade was more common in the Late Intermediate Period Estuquiña Phase in the eastern Otora Valley of southern Peru, where many Xauxa traits are seen in the archaeology (Stanish, 1992:157, 162). The Xauxa are not like these south Andean ethnicities, in that I do not think their economic core was long-distance exchange. While they did participate in local exchange, for example, the wool produced in the *puna* sites, they were not involved in a major pan-Andean system like that often attributed to the Lupaqa or the Inka. The Xauxa eco–usezones were very close together; thus, individual communities and surely alliances could produce most of what was needed. Perhaps that is why they did not centralize more or take aggressive action outside of their valley before the Inka arrived. The dynamics of self-sufficiency, war, and exchange remain a further question for future research.

To maintain their internal alliances, the people had to work harder to pay the price for living in close quarters and getting along with former neighboring communities. They also most likely had more garbage, stench, and disease within and around their houses, with more noise in their densely packed homes, much like a medieval village in England.

In the end, there was not verymuch accumulation for the elite families. There was some material gain but it was probably mainly symbolic wealth, which would have required regular circulation and constant validation by acts such as *tinku,* just as they would have had to regularly renew their relations with the *apu,* the deities who owned the land and the animals. The hardworking elites paid a price for their gains. The evidence for political inequality is present, but it was always tempered by neighborhood tensions and additional acts to gain political balance. Their pre-Inka daily world probably did not extend far beyond their communities and neighbors, and included battles for renewal and gain. People's lives in many ways were more restricted than they had been in previous times, though the evidence for feasting (social reciprocity) and identity did markedly increase. Social obligation and interchange intensified, as did their concepts of group identity. The ultimate example of these tensions, differences, and need for identity throughout the Xauxa is seen in the documents discussed by Espinoza Soriano (1971) which state that the Wanka II Tunanmarca folk were the last holdouts against the Inka conquerors in the region. The tale is retold in the archaeology, as the site was quickly and totally abandoned. Many walls were pushed over, and great parts of the site were destroyed. In contrast, some of the residents of the other center, Hatunmarca, lived on in their settlement throughout Wanka III and even in into early Colonial times.

Chapter 14

From Autonomous to Imperial Rule

Terence N. D'Altroy

This volume examines change and continuity in the domestic economy of the Xauxa society of Peru's Upper Mantaro Valley, from a condition of self-rule to incorporation into the Inka empire. In this final chapter, I would like to reflect on the authors' studies, while placing Xauxa society back into the larger context of the Inka empire. The discussion reconsiders the questions laid out in the introduction: to assess how circumstances in one valley can help us probe the nature of imperial–provincial relations, and at the same time return to the project's conception—to contribute to our understanding of household economies in premodern complex societies.

The last couple of centuries before the Spanish invasion of 1532 were an era of striking change in the region. The peoples of the Mantaro were coalescing into larger, more complex polities, while local relations became more truculent. Although the valley had witnessed the Wari expansion at least indirectly in the mid-first millennium A.D., local interactions in the tumultuous Wanka II Period triggered shifts that were more rapid and unsettling than anything seen before. In the northern valley especially, the populace took refuge in large, well-defended, hilltop settlements, while displaying some of the features of incipient social hierarchy. Despite those changes, nothing matched the impact of being drawn into the Inka empire in the fifteenth century. A new political and ideological order, forced resettlement, and extraction of labor taxes and military service altered the cultural landscape on a grand scale.

The principal links among households before Inka rule drew heavily on kin relations, and ties between ordinary heads of household and the elite drew on both kinship and mutual obligation. When the Inkas assumed power, they took advantage of existing relationships by casting their jurisdiction in the guise of the local system writ large (Murra, 1980). They drew on an ethic in which lords received labor for their fields, flocks, and houses, and provided hospitality and gifts to their people in return. To rule the valley's peoples, the Inkas created a province under the direction of a governor and his subordinates, an act that shifted the upper levels of power from local lords to state-approved officials. The top provincial level was held by an Inka appointee, and the Inkas assumed the right to host much of the ceremonial hospitality that fueled political relations. When the Spaniards arrived in 1532, however, most state positions in the Upper Mantaro—from petty lords of 10 or 50 families to grand lords of 10,000 households—were held by local lords, approved by the state. The imposition of imperial rule thus both encompassed and intruded into the existing kin-based political order. Another crucial transformation lay in the creation of the state economy, which drew heavily on local resources and labor for agropastoral and craft production. Finally, much of the populace resettled in lower-elevation, more open settlements, in part at the behest of the Inkas. That tactic reduced the defensibility of local settlements and placed them in areas where the subsistence base shifted from a pastoral–tuber mix toward one that depended more on maize–complex crops.

Inka policies thus created pressures and opportunities for changes in farming, herding, artisanry, exchange, and residence. For the valley's people, the changes affected labor allocations, access to resources, and circulation of finished products. Offsetting the forces fostering change was the Inka reliance on existing socioeconomic formations for production. That approach made a great deal of sense, since local stability and self-sufficiency furthered state interests. Accordingly, it is not surprising that this book's contributors found that Inka-era households had much in common with preceding generations.

In the introductory chapters, we suggested that relations between the Inka state and subject societies arose from a complex array of sources. Some features stemmed from the state's need to sustain itself and to secure control; others arose from the organization of the subject society or the conflicting goals of interest groups; others developed out of cultural or historical circumstances; and still others derived from geographical or environmental context. In the introduction, we sketched out some ways that imperial rule might have affected the household economy. We anticipated, for example, that state rule would have intensified agropastoral and craft production for state consumption. Both written sources and the region's resources suggested that the Upper Mantaro Valley was a prime locale for increased production. We also expected there to have been a flow of technology and sumptuary goods from the imperial authorities down to the household. The Inkas are well known for the widespread distribution of their fine textiles, ceramics, and metallurgy, along with a distinctive architectural style. How that situation would have affected the local society, however, remained unclear. We thought that, as the Xauxa were drawn into imperial affairs and local hostilities abated, the links between household members and larger sociopolitical formations would have changed. In particular, we expected differences between the lords and commoners to have been magnified and greater variety in the roles of individuals within households. We also surmised that the conflicting interests of the state and households in allocating labor would have led to changes in household composition. One idea was that household size might have increased, to provide a larger labor pool for each taxpaying unit. Finally, we suggested that resettlement and the state's alienation of resources would have combined to change household production and consumption, with ripple effects occurring in labor allocation and scheduling.

Conversely, we thought that the domestic economy would have remained stable in many ways. In addition to relying on self-sufficient local societies to extract resources and to produce a range of material goods, the Inkas claimed legitimacy for their rule as an extension of hierarchical and reciprocal relations already present among Andean societies (Murra, 1980; Rostworowski, 1999). Moreover, the same kinds of techniques were often used to produce food or goods for the state as were employed for the household, albeit with changed labor demands. Furthermore, the persistence of local forms in kinship and economic relations under the far more disruptive colonial rule has been well chronicled (e.g., Rostworowski, 1978, 1983). Despite the reach of Inka power into daily life, therefore, we felt that state administrators would have had neither the means nor the interest to intervene in many daily activities of even the most fully integrated societies. We therefore supposed that changes from the Late Intermediate Period (LIP) into the Inka era would have left much of the domestic economy largely intact, Accordingly, the balance between modification and stability in the domestic economy seemed an open issue as we began our field research.

THE REGIONAL CONTEXT

It will be worthwhile to step back a bit at this point to review the setting of the Upper Mantaro Late Horizon communities. We need to keep in mind that the Xauxa and Wanka were the most populous societies of central Peru and that the largest LIP towns of the Upper Mantaro rivaled any mountain settlements north of Cuzco. Although the populace was exceptional in its scale, leadership was not highly centralized and the region's societies were typical of the Peruvian sierra in many ways. Like their neighbors, their socioeconomic relations were based in the *ayllu.* The fractious political relations were typical of the Andean highlands at the time, as was the gathering of population in high-elevation, defensible settlements. Similarly, the residents pursued a typical mixed agropastoral subsistence economy, with some household and community craft specialization but no evidence of markets.

Under Inka rule, the valley was intensively incorporated into Tawantinsuyu and seems to have been favored by some rulers, including Wayna Qhapaq and Waskhar. Hatun Xauxa's position made it an important node along the royal highway—a main connection point between the highlands and coast. The Inka incorporation was unusual in some ways, particularly in the scale of imperial agriculture and storage facilities. Nevertheless, there were perhaps half a dozen other provincial centers on a par with Hatun Xauxa, so that the region provides a prime example of how a subject society was well integrated into the central part of the empire.

The yawning holes in our knowledge about Hatun Xauxa raise a concern that our data on Wanka III economic activities are more incomplete than those of Wanka II. We know, for example, that the cottage industry crafts seen in local towns became a smaller slice of the economic pie under the Inkas. Drawing from local informants about fifteen years after the Spanish conquest, Cieza de Leon wrote that Hatun Xauxa had housed woodworkers, weavers, and metalsmiths (see Chapter 4). His account fits what is known from other Inka provincial centers, that were partially dedicated to artisanry for the state (e.g., Lorandi, 1984; Morris and Thompson, 1985; Williams, 1996), but UMARP has recovered few material remains or other written evidence to support his observation. The seventeen surface collections taken from all parts of Hatun Xauxa recovered no spindle whorls, no metallurgical raw materials or by-products, and practically no lithic tools or debitage, even though the collections contained about 6,000 Cuzco-style polychrome potsherds. The lack of material remains associated with craft production is curious, especially given their density on the surfaces of Wanka III Hatunmarca and Marca. Pending further fieldwork, we must assume that at least some artisanry, especially weaving and activities that used lithics, such as wood- and leather working, were concentrated in the subject settlements and not at the Inka center. That pattern would partially contrast with other Inka provinces. In Huánuco Pampa and Milliraya (Peru), or Potrero-Chaquiago and Potrero de Payogasta (Argentina), there is plentiful evidence for production of textiles, ceramics, metals, and stone items (Morris and Thompson, 1985; Williams and Lorandi, 1986; Spurling, 1992; Earle, 1994).

The most important political, ceremonial, and feasting activities were also moved out ofthe households ofthe local lords to Hatun Xauxa. Among them would have been political assemblies, calendrical ceremonies, and banquets held during visits by state dignitaries. lnka centers were designed with vast open plazas, in which a platform was a focal point for ceremonies attended by great throngs of people. When the Spaniards arrived in the valley in 1533, the plaza and streets were filled with throngs that Miguel de Estete (1917:96–97) estimated metaphorically at 100,000 souls. The assembly of so many people was probably associated with the stationing of Challcochima's army of 35,000 (La Lone, 1982:303–304), but the scale of activity was apparently foreseen and was sustained for several days. Though the dimensions of the central plaza are uncertain because of modern development, the platform mound (28 x 32 m) is on a par with Pumpu, the next major center north of the Mantaro Valley. Pumpu's plaza covers about 17 ha (Matos Mendieta, 1994:2 16), a little less than Huánuco Pampa's 19 ha, which had a much larger platform (32 x 48 m) and far more elegant stonework (Morris and Thompson, 1985). It thus seems fair to assume that Hatun Xauxa's plaza was intended to hold several thousand people at a time. The leap of scale in political hospitality from the Wanka II household and modest community plazas to the imperial Inka center was truly staggering.

Because key public activities were moved out of strictly Xauxa contexts, we might expect the nature of the Xauxa diet to have been less closely reflected in the residues of storage, processing, and serving in the residential complexes of Wanka III than in those of Wanka II. Thus, my inclination is take a more conservative view ofthe apparent narrowing of the difference between elite and commoner diets than might be inferred solely from the faunal assemblages recovered from residential compounds. The Inka-era lords may have consumed a fair portion of the better ingredients of their diet away from home. One effect of such participation in state-sponsored consumption would likely have been to reduce the proportion of the finer cuts of meat in the archaeological deposits of the Wanka III elite households (Sandefur, Chapter 8, this volume). A similar pattern is likely in the botanical remains, especially in maize. As Hastorf (Chapter 7, this volume) observes, the Wanka III shift toward a diet richer in maize was most pronounced among males, which may have been related to their drinking or "eating out" on the state's generosity.

The forcible resettling of colonists would have also altered the region's economic context. As Espinoza Soriano (e.g., 1973, 1975, 1987) has shown, many mitmaqkuna lived in specialized communities of farmers, artisans, or garrisons. In the UMARP region, we have not been able to identify *mitmaq* settlements archaeologically, even though early sources report that people from at least half a dozen such groups resided in the valley (Chapter 2). One Late Horizon site, J43, on the southwest side of the Yanamarca Valley, yielded a small array of unusual, geometrically incised, greyware pottery, but surface collections yielded no clear evidence of specialized craftwork (LeBlanc, 1981). In contrast, newly settled Chucchus and Huancas de la Cruz, which lay next to the main storage complexes above Hatun Xauxa, stood out because of the special character of their archaeological remains. In the materials from their surface and excavated collections, UMARP recovered virtually no recognizable by-products of weaving, pot making, or stone tool manufacture or use. The artifact collections were instead dominated by stone hoes, which were most likely used in maize fanning (Earle *et al.,* 1987; Russell, 1988; D'Altroy, 1992). The agrarian focus of those two sites suggests that the Inkas were at least partially reorganizing production by founding farming sites near the center.

Several aspects of the Inka occupation should therefore give us pause in interpreting the domestic economy of the Wanka III Xauxa households from which we have data. Many changes from Wanka II to Wanka III were linked to the shift of political, ceremonial, artisanal, and storage activities out of Xauxa households and into Inka installations. Although those changes were most closely tied to the highest levels of regional power, they would have changed activity mixes among both elite and commoner households. Additionally, the obligations of the state and local emulation resulted in the adoption of Inka architectural features and use of Inka-style objects in subject residences. In light of that situation, we should be mindful that our view of Wanka III household economics has been based on a somewhat different part of the regional economy than was our perspective on Wanka II.

THE ARCHITECTURAL CONTEXT

The architectural studies (Chapters 4,6) highlight important issues in the transition from Wanka II to Wanka III. A first point is that most residential compounds under Inka rule looked much like their immediate antecedents. The domestic sectors continued to consist mostly of amorphous congeries of individually enclosed compounds, joined by meandering pathways. In both eras, some patio groups were markedly larger and more complex than others, and give every material indication of having housed the social elite. As DeMarrais (Chapter 6) describes, major divisions existed in the larger settlements of each era, the most prominent being the two sectors of Wanka II Tunanmarca and Wanka II and III Hatunmarca. Other, smaller, walled areas contained scores of compounds. We may surmise that such divisions corresponded to *ayllu,* lineages, or other social units, but cannot yet show that to have been the case with any surety.

The continued modular form of residential compounds from Wanka II to Wanka III contrasted with an increase in the size of both individual dwellings and enclosed patio areas. In explaining the expansion of patio group size, we are not yet sure how much weight to give to use of more open terrain for habitation, or to an increase in household membership (see below). Another shift from Wanka II to Wanka III lay in the proportion of settlement area assigned to civic–ceremonial space and architecture, especially compared to dwelling area. The public areas at Wanka II sites, especially Tunanmarca, were relatively small, and the elite architecture was dispersed throughout the settlement. Under Inka rule, the central area of Hatunmarca was reconfigured. Large areas were terraced and unusually large buildings were erected, some with the rectangular floor plan and wall niches favored by the Inkas; the highest-status dwellings adjoined those areas. The two central areas also yielded the highest densities of Inka polychrome ceramics. As DeMarrais shows, the shift in the source of elite status in Wanka III resulted in changes in the way labor was allocated in architectural construction. Elite houses and compounds were larger in Wanka III and the terracing in elite compounds became more elaborate. In contrast, far more effort was used to trim stones and lay courses for LIP elite houses than for those of Inka-era elites. DeMarrais thus chronicles how architectural displays of status under Inka rule drew more from scale and overall plan than from the quality of execution that marked autonomous rule.

Changes in Wanka III architecture can be fully appreciated only by considering the character of Hatun Xauxa, its auxiliary settlements and support facilities. DeMarrais describes the striking rise in Wanka III of both the amount and proportion of architectural space dedicated to public or ceremonial precincts in the highest-status local towns. Even though the physical locus of power shifted to the Inka center, Wanka III Hatunmarca contained one and perhaps two elite sectors that were far larger than any comparable precinct in any Wanka II settlement. Tunanmarca, which housed maybe three times the number of people in Wanka II as did Wanka III Hatunmarca, contained truly unpretentious public spaces and architecture. The increased construction of architecture to stage ceremonies or civic acts suggests that ritual was given a more structured, more public role in Xauxa communities with the Inkas in command. The evidence also shows that the elites of Wanka III had greater call on labor service for residential construction than did their predecessors. Although early written sources often noted that native lords had rights to household and agrarian labor service, we cannot yet show how much ofthat labor drew from larger elite households or from community service.

Together, those patterns suggest that Wanka III architectural layouts, both residential and civic-ceremonial, were more planned than was the case previously. The architecture of Wanka III sites formed part of the modified order of status display that integrated Inka elements, but the settlements formed only part of the new regional hierarchy centered at Hatun Xauxa.

AGROPASTORAL PRODUCTION IN WANKA III

As described earlier, the Inkas both built on existing economies and developed a partially independent state economy. Because production for the state was added to the existing economy, which did not have an elaborate political element, production by household members had to be intensified to meet the new demand. The authors here have shown that the increased demand for labor for state ends affected the Xauxa domestic economy in both the subsistence and craft sectors.

Xauxa subsistence, like that of many highland groups, was based on mixed farming and herding. The agricultural importance of the Mantaro Valley was attested to by the size of the indigenous population and the scale of the Inka storage facilities. Hastorf s analyses (Chapter 7) showed that the plant foods that were processed and consumed within Wanka II and III households conformed well to the kinds of crops that could be grown near the settlements. In Wanka III, the residential shift toward maize lands was matched by an increase in the incidence of maize in the occupational levels of Xauxa dwellings, in part induced by lnka ceremonial practices. Sandefur's analysis (Chapter 8) of the faunal materials shows, however, that the shift downward did not reduce pastoralism or meat consumption among the Xauxa. She suggests that the amount of land available for herding may have increased under the Inka-imposed peace. A key impact of the conquest, therefore, was to diversify and improve the basic diet of the average Xauxa household. That occurred not by introducing new crops or animals but by making lands that could be used to produce a wider diet more accessible to the populace, using its own resources.

The Inkas intensively exploited the valley's productivity. Several archaeological patterns, described in detail elsewhere, suggest that the Inkas developed a set of farms around Hatun Xauxa (D'Altroy, 1992). It is intriguing that the expansion offarm production left few of the expected archaeological consequences, apart from high densities of hoes

(Russell, 1988). For example, there is little, if any, identifiable evidence for increased irrigation, terracing, or other forms of land improvement under lnka rule. In fact, Hastorf and Earle (1985) have shown that the use of canal systems, lynchets, and terraces may have actually decreased from Wanka II to Wanka III. Upon reflection, the lack of lnka terracing is not that surprising, Most of the elaborate Inka terracing is concentrated around Cuzco, often on lands identified as royal estates (Hyslop, 1990; Protzen, 1993). Considering the amount of underused, good farmland in the main Mantaro Valley in Wanka II, it is little wonderthat the Inkas availed themselves ofthat area for large-scale farming rather than have terraces built.

Hastorf s analyses of botanical and osteological remains, coupled with Russell's (1 988) evaluation of the lithic assemblages, nonetheless suggest that maize farming was intensified during the lnka occupation. Moreover, the population seems to have grown slightly from Wanka II to Wanka III (D'Altroy, 1992). We are thus faced with the apparent paradox that agricultural production increased while pressure on land resources was reduced. The key to this oddity lies in the fact that the Inka-imposed peace opened land for farming that had been inaccessible earlier, but the gain was offset by an increased demand for *labor.* The need to fill the state's larders required a major step-up in the region's food output, an effort largely borne by the valley's farmers as part of their labor taxes. The scale of work may be appreciated by realizing that labor input in UMARP's study region would have had to be increased about 1.3 times to support just 10,000 additional males for a year. Elsewhere, I have estimated that the state's storehouses had the capacity to support an army the size of Challcochima's force of 35,000 for more than eight months, which would have demanded a immense productive increase (D'Altroy, 1992:161, 175). There seems little doubt that the valley's inhabitants were indeed put to work farming for the state, just as they reported to the inspector Andrés de Vega in 1582 (Vega, 1965:169), but they did not lose much existing farmland as a consequence.

The clearest evidence of intensified household craft production for state consumption lay in weaving, as described elsewhere by Costin (1993). Murra (1962) drew attention to the importance of cloth in Andean societies as utilitarian object, prestigious gift, and sacrificial material; the enormous amount of labor committed to weaving specialists has been documented elsewhere. For example, as many as 500 Wanka households were resettled at Lamay, near Cuzco, to weave for the state (Toledo, 1940a:71). Archaeologically, concentrations of weaving tools, including wooden shearing implements, spindle whorls, and bone tools, have been recovered from lnka installations in Peru and Argentina (Morris and Thompson, 1985; Williams and Lorandi, 1986; Calderari, 1992).

Those cases were concerned with specialized weaving communities, however. Where Costin's analysis takes us forward is in understanding the effects of weaving on the daily life of women, for whom spinning and cloth production were a constant burden. She shows that status-related differences in textile production and agriculture were present before the arrival of Inka rule, and that cloth production formed a more important part of the domestic economy in high-elevation settlements that were heavily committed to pastoralism. She then demonstrates that, under Inka rule, the status and elevation distinctions disappeared, while the spinning stage (i.e., spindle whorl density) of textile production doubled. An essentially equal spinning burden was imposed on elite and commoner, but the intensity of thread making among Wanka III communities was not evenly applied. Instead, spinning seems to have been balanced against other productive activities, such as ceramic and stone tool manufacture. A central theme running through her work is that the roles of men and women were clearly different in both periods. Production fell most heavily on the shoulders of females, young and old, although spinners could also be boys, old men, and handicapped individuals. Costin is thus able to show that textile production was largely the duty of women, but the distribution of the textiles was the province of elite men (Wanka II) or the state (Wanka III).

TECHNOLOGICAL CHANGES

In the introduction, we noted that models of empires suggest that there is often a flow of technology from the core polity to subordinate regions. Wallerstein (1974) has emphasized that point for relations between Europe and its colonies, arguing that the exportation was related to intensified production of targeted resources, whether as the raw materials or the finished products that were exported to the core (see also Wolf, 1982). A similar argument has been made for Mediterranean and Mesopotamian empires (e.g., Ekholm and Friedman, 1979; Algaze, 1993, i.p.), but the evidence for appropriation and dissemination of technology is not so straightforward for the lnka empire.

The Inkas appear to have commandeered some technologies (and their practitioners), which they then elaborated to their own benefit. The most notable examples of the acquisitive approach to technological competence occurred in architecture and metallurgy. Investigators of lnka architecture have suggested, albeit with some dissent, that the imperial style of cut stone architecture had antecedents in the monumental styles of the Lake Titicaca basin, especially Tiwanaku, which fell out of power only three centuries or so before the earliest lnka cut stone buildings (Gasparini and Margolies, 1980; cf. Protzen, 1993). Of the lnka centers north of Cuzco, Huánuco Pampa and Tumipampa are especially notable for their finely cut stonework. The existing evidence for superior stone cutting in the Upper Mantaro is negligible, however. The finest-laid masonry preserved in the area is found at Cutocuto, an Inka installation in a lateral valley, whose masonry does not approach the best lnka stereotomy. With the exception of some dressed stone in a bridge traversing the Río Mantaro near Hatun Xauxa and some stones used in the arch of the main church at modern Jauja, no other evidence of cut stone architecture has been found in the region. None of the preserved architecture at Xauxa settlements contains any finely cut stonework, and, in fact, less labor was invested in trimming and laying courses of stones in Wanka III elite houses than in Wanka II dwellings.

Owen's work (Chapter 11) shows much stronger evidence of technical change in metals production. Technological shifts in metallurgy under Inka rule were dramatic throughout the Andes (Lechtman, 1984). The Inkas appropriated and then disseminated raw materials and technology in much of the empire. Recognizing that the smiths of the Peruvian north coast were master metallurgists, the Inkas transported them to Cuzco, once the empire of Chimor was subjugated (Rowe, 1948). The most notable technical transfer underwrote the shift from arsenical bronze to tin bronze, a change seen from Peru to Argentina (e.g., González, 1983). Owen has identified three features of metallurgy in Xauxa households that stand out in the transition from Wanka II to Wanka III. First was the concentration of manufacturing debris in elite compounds in Wanka III, which suggests that access to metal resources became more closely tied to political power under lnka rule. The Inkas ostensibly reserved rights to all metals in the empire to themselves, though written evidence suggests that the rule was not fully honored (Berthelot, 1986). Instead, local elites retained some independent access to metals, even under state dominion. Owen's analysis supports the view that the local elites did not entirely lose the prerogative to make and use metal products on their own. A second change in manufacturing technology lay in the shift from arsenical copper to tin bronze, which required alloying of local copper ores with tin mined from the south Andes. The tin used in Upper Mantaro bronzes was probably imported from Bolivia in the form of cassiterite (Howe and Petersen, 1994; see Owen, 1986b). Third was the shift from silver to tin bronze in decorative metal items. As Owen describes, in the Upper Mantaro, tin bronzes were used both for utilitarian items and to replace silver decorative goods, which largely disappeared from household contexts under Inka rule, probably because the Inkas appropriated the silver for their own use.

The technology of ceramic manufacture used in the Upper Mantaro region also changed under Inka dominion, although not in the same way that metallurgy changed. As Costin and D'Altroy (Chapters 9, IO, this volume; see also Hagstrum, 1989) describe, the Inkas introduced a much finer quality of pottery to the region, in the form of Cuzco-style polychrome vessels made from raw materials to which the Xauxa did not have access. Although the pottery seems to have been made somewhere in the region, the technology did not filter down to the manufacture of pots in the local styles. Instead, the top end of the indigenous pottery was supplanted by the Inka vessels, and the local styles continued to be made in much the same way as they had been before the advent of Inka rule.

The Inkas thus changed the domestic technology of the Upper Mantaro populace in only a limited way. The most notable changes lay in metallurgy and elaborate ceramics—crafts more closely associated with status than with utilitarian activities. That situation conforms to the general pattern that state intrusion into the household economy was selectively focused on materials associated with status and state activities.

RELATIONS OUTSIDE THE HOUSEHOLD

The revamping of the region's political organization under the Inkas produced some of the most dramatic changes in the economic life of Xauxa households. One innovation arose from the state's assumption of the prerogative of underwriting political hospitality. Changes in the ceramic assemblages from Wanka II to Wanka III illustrate this shift well. As Costin shows (see also Earle, Chapter 12), the local vessels that were probably used to cook and serve food and drink in political repasts were largely supplanted by Inka-style pots made in the distinctive Cuzco polychrome style. Thus, the legitimation of feasting in elite households—previously an act central to the social identity of the local lords—was reserved by the state. Though the material remains have long since disintegrated, it seems certain that fine textiles would have been used similarly. The state's conferral of cloth in the Inka style would have been a highly visible emblem of the apical source of power. Such visual symbols must have been potent markers of state dominance, especially when we consider that the Cuzco and Wanka dialects of Quechua were not fully mutually intelligible (Cerrón-Palomino, 1972; see Morris, 1995; DeMarrais, Castillo, and Earle, 1996).

At present, we do not know exactly how the Inkas' symbolic sponsoring of hospitality would have affected specific acts or rituals within the household, but some lines of evidence are suggestive. A marked increase in the number of plates and the disappearance of deep basins in the Xauxa ceramic assemblages has previously been noted, whereas large jars and bowls continued to be important elements of the ceramic assemblage (Costin and Earle, 1989). Such a shift suggests a change in the character of foods served, most likely from stews to cooked pieces of meat, as Sandefur describes. Hyslop (1 993) also observes that plates increased in the ceramic assemblages of many regions under lnka rule. Sandefur has found parallel evidence for an increase in meat roasting in the Valle Calchaquí, of northwest Argentina, under lnka rule (D'Altroy *et al.,* 2000). Given that the amount of maize consumed also increased, the state could lay claim to having raised the quality of hospitality—a dubious trade-off for a loss of autonomy.

On a related point, the admittedly limited evidence for ritual activity within households within Wanka II and III is intriguing. Sandefur (1988a) has documented the presence of animal sacrifice, especially dedicatory burials of guinea pigs, associated with house foundations. The continued presence of such unpretentious evidence for household rituals from Wanka II into Wanka III is suggestive of the continuity of local belief systems that characterized lnka rule. It is worth noting that a late (Wanka III–IV) household cache, in an elite compound at Hatunmarca, contained a miniature Inka-style polychrome flared-rim jar at the foundation level of a rectangular structure (J2=1-20). Such additions to the ritual repertoire are far more evident in the mortuary use of Inka-style objects, such as bronze *tupu* pins and polychrome pottery (Owen, Chapter 11, this volume; Owen and Norconk, 1987). Together, such practices suggest that the Xauxa were not simply adopting the trappings of the Inkas in publicly exhibiting status. Instead, they were drawing on lnka symbols as sources of power in their private expressions of ideology. At the present time, we cannot discern precisely how any particular beliefs or practices were drawn into indigenous life. Nonetheless, it seems reasonable to conclude that the ideological side of the lnka incorporation was deeper than co-opting local gods and imposing a state religion at the provincial center.

ECONOMIC CONTINUITIES

As radical as some changes were under Inka rule, the evidence is equally interesting for the economic continuities seen among the Xauxa. Most importantly, households and communities continued to be largely self-sufficient in their subsistence and utilitarian craft production. All of the residential compounds that UMARP excavated from the Wanka II and III periods showed evidence of production, processing, storage, and consumption of foodstuffs. A key line of evidence suggesting self-sufficiency was the localized use of resources by community members, brought out by Earle's evaluation of exchange before and under Inka rule. Tellingly, Hastorfs analysis showed that the botanical resources appearing in residential compounds generally matched those that could be obtained within a short radius of the settlements' locations. The shift from higher to lower altitudes under lnka rule was paralleled by a shift from a tuber-dominated to a lower-elevation plant mix. Thus, though the immediate environmental context changed, the localized use of resources remained consistent.

As Earle described, two closely related changes that we had anticipated did not occur: rises in occupational specialization and regional exchange. For example, there is little to no evidence for increases in community specialization in ceramic or stone tool manufacture, or for exchange with other local communities. We had expected such shifts under the Inka peace as conditions for exchange improved from the turbulent Wanka II phase. Instead, communities remained largely self-sufficient in their agrarian and utilitarian craft activities, with some notable exceptions.

Russell's (1988) lithic analysis draws attention to one important anomaly to the pattern of community self-sufficiency—the manufacture of the finer chert tools, which was concentrated in Umpamalca in Wanka II and in Hatunmarca in Wanka III. In each case, the community that made tools for local exchange was the one closest to the major quarry at Pomacancha, a situation that underscores the focus on nearby resources. In contrast to the finer blade tool manufacture, however, casual flake tool production was a regular feature of household activity before and under the Inkas. Another exception lay in pottery making, which Costin shows was concentrated in Umpamalca in Wanka II and then in Marca in Wanka III. In each case, people living near particular raw materials seem to have made goods in cottage industries, with the intent of exchanging them for products more readily produced elsewhere. It is important to underscore that the production stayed within the purview of the households and that nothing suggests the state intervened in such craftwork. Local ceramic styles such as Base Clara and Wanka Reds continued to be organized much as before, for example. Thus, although some of the conditions of life changed radically, the communities' farming and household crafts retained their own character. In fact, Sikkink in Chapter 5, this volume, shows the resilience of a mixed farming–herding–craft economy among households of the region into the present day.

In addition, despite the appearance of a kind of forced urbanism at Hatun Xauxa (see Morris, 1972), there is little evidence for emerging urban formations among Xauxa communities. It is especially noteworthy that the density and maximum size of settlements declined under Inka rule. Under the circumstances, it seems fair to say that the adoption of the imperial trappings of status may have created a more urbane elite, but not a more urban one. The major distinctions that were apparent in Wanka II were elaborated in Wanka III, but we found no evidence for a qualitative shift in household production. That finding is in accord with the documentary evidence suggesting that the Inkas left internal community organization essentially intact and reorganized societies at a grander level.

COMPARISONS WITH OTHER REGIONS OF THE INKA EMPIRE

In recent decades, the image of Andean societies under the Inkas as uniform and micromanaged has been supplanted by a more realistic view that leaves room for diverse social forms and administrative relations. There seems little doubt that the Inkas applied orderly methods to their rule, but the distinctive cultural and natural settings of each region favored maintaining distinctive social formations in the provinces. Following the lead set by the Huánuco Project (e.g., Ortiz de Zúñiga, 1967, 1972; Morris and Thompson, 1985), several studies have used written and archaeological evidence to explore how the Inka conquest affected specific provincial societies (e.g., Julien, 1983, 1993; Raffino, 1983, 1993; Williams and Lorandi, 1986; Earle *et al.,* 1987; D'Altroy, 1992; Malpass, 1993; Matos Mendieta, 1994). Historical work has provided particular insight on provincial governance and the development of state farms and enclaves of craft specialists (e.g., Murra, 1975;

Wachtel, 1982; Espinoza Soriano, 1987; Rostworowski, 1999). Such studies have also advanced our understanding ofthe nature of local societies, their sociopolitical relations, and their duties to the state in their home communities (e.g., Rostworowski, 1983).

In contrast to the historical research, the archaeological end of recent work on the Late Horizon has tended to focus on imperial Inka installations. Over the last couple of decades, researchers have greatly advance our understanding of the nature of provincial centers, the road system and its associated way stations, and storage facilities (e.g., Alcina Franch, 1978; González Carié, Cosmopolis, and Lévano, 1981; Julien, 1983; Raffino, 1983; Hyslop, 1984, 1990; Morris and Thompson, 1985; Williams and Lorandi, 1986; Gonález and Díaz, 1993; Earle, 1994; Matos Mendieta, 1994; D'Altroy *et al.,* 2000). Work in the Cusichaca region (Kendall, 1985; Kendall, Early, and Sillar, 1992), at Chinchero (Alcina Franch *et al.,* 1976) and Ollantaytambo (Protzen, 1993) has similarly provided insight into the nature of Inka sites in the heartland. Together, those studies draw attention to both the exceptional planning of the Inka provincial infrastructure and the enormous variety of installations that resulted.

Regrettably, although some evidence is available, archaeological data on change and continuity in subject communities under Inka rule are far more limited. As part of its regional design, the Huánuco Project conducted survey and excavations of the Inka-era occupations in the Chupaychu, Yacha, Queros, and Wamali ethnic areas (Morris and Thompson, 1985:119–162; Grosboll, 1993; Julien, 1993). The results suggest that state-related activities were far more heavily concentrated at the regional center, Huánuco Pampa, than was the case in the Upper Mantaro. A few Inka polychrome sherds were recovered from several sites in the Huánuco region, but only one site yielded a significant Inka assemblage. At Ichu, most of the Inka pottery was concentrated in what may have been the dwelling and kitchen of Puacar Guaman, the paramount lord of the Chupaychu between 1542 and 1560. Morris and Thompson (1985:142) observe thatthe Inka-inspired rectangular floor plan and niches of the main buildings, along with the high density of Inka ceramics, fit what might be expected from the residence of a local leader recognized by the state.

Both Ichu's architectural and ceramic features parallel what UMARP encountered in the elite compounds of Hatunmarca and Marca. It seems likely that the elite residents held analogous, though perhaps not identical, positions in their respective provincial hierarchies. The Upper Mantaro situation is distinct from Huánuco, however, in the far greater archaeological impact of the Inka on the Xauxa, minimally in settlement distribution and material culture. Readers may recall that the vast majority of the Mantaro residents were resettled during the Late Horizon, whereas the evidence for resettlement in the Huánuco region is not so sweeping, although some resettling did occur (Grosboll, 1993). Well over 100 sites in the Mantaro have also yielded Inka polychrome sherds, and Hatunmarca and Marca likely contain over one million Inka sherds apiece. Much of the present volume has documented the pervasive effects of the Inka assimilation on the Xauxa domestic economy, despite fundamental continuities in household composition, labor mobilization, and subsistence technology.

The comparative dearth of Inka material remains in Huánuco villages does not imply that the state had little impact on the residents, however. Although precisely comparable archaeological evidence is not available for the Huánuco *etnías,* the *visitas* of 1549 and 1562 recorded a wide array of labor obligations, tabulated by census counts. According to the inspections, some 37 kinds of labor were required, among them military service, guard or road duty, portage, various kinds of farming (maize, coca), craft production (e.g., ceramics, sandals, net snares), gathering of wild resources, mining, and masonry. It is especially notable that only 40 households made pottery and 400 worked on construction, which yield the two principal kinds of remains that archaeologists employ to study the Inka economy. In contrast, almost 40% of the workers were assigned to service positions that would not have directly produced many material objects, for example, as military guards or security personnel for high-status individuals, alive and dead.

The apparent disparity between the archaeological and written evidence on the pervasiveness of the Inka occupation suggests that a great deal still needs to be done to link the two kinds of data effectively (see Malpass, 1993). Whatever the case, there seems little doubt that the domestic economy of the Huánuco region was more deeply affected by the lnka exactions than the distribution of material remains in the lnka style might suggest. Whether the impacts extended to metallurgy, textile production, diet, and other areas of change seen in the Upper Mantaro remains to be ascertained.

In two other well-studied highland regions, the Inka impact on local settlement patterns seems to have paralleled that of the Upper Mantaro in important ways. Schreiber's (1987) and Sciscento's (1990) analyses of the Carhuarazo Valley of southern Peru suggest that the local populace may have been moved to lower elevations for some of the same reasons that affected the Xauxa: cultivation of maize–complexcrops and ease of control over the subject peoples. In the Lupaqa area of the Lake Titicaca basin, the power of the native society may have been especially important in leading to the lnka policy of founding a new center along the lakeshore at Chucuito and of vacating the elevated, heavily fortified settlements (Hyslop, 1979; Julien, 1983). As with Huánuco, a detailed Spanish inspection provides a wealth of information on labor duties owed the state (Diez de San Miguel, 1964). The military obligations of the Titicaca societies seem to have been especially onerous. In both areas, it seems likely that household labor would have been stretched at key points in the subsistence cycle, and that the subject societies' access to easily available natural resources would have been modified because of forced resettlement and state alienation of resources. Despite such prominent parallels, however, archaeological data on the Late Horizon domestic economy are not available for those two regions and we cannot yet draw explicit comparisons about how any changes would have been realized.

One area for which there is limited evidence on the Late Horizon domestic economy is the Calchaquí Valley of northwest Argentina, a more marginal region of the empire (D'AItroy, 1994; Earle, 1994; D'Altroy *et al.,* 2000; Williams *et al.,* i.p.). Because the Calchaquí data are mostly from the Late Horizon, a comprehensive examination of the Inka impact is not yet possible, but some useful comparisons may still be drawn with the Upper Mantaro. A series of state installations was constructed, the most important in the northern valley being a complex focused on Cortaderas and Potrero de Payogasta. In midvalley, intrusive lnka sectors were built in Puerta de La Paya and Guitián (González and Díaz, 1993). At the former site, Ambrosetti (1907–1908) excavated 202 tombs with fine Inka provincial ceramics, metal goods, and other prestige objects. With respect to local demography, historical studies have shown that the Pular *etnía* was given expanded lands and preferential treatment by the Inkas, whereas the recalcitrant Calchaquíes were moved out of some of their traditional lands, apparently to promote state security. Similarly, *mitmaqkuna* were brought in from the Yavi region of southern Bolivia (Lorandi and Boixadós, 1987–1988). As in the Upper Mantaro, at least one major settlement (Cortaderas

Alto) was apparently vacated during the Inka occupation. The Inkas also developed state farms, though on a much smaller scale than that of central Peru. Metallurgical evidence from the Pular settlement of Valdéz suggests that copper was mass-produced in local towns under autonomous rule, while under Inka rule, the fine finishing work on metals, shell, and mica seems to have been focused at state settlements, such as Potrero de Payogasta (Earle, 1994).

Broadly speaking, then, the major differences between the central Upper Mantaro Valley and the more peripheral Calchaquí Valley include a lesser scale of state construction in Argentina and a lower incidence of Inka-related material culture in local communities. Nonetheless, scores of late prehistoric settlements in the southern province do exhibit Inka ceramics. Once more research has been completed on the Calchaquí, we expect to be able to draw a finer picture of domestic economics before and under lnka rule. Together, these data suggest that the Inka occupation was far more pervasive in local communities in the southern empire than has often been thought (e.g., González, 1983; Raffino, 1993; although see Williams and Lorandi, 1986).

Although the Inka occupation of the Upper Mantaro clearly had greater impact than it did elsewhere, it is also important to observe that some regions of Tawantinsuyu were far more heavily restructured than the Xauxa area. Three locales that may be mentioned briefly in this regard are the core area around Cuzco and two valleys that seem to have been entirely vacated by the Inka and resettled by imported colonists. Historical documents reported that the Inkas, starting under the direction ofthe emperor Pachakuti, evacuated the Cuzco basin, rebuilt it, and resettled it with peoples from all over the empire, all according to a centrally conceived plan (see Hyslop, 199059–101). Wankas were among those brought in to live in a textile-producing community in the Yucay Valley, just north of Cuzco. Under Wayna Qhapaq, the Cochabamba Valley of Bolivia was also stripped of its native populace and 14,000 workers were brought in, some temporarily and some permanently, to work state farms (Wachtel, 1982). Similarly, the valley around the lnka center of Vilcaswamán was evacuated and an lnka facility with a colonist garrison was established (see González Carré *et al.,* 1981). Such massive demographic engineering must have had dramatic effects on the daily life and domestic economy of many of the people who were either moved out or brought in. It is hoped that the archaeological evidence needed to draw detailed comparisons with other regions will soon be gathered and published.

CONCLUDING COMMENTS

This study has attempted to contribute to the literature on prehistoric domestic economies. We have been concerned both with one case in a particular cultural–historical setting, and, more generally, the *economies* of autonomous midrange societies and preindustrial empires. The authors have shown that the nature of household labor, composition, and resource use resulted both from independent decisions made by members of mostly self-sufficient agrarian communities and the demands of an extractive political economy. They have also demonstrated that, while significant changes occurred as a result of the formation of Tawantinsuyu, important elements of daily life remained stable. As Murra, Rostworowski and other historians have emphasized, documentary sources indicate that the kinship bases of politics and economics, the technology that people used to gain their livelihood, and household and community autonomy in subsistence production remained largely unchanged under imperial rule. Much of UMARP's archaeological evidence conforms to such a view of the domestic economy. The continuities and local self-reliance in daily life should serve as a counterweight to views of early empires that focus disproportionately on the state's activities in explaining life in the provinces.

It is equally true that the Inka occupation radically transformed key aspects of life at local communities in ways that are understandable through comparative models of preindustrial empires. The intensified production of agricultural, pastoral, and mineralogical resources for state use, especially, seems to have been a widespread feature of preindustrial empires. The Inkas extracted enormous quantities of human and natural resources, and some targeted products were apparently shipped off to Cuzco. They also used the valley as a breadbasket and staging ground for activities elsewhere, such as the conquests in Chachapoyas and Ecuador. Most of the effort to accomplish state goals came from the local populace, who lost autonomy and their disposable labor. Nonetheless, the province was not simply exploited. The Cuzqueñan rulers granted the region's elites a prestigious status and invested much in integrating the Xauxas and Wankas into the empire. That situation resulted in neither a complete reformation of the local society nor its domestic economy, however. Instead, the impact of imperial rule in local households was selective, focused around the political economy and ceremonial relations.

In summary, the Upper Mantaro region is best seen as an example of a well-integrated province close to the heartland, not as an archetype for all regions. As the more detailed results of more regionally focused studies are published, we hope that the results reported here will form part of a more refined understanding of both the complexities and broad patterns of life in the premodern world.

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