

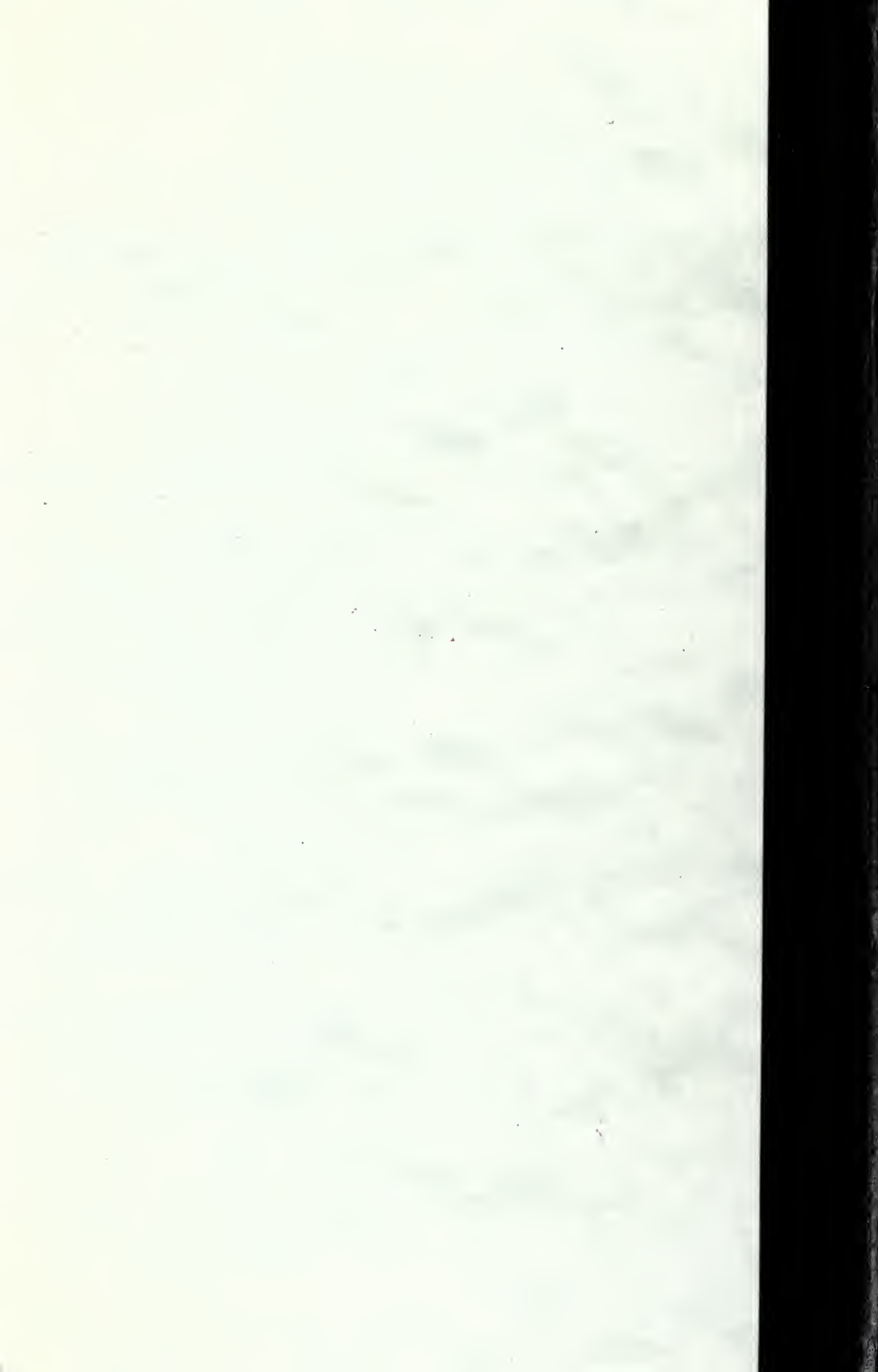
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FIELDIANA

Anthropology

NEW SERIES, NO. 23

Archaeological Research at Tumatumani, Juli, Peru

Charles Stanish
Lee Steadman

With a contribution by:
Matthew T. Seddon

August 31, 1994
Publication 1457

PUBLISHED BY FIELD MUSEUM OF NATURAL HISTORY

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**Archaeological Research at
Tumatumani, Juli, Peru**

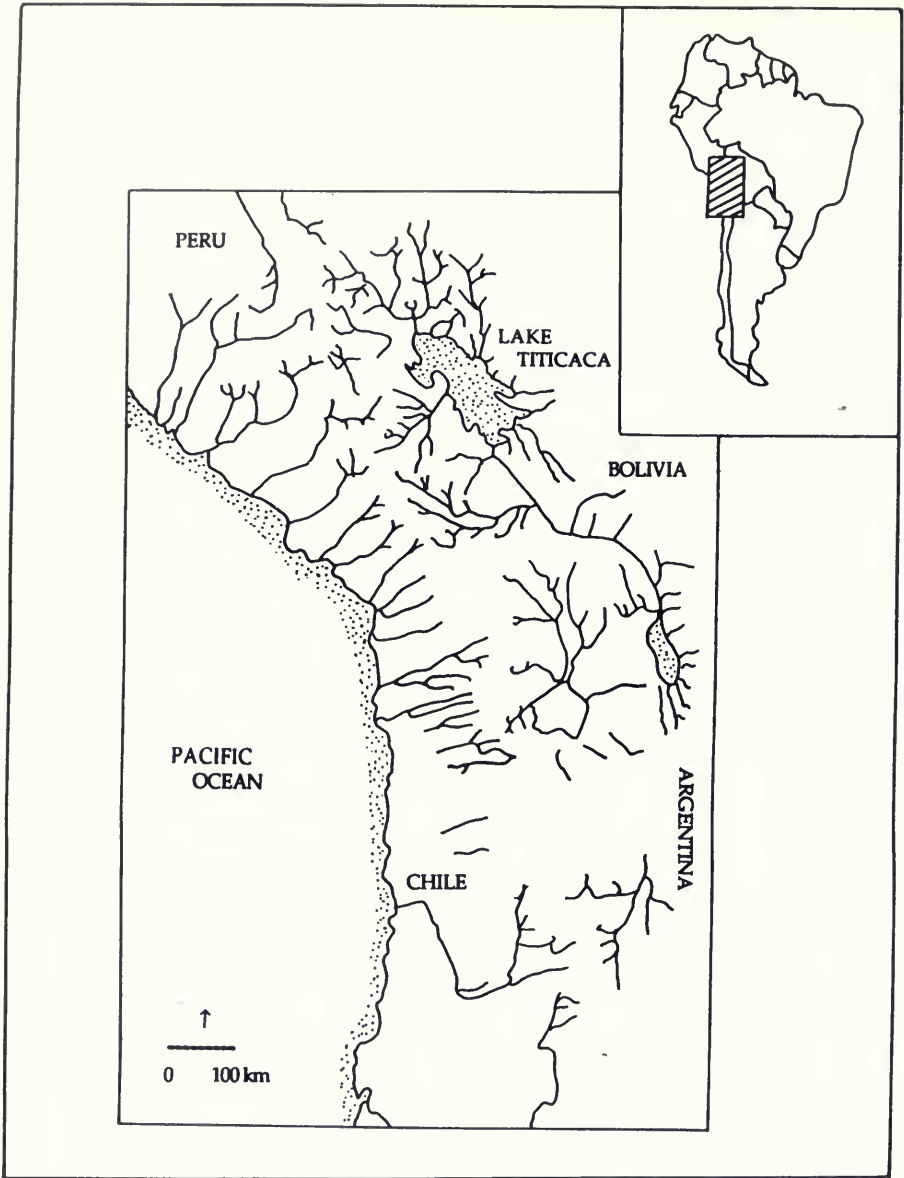


FIG. 1. Map of south central Andes.

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Charles Stanish

*Associate Curator
Department of Anthropology
Field Museum of Natural History
Chicago, Illinois 60605-2496*

Lee Steadman

*Anthropology Department
University of California
232 Kroeber Hall
Berkeley, California 94720*

**With a contribution by:
Matthew T. Seddon**

*Anthropology Department
University of Chicago
1126 East 59th Street
Chicago, Illinois 60637*

**Accepted April 2, 1993
Published August 31, 1994
Publication 1457**

PUBLISHED BY FIELD MUSEUM OF NATURAL HISTORY

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Library of Congress Catalog Card Number: 93-73815
ISSN 0071-4739
PRINTED IN THE UNITED STATES OF AMERICA



This book is dedicated to the memory of Victor Barua Remy. Victor was the director of the Cuajone area of Southern Peru Copper Corporation where I spent my first season in Andean archaeology, in 1982. Victor and his wife Lucy treated me as one of their family. My first trip to Lake Titicaca was as their guest on one of their rare vacations in July of that year. Five years later I returned to Juli to begin the research reported on in this book. Victor was a strong supporter of the archaeology of Moquegua and a dear friend. His passing is a great loss to us all.

C.S.S.

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Tumatamani is located near the modern town of Juli, Peru, on the shores of Lake Titicaca. It is one of the principal Formative and Tiwanaku period sites in the Juli–Pomata region of the southwestern Titicaca Basin. This report presents the results of intensive surface mapping, controlled surface collections, and excavations conducted at the site. These data serve to define the Formative period culture of Sillumocco that dominated the region prior to the expansion of Tiwanaku into the area. We also describe a major Tiwanaku site type in the area and offer a detailed analysis of ceramic and lithic artifacts from the site.

Preface and Acknowledgments

In the spring of 1988, the Juli Project began intensive archaeological investigations in the Juli region of southern Peru. Juli is located in the proto-historic and historic Lupaqa zone in the southwestern Titicaca Basin. The Juli Project mapped, systematically collected, and excavated two sites. The first site is known as Pucara Juli. It dates to the Late Intermediate or Altiplano period, between approximately A.D. 1000 and 1450. The second site is named Tumatumani and is composed of two large mounds located near the lake edge. Previous research by John Hyslop and Elías Mujica in the 1970s indicated that Tumatumani dated principally to the Formative and Tiwanaku periods of the region. The surface collections, excavations, and detailed surface mapping reported here provide the most systematic data on the site to date.

The 1988 season was funded by the Wenner-Gren Foundation for Anthropological Research, the Montgomery Fund of the Field Museum of Natural History, and Ms. Patricia Dodson. These excavations were conducted in cooperation with, and under the direction of, the National Institute of Culture in Lima and Puno. By 1990, the Juli Project had evolved into the Lupaqa Project, funded by the National Science Foundation (BNS 9008181), the Field Museum of Natural History, the Heinz Foundation, and Ms. Patricia Dodson.

Steadman's research was funded by a grant from the Fulbright-Hays Doctoral Dissertation Research Abroad program (PO22A90021). Seddon's research was supported in part by a grant from the Scholarship Committee of the Field Museum. We offer special thanks to officials of the National Institute of Culture, including Dr. Elías Mujica, Lic. Oscar Castillo, Lic. Oscar Ayca, and Dr. Luis Lumbreras. The project was assisted by the an-

thropological faculty of the Universidad Nacional del Altiplano, including its director, Lic. Felix Palacios, Juan Bautista Carpio Torres, and Lic. Abel Torres Cornejo. Dr. Percy Che-Piu Salazar, Dean of Social Sciences, Sr. Julio Cesar Gomez Gamona, director of the Instituto Superior Tecnológico in Juli, and Ec. Luis Salas Arones, rector of the university, were very supportive of our project. We also gratefully acknowledge the support of Dr. Luis Watanabe M., Dr. Francisco Iriarte B., Dr. Fernando Cabieses, Dr. Michael Moseley, Dr. Don S. Rice, Dr. Alan Kolata, and Dr. Walter G. Tapia Bueno, director of the National Institute of Culture in Puno; Ms. Patricia Dodson of Chicago; Sr. Benedicto Valdez C., mayor of Juli; Sr. Jorge M. Remond Alvarado, provincial subprefect; and Sr. Alberto Miranda Arenas, Sr. Vicente Quispe Choquegonza, and Sr. Manuel Encinas, governors of Chuquito Province from 1988 to 1991. We also thank Sr. Hugo Teodoro Chávez Talavera, provincial mayor of Yunguyu, Sr. Arturo Arce Terrazas, subprefect of Yunguyu Province, Sr. Andres Carbajal and family, Sr. Percy Hernán Calizaya Chuquimia and family, Sra. Fresia Gandarillas Sardón, Sr. Moises Sardón Pelags and family, Srta. Zenaida Espezua Bustinza, and the people of Juli, Yacari-Tuntachawi, Sillucani, and Inca Pucara. Professional help was provided by Edmundo de la Vega M., Cecilia Chávez J., Kirk Lawrence Frye, Edwin Castillo, Adán Umire Álvarez, Lisa Cippolla, Javier Ticona, and Luperio David Onofre Mamani. Student participants included Alberto Sosa B., Elsa Chuquimia Paredes, Clemente Caxi Maquera, David Benjamin Antezana Bustinza, Teodora Atahuachi Chuquimia, Julie Realmuto, Rodolfo Carita Ancco, José Castillo Velo, Lisa Shogren, and Alfredo Curo Chipana.

We also gratefully acknowledge the input from

several readers, including Drs. David Browman, Joyce Marcus, Katharina Schreiber, James Mathews, Brian Bauer, Paul Goldstein, Margaret Goes, and anonymous reviewers of *Fieldiana*. Drs. Luis Lumbreras, John Hyslop, and Luis Watanabe provided important insights into the nature of Tu-

matumani as well. We also thank Dr. Harold Voris, editor of *Fieldiana*. A very special thanks to Marjorie Pannell, Managing Editor of *Fieldiana*, for her infinite patience. Errors, of course, are purely the responsibility of the authors.

Part 1 Background to the Tumatumani Investigations

Charles Stanish
Lee Steadman

For almost two millennia, the Titicaca Basin has been the economic, political, and cultural center of the southern region of the central Andes (*fron-tispiece*). The Titicaca region has been home to one pre-Hispanic empire and countless smaller

political and ethnic groups throughout its prehistory. Without question, the world's highest navigable lake ranks as one of the great centers of native American civilization.

In this report, we present excavation and surface

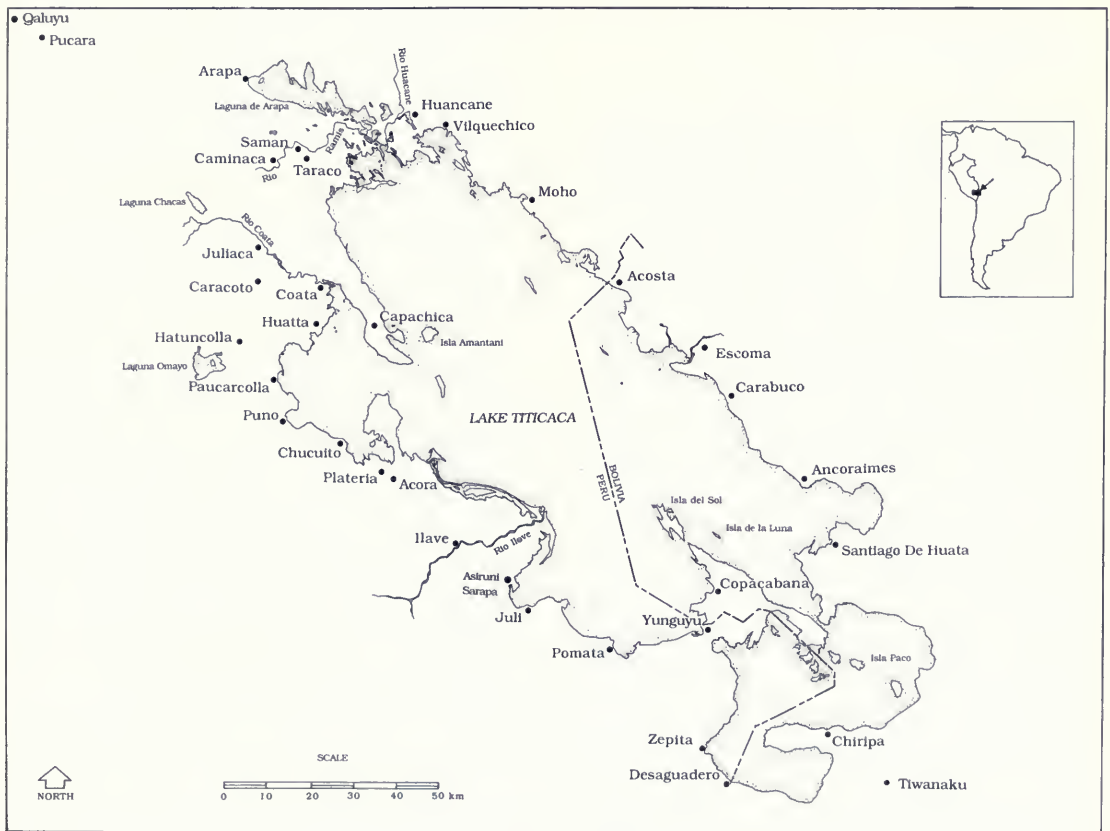


FIG. 2. Lake Titicaca region.

data from the site of Tumatumani, located in the southwestern Titicaca Basin of southern Peru (Fig. 2). Tumatumani was known for years as potentially one of the most important sites in the western Titicaca region and constituted one of the principal sites of the Tiwanaku and Antecedents macropattern proposed by John Hyslop in 1976. The twin mound complex at Tumatumani covers an area of more than 5 ha and was occupied from at least 500 B.C. to the present day. One of the two artificial mounds was rebuilt at least twice by different complex pre-Hispanic polities that controlled the Juli region, attesting to the importance of the site throughout history. This report provides data on the occupational history, the architecture, the ceramic assemblage, and the lithic assemblage from this important Titicaca Basin site. These data help refine the ceramic styles and chronology of the region, define a new Formative period culture that we call Sillumocco, provide insight into the nature of Tiwanaku expansion into the southwestern Titicaca region, and suggest that the Upper Formative period in the region was of greater complexity than previously reported.

A Brief Chronological Background

Naturalists and archaeologists have conducted sporadic research in the Titicaca Basin since the 19th century. This research has provided a broad chronological framework for describing the cultural history of the region. Following Lumbreras (1974), we divide the Formative into three phases: Upper, Middle, and Lower (Fig. 3). The first, sedentary, agropastoral societies in the Titicaca Basin define the Lower Formative period (ca. 2000–1300 B.C.). This early period is very poorly known at the present time. Currently, the Middle Formative/Upper Formative transition dates to the middle of the first millennium B.C. and represents a significant cultural change in the Titicaca Basin. The Middle Formative cultures are early Chiripa (Chiripa Condori and Chiripa Llusco, ca. 1300–650 B.C.), located in the southern Titicaca Basin, and Qaluyu (ca. 1300–500 B.C.), located in the north. The Upper Formative cultures include Pucara (ca. 500 B.C.–A.D. 400), late Chiripa (i.e., the Mamani phase, ca. 650–100 B.C.), Early Tiwanaku (ca. 300 B.C.–A.D. 200), and Qeya (also known as Tiwanaku III), which dates to around A.D. 200–400.¹

The end of the Upper Formative in the Titicaca Basin is marked by the expansion of Tiwanaku out of its core Pacajes territory in the southern Titicaca Basin (Fig. 3). The development of the expansive Tiwanaku polity is archaeologically recognizable by the manufacture of a new pottery style that replaced Qeya in the south and Pucara in the north. This new Tiwanaku ceramic assemblage is known as Tiwanaku Classic or Tiwanaku IV in its earlier phase, and as Decadent Tiwanaku or Tiwanaku V in its later one. These periods date to approximately A.D. 400–750 and A.D. 750–1000, respectively. This chronology is based on the work of Wendell Bennett (1934: 445–459) and Carlos Ponce Sanginés (1981b: Table 1). We borrow from Bermann (1990: 55) and refer to this as the Bennett–Ponce chronology, recognizing that problems still exist with this framework.

By around A.D. 600 or so, the Tiwanaku state most likely controlled the entire southwestern side of the Titicaca Basin, including the Juli–Pomata region. Data from outside the Titicaca Basin area indicate that by at least A.D. 800, and probably earlier, Tiwanaku had expanded throughout the south central Andes (Berenguer 1978; Bermann 1990; Goldstein 1989; Kolata 1983). In this period, Tiwanaku, along with Wari, constituted one of the two great Middle Horizon states of the central Andes. We concur with Schreiber (1992: 275–276) and see Wari as an empire. Likewise, we see Tiwanaku as an expansive, most likely imperial state system.

The end of the Tiwanaku state (corresponding to the end of the Tiwanaku V period) dates to about A.D. 1100, perhaps slightly earlier. Throughout the Titicaca region, the collapse or fragmentation of Tiwanaku gave rise to the proto-historic Aymara *señoríos*, sometimes improperly translated as “kingdoms.” Polities such as the Lupaqa, Pacajes, Colla, and others flourished around the Titicaca Basin until the Inca conquest (Hyslop 1976). These Aymara-speaking groups have been discussed by Andean historians such as Cieza de León, Bernabé Cobo, and Guaman Poma. They paint a picture of intense conflict between these groups, particularly the Lupaqa and Colla, in the time immediately prior to the conquest of the region by the Inca state.

Our best evidence suggests that the Inca conquered the region toward the end of the 14th century A.D. (Julien 1983: 244). The Titicaca region

¹ The dates for Pucara include the Cusipata Phase of Mujica (1987), which dates to approximately 500–200

B.C. We extend the traditional date of Pucara by several centuries, based on our interpretation of the Tumatumani data presented in Part 2.

	South Titicaca	North Titicaca	Juli-Pomata
1500	Inca	Inca	Inca
	Altiplano	Altiplano	Altiplano
1000	Tiwanaku V	Tiwanaku V	Tiwanaku V
500	Tiwanaku IV	Tiwanaku IV	Tiwanaku IV
	Qeya (Tiwanaku III)	↑ ? ↓	
AD/BC	↑ ? L Qalzasasaya	Pucara	Late Sillumocco
500	Chiripa Mamani	Cusipata	
	Chiripa Llusco		Early Sillumocco
1000	Chiripa Condori	Qaluyu	
1500			

FIG. 3. Chronology of sites in the Titicaca region.

was viewed by the Inca as one of the most important of its provinces. The site of Hatuncolla was established as one of the largest provincial centers of the empire (Julien 1983: 79), and the Inca built one of its most impressive religious centers on the Island of the Sun. The Juli-Pomata region was part of Lupaqa Province. The elite of the Lupaqa state apparently enjoyed a privileged position in the imperial bureaucracy. This privilege most likely derived from an "alliance" between the Inca and the Lupaqa against their common foe, the Colla (e.g., see Cieza de León n.d.: Bk. 100).

Previous Research in the Juli Area

There has been relatively little research in the Juli area in spite of its importance in the region. The celebrated pioneer archaeologist Alfred Kidder conducted a limited reconnaissance in the northern and western Titicaca Basin in the 1940s. He discovered a number of sites with Pucara and Tiwanaku pottery on the surface. Kidder's 1943 report describes two sites that are located close to the Juli area. These sites are Asiruni and Sarapa (1943: 10), located in the Pampa Ilave several kilometers northwest of the modern town of Juli. Asiruni is described as a slight elevation of the pampa near the Ilave River. Kidder noted that a broken stela and large, cut sandstone blocks were found on the ground. These features strongly sug-

gest the existence of an important structure with a cut stone semisubterranean court. Sarapa is similar to Asiruni in having several mounds and cut sandstone blocks on the surface. The ceramic fragments associated with these sites indicate a Tiwanaku and possibly Upper Formative occupation. Asiruni and Sarapa are the southernmost Tiwanaku and possibly pre-Tiwanaku sites discussed by Kidder. Kidder never discussed Tumatamani, and we can reasonably assume that he was not aware of the site.

One extensive reconnaissance of the Lupaqa region was conducted by John Hyslop in the 1970s. Tumatamani is one of the principal sites in the Tiwanaku and Antecedents macropattern proposed by Hyslop (1976) for the Lupaqa zone. A *macropattern* is a synthesis of the general archaeological characteristics of sites of a single, long time period. Hyslop defined three of these macropatterns for the Lupaqa area. The Tiwanaku and Antecedents macropattern includes all sites of the Tiwanaku and Formative periods. This macropattern is characterized by undefended sites on low plains near the lake. Several of the larger sites of this macropattern, such as Tumatamani, have substantial corporate architecture.

The importance of the site of Tumatamani for understanding the very complex Formative and Tiwanaku period Titicaca Basin prehistory cannot be overstated. Previous research on Tumatamani (Hyslop 1976; Mujica 1985: 124-127) has indicated that many of the major ceramic styles from the Formative and Tiwanaku periods are found at

the site. Geographically, the site is located between the two traditional centers of political power in the Titicaca Basin—the northern Collao region, where Pucara developed, and the southern Pacajes zone in Bolivia. Pacajes is the ancestral home of the Tiwanaku empire. Pacajes is probably the heartland of Qeya pottery manufacture, the style associated with the immediate predecessor of the expansive Tiwanaku state. Mujica’s map (1985: 124) of Pucara site distribution includes 34 sites, ranging from Batan Urqo, near Cuzco, in the north to Tumatumani in the south. Mujica also listed 20 sites with Qeya ceramics that are distributed throughout the southern side of the basin (Mujica 1985: 127). In this map of Qeya site distribution, Tumatumani appears as the northernmost site along the southwestern edge of the lake. With one exception, Pucara and Qeya site distributions do not overlap in Mujica’s map. That one exception is Tumatumani.

The Lupaqa Project

The Lupaqa Project is a research program of systematic survey, controlled surface collections, and excavations of archaeological sites in the Lupaqa area of the Titicaca Basin. The project is headquartered in Juli, one of the major Colonial and modern towns on the Peruvian side of Lake Titicaca. Juli is located in the province of Chucuito at approximately Km 79 on the Puno–Desaguadero highway (Fig. 4). Known informally as the “Little Rome of Peru,” Juli was the center of Dominican and Jesuit activity in the region during the Colonial period. It was home to four huge churches, a fact that attests to its importance in early Colonial times. Juli is listed as a major town in the *Visita* of Garci Diez de San Miguel in 1564. It is also mentioned as a major Inca site, a fact corroborated by archaeological research (Hyslop 1976: 399; Stanish et al. 1992). Juli continues to be the judicial “capital” of the province of Chucuito. While the population of the Ilave Peninsula has grown substantially larger than Juli’s, Juli continues to be one of the most important centers in the western Titicaca region.

The geography and ecology of the Titicaca region have profoundly affected the development of political and economic systems throughout history and prehistory. The classic work of Pulgar Vidal (n.d.) divides the region into two broad ecological zones, the *puna* and the *suní*. The *suní* is located

between 3500 and 4000 meters above sea level (m.a.s.l.). The *suní* represents the upper limit of plant agriculture, while the *puna* is a grazing zone for the extensive camelid herds owned by many Titicaca Basin peoples.

The *suní* includes the lake edge and the area a few kilometers away from the lake. It is the area of greatest economic potential. Pulgar Vidal notes the rich variety of agricultural products that grow in the *suní*. These include many varieties of tubers, legumes, and chenopods (n.d.: 95–98). Not surprisingly the *suní* is the major area of human settlement today, especially at the base of the hills below 4100 m.a.s.l. Different ecological studies have suggested a more complex mosaic of resource zones other than the *suní/puna* distinction. Tosi (1960), for instance, lists eight zones for the Titicaca region, a classification based on the Holdridge system. For our purposes here, however, Pulgar Vidal’s distinction between the agricultural and pastoral zones is the one that is the most culturally relevant.

The *suní* is the region where pre-Hispanic raised fields were located (Erickson 1988: ii; Kolata et al. 1987; Smith et al. 1968). Raised fields are feasible along the lake shore and along rivers where flat topography permits. They are possible only in the low *suní* zones. Likewise, Flores Ochoa and Paz Flores (1983) have documented the use of *qocha* in the *suní* zone. These are small, water-filled depressions or lakes in the Titicaca Basin used intensively by modern farmers to grow altiplano crops. It is likely that they were used by pre-Hispanic populations as well. The lake itself provides an important additional economic resource base on a scale unique in the Andes. The highest density of Formative and Tiwanaku sites is found in the *suní* zone as well. Tumatumani is a good example of a settlement choice located to ensure access to several resource areas.

The *puna* is defined as that zone between 4000 and 4800 m.a.s.l. (Pulgar Vidal n.d.: 104). The major plant agricultural product is the potato, which can be grown throughout the *puna*. While potatoes can be grown up to the snow line (Pulgar Vidal n.d.: 111), the most optimal yields occur in the warmer *suní* zones and in the lower *puna*. Overall, by far the most important economic product of the *puna* is the camelid, particularly the llama and the alpaca. Camelids provide wool and meat and serve as pack animals. The virtually unique capacity of the Titicaca Basin to support large camelid herds has contributed to its position as a major center of civilization in the Americas.

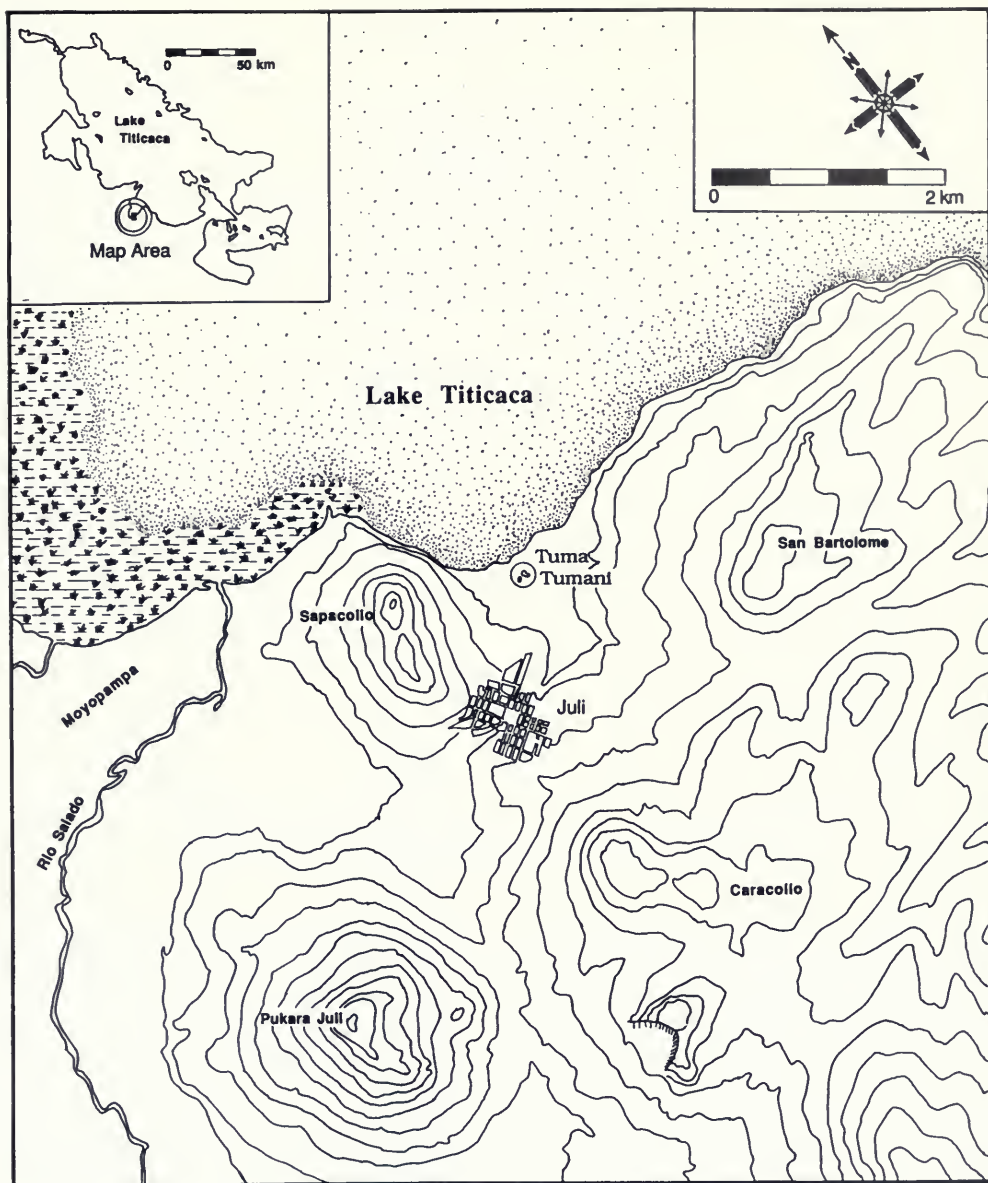


FIG. 4. Juli and the site of Tumatamani.

Research Design of the Regional Survey

Initial work on the Juli Project concentrated on ceramic analysis and reconnaissance around the Juli area. In 1990–1991, we completed a systematic survey of the area north of modern Juli to just southwest of Pomata (Fig. 2). Our survey methodology was a “full-coverage regional survey” (Fish and Kowalewski 1990: 2). We conducted a 100%

pedestrian survey of 360 km² in the Juli–Pomata region. The survey used a standard methodology for semi-arid lands. Teams of three to four archaeologists walked between 10 and 50 m apart. The distance varied according to terrain. A site was defined as any substantial concentration of artifactual remains and/or architecture. By far the most common diagnostic surface artifact was ceramic fragments. Usually, a concentration of more than five sherds per square meter over at least 25

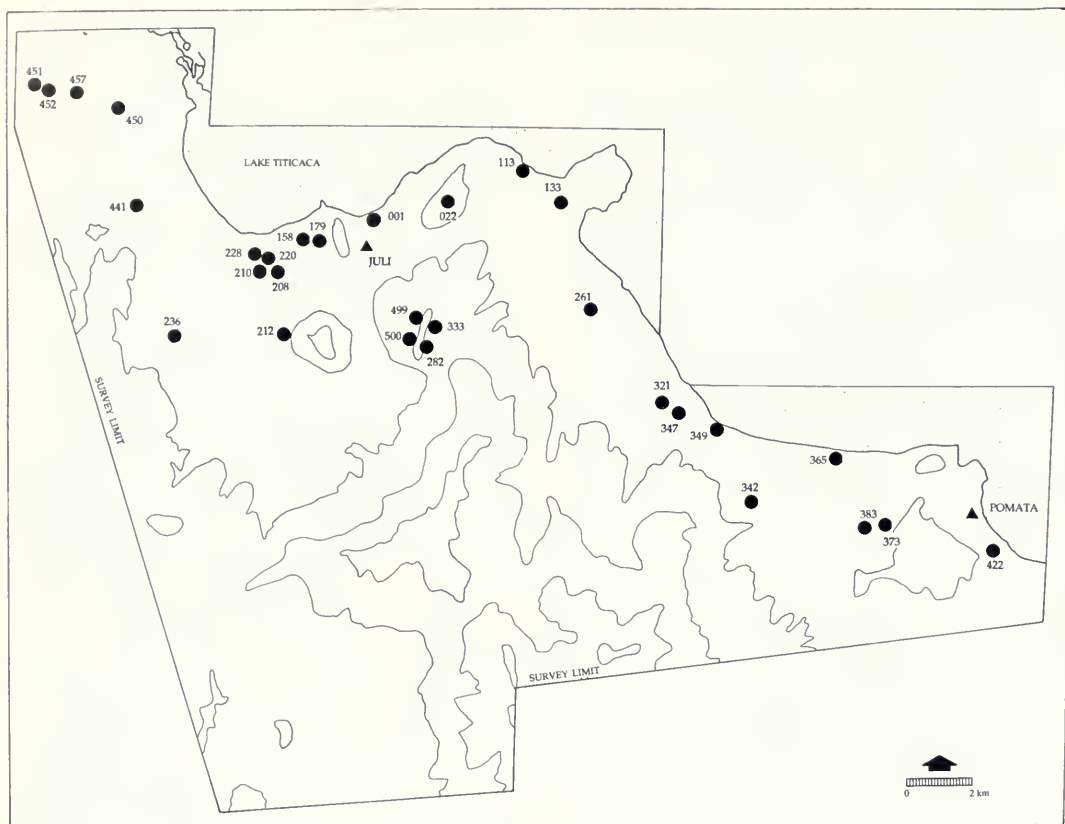


FIG. 5. Sillumocco period sites in the Juli-Pomata survey region.

sq m was necessary to establish a location as a site. Occasional and isolated occurrences of a few sherds, particularly post-Tiwanaku ones, were not treated as sites. Two loci were considered separate sites if they were separated by more than about 100 m. When a site was found, we recorded information on a standard form. If the site was small, it was uniformly surface-collected with a conscious attempt to achieve a representative sample. If there were discrete areal concentrations or functionally distinct areas in the site (e.g., cemeteries), then separate collections were made.

The research design called for a concentration of the survey along the lake shore with additional coverage in the *puna* zone away from the lake. This strategy was based partially on Hyslop's results, which showed a lakeside concentration of pre-Hispanic settlement. This strategy ensured that the study region included representative sections of both *puna* and *suni* environments (Figs. 5 and 6).

In total, we surveyed almost 40 km of lake shore

area and moved into the *puna* at distances that varied between 2 and 22 km. At present, almost 500 sites representing more than 800 occupations have been discovered. The vast majority of the sites are post-Tiwanaku in date. We were able to achieve complete coverage throughout the area, with the exception of one small military base near Pomata. The survey covered all geographic zones from lake level (3810 m.a.s.l.) to 4600 m.a.s.l. The survey also included three areas of relict raised fields. More than 70 Sillumocco and Tiwanaku occupations were discovered in the Juli-Pomata area (Figs. 5 and 6).

The Sillumocco Occupation in the Juli-Pomata Region

One major result of the Juli-Pomata survey and Tumatumani excavations is the definition of the local Formative period occupation. We have

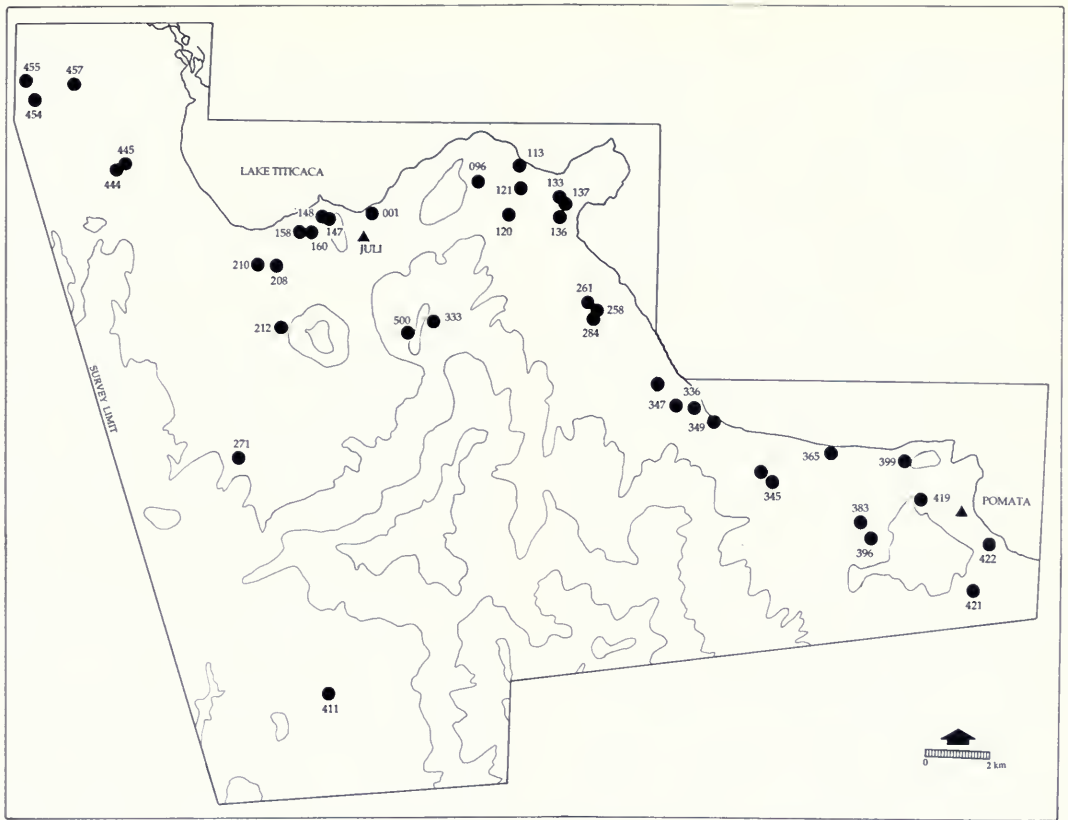


Fig. 6. Tiwanaku period sites in the Juli-Pomata survey region.

named this occupation Sillumocco, after a type site (158) located several kilometers due west of Juli (Fig. 5). The term Sillumocco refers to the associated ceramic assemblage and culture in the Juli-Pomata area during the Formative period. Its usage is similar to the use of the terms “Pucara,” “Qalzasaya,” and “Chiripa.”²

The term Sillumocco was created because the ceramic assemblage from Tumatumani and other contemporary sites shows sufficient local variation that it cannot be equated directly with any previously defined sequence. Sillumocco ceramics are clearly a local product and are distinctive enough to merit their own cultural designation.

The archaeological excavation data from Tumatumani allowed us some stratigraphic control for dividing the Sillumocco period. It is important to state at the outset that we do not have stratified midden levels. Rather, the Tumatumani excava-

tions encountered two distinct construction levels clearly separated by a prepared clay floor. The lower construction level dates to the Late Sillumocco period, ca. 200 B.C. to A.D. 400, while the upper, second construction dates to the Tiwanaku IV period, ca. A.D. 400 to 750.

The division between Early Sillumocco and Late Sillumocco results in two distinct assemblages, one fiber-tempered and one without fiber temper. The period of transition which must have existed between the two assemblages and the amount of overlap between them could not be defined with the archaeological evidence from these excavations. Some overlap does exist, particularly in the decorated wares. However, the bulk of the ceramic assemblage shows a marked change in paste composition as well as in vessel shape and finish between the two periods.

The transition between Early Sillumocco and Late Sillumocco is believed to be contemporary with the end of Chiripa Mamani and the beginning of the Tiwanaku I or Qalzasaya period. Again,

² “Pucara” is also spelled “Pukara.” “Qalzasaya” is also spelled “Kalzasaya.”

this conclusion must remain tentative since we do not know if there is an exact correlation between the Juli–Pomata area and Bolivian sequences. We see the beginning of Qalzasaya (Tiwanaku I) as later than reported by Ponce Sanginés (1981b: 137), who hinted at a date sometime between 1580 and 600 B.C. We place the beginning of Qalzasaya sometime after 300 B.C., based on an analysis of Ponce's data (1981b: 137) and Bermann's work at Lukurmata (Bermann 1990: 55).

The Early Sillumocco period spans the end of the Middle Formative and the early part of the Upper Formative. It is roughly contemporary with Late Qaluyu, Cusipata (Mujica 1987: 22), Chiripa Llusco, and Chiripa Mamani (Browman 1978b: 808–809; Mohr 1966: 163). It therefore dates to approximately 800–200 B.C. The Early Sillumocco period is characterized by fiber-tempered utilitarian wares with strong similarities to Chiripa ceramics, fiber-tempered incised and painted ceramics with similarities to Chiripa, and non-fiber-tempered (or specimens produced in a paste with very little fiber) incised and painted ceramics with similarities to Qaluyu. The Qaluyu-related ceramics can be placed in the Middle Formative, contemporary with Early Sillumocco. In fact, comparisons with similar ceramics from Chávez's Marcavalle sequence would place them at approximately 800 B.C., which probably dates the earliest occupation of most Sillumocco sites in the Juli–Pomata area.

The Late Sillumocco occupies the later part of the Upper Formative in the Juli–Pomata area. It is roughly contemporary with Classic Pucara, Qalzasaya (Tiwanaku I), and Qeya (Tiwanaku III), and dates to approximately 200 B.C. to A.D. 400. The Late Sillumocco period is characterized by sand-tempered utilitarian and decorated wares. The use of fiber temper persists in this period only on a limited scale and occurs only in minor quantities in one of the pastes, used for the manufacture of a small number of utilitarian wares and Tiwanaku IV decorated ceramics. We anticipate being able to subdivide the Late Sillumocco period in the future, since it is evident that some of the specimens assigned to this period bear more of a resemblance to Qalzasaya ceramics and some are more clearly related to the later Qeya assemblage.

The Sillumocco settlement pattern is shown in Figure 5. It is immediately apparent that the settlement is heavily concentrated on the lake shore. Few sites are as high as 4100 m, and there are no Sillumocco sites found above 4200 m in the survey area. It is significant that the largest cluster of

elite/ceremonial Sillumocco sites is on low hills in or on the periphery of the Moyopampa raised field system in the northern section of the survey (Fig. 5).

There is a distinctive site size hierarchy with sites ranging from small mounds to the large mounded site of Tumatumani (001) and the impressive terraced hill sites of Sillumocco (158) and Palermo (212). These three sites in particular are characterized by the presence of corporate architecture. These sites almost certainly represent the elite/ceremonial centers of the Sillumocco polity. It is significant that we did not find similar sites in any area outside of the Juli–Moyopampa zone, which suggests that this latter area was a regional center. It is likely that additional regional centers occur near the Ilave River and east of Pomata. This is suggested by the work of Kidder (1943), who discovered the sites of Asiruni and Sarapa on the Ilave pampa, and the work of Hyslop (1976), who reported the large site of Queñuani in the Pomata pampa. It is also possible that the sites in the Challapampa area may correspond to a regional center further east, perhaps one associated with the Queñuani site. Such propositions await future testing.

It is surprising that there are few high-altitude sites in the Sillumocco period. Excavations at the sites of Tumatumani (001) and Palermo (212) indicate heavy use of camelid meat, as evidenced by relatively large quantities of butchered bone in the middens. We can hypothesize that the pasturing of camelids did not involve any formal settlement system utilizing special activity sites. It is more likely that access to camelid herds involved informal systems of control by individual households or larger kin groups. Certainly there is no archaeological evidence of corrals or special high-puna sites involved in camelid raising.

The survey data strongly suggest that raised field agriculture was an important component of the Sillumocco economy. As we said earlier, sites cluster near the raised field section in the Moyopampa and are found along the periphery of the fields up to the northwestern end of the survey zone. The site of Palermo (212) is located directly between two aqueducts that feed the raised fields. The first substantial occupation of Palermo was in the Sillumocco period, as evidenced by analysis of data from controlled surface collections and excavations. Control of these freshwater sources may have been a major settlement determinant for Palermo, at least in the Late Sillumocco period. Raised fields

are also found in the Pomata area and were probably constructed in the Huancané zone due west of Pomata (Fig. 6). There is a substantial Sillumocco settlement in the Huancané region. The Pomata area was not adequately surveyed to determine the settlement pattern, but informal survey by one of us (Stanish) indicates that there is a significant number of Sillumocco sites in this sector.

In summary, the Sillumocco settlement pattern is characterized by a lakeside settlement focus, the absence of fortified settlements, clustering of sites near raised field areas, and a lack of any archaeologically visible formal system of camelid pasturing. The Juli area is hypothesized to be a Sillumocco regional center as represented by the sites of Tumatamani, Sillumocco, and Palermo.

The Tiwanaku Occupation in the Juli-Pomata Region

A total of 41 Tiwanaku sites were discovered in the study area (Fig. 6). Tiwanaku sites are identified by the presence of Tiwanaku pottery on the surface. Tiwanaku ceramics in the Juli-Pomata region are recognized by very distinctive pottery shapes and design motifs. Certain Tiwanaku fineware pastes are also distinctive and are probably imports into the region. The best Tiwanaku marker, however, was pottery in the form of *kero*, *tazón* (flaring-sided bowl), and incense burner shapes. We also were able to identify sites by the presence of typical Tiwanaku design motifs on *keros*, *tazones*, bottles, and jars.

Most of the Tiwanaku pottery from the study area would be classified as Tiwanaku IV or Tiwanaku V, or Classic and Decadent respectively in the traditional Bennett-Ponce sequence. Unfortunately, there is an insufficient number of decorated fragments from the survey to accurately phase the sites into Tiwanaku IV and V. The most common shapes are *keros* and *tazones*. *Keros* are found with and without bands around the body. Incense burners are also a common shape in the Tiwanaku ceramic assemblage in the region. The first manifestation of Tiwanaku influence in the region dates to the Classic phase (ca. A.D. 400–750). There are no Chiripa or early Tiwanaku (i.e., Tiwanaku I or III) sites in the region, although an exchange network that involved Chiripa finewares certainly existed. It is critical to note that the Ti-

wanaku occupation at Tumatamani, as with the other Tiwanaku sites in the Juli-Pomata area, began in the Tiwanaku IV period.

The Tiwanaku settlement pattern is shown in Figure 6. One of the most striking features of the Tiwanaku settlement pattern is its similarity to the Sillumocco one. A significant number of Sillumocco habitation sites continued to be occupied in the Tiwanaku period. Most of the sites that were abandoned were hamlets or small villages, while the large centers continued to be occupied. More than 20 new sites were founded in the Tiwanaku period, including Tumuku (121), an elite/ceremonial center located in the Kajje area between the Chocasuyu and El Molino areas. These data indicate a strong continuity between the Sillumocco and Tiwanaku period settlement patterns. It is most likely that the Tiwanaku state expanded into an already complex political and economic system dominated by the Sillumocco peoples.

Another very significant addition to the settlement pattern in the Tiwanaku period is the founding of sites south of the Moyopampa region in the *puna*. The distribution of sites 271 and 411 is suggestive of either a road or a settlement system designed to control the Pasiri region water resources. The Pasiri drainage ultimately feeds the raised field sections in Moyopampa. If these sites follow a road, it is most likely that they led to the low, swampy areas in the Pasiri region. This area is an ideal camelid grazing zone at the present time. This aspect of the Tiwanaku settlement pattern could therefore be the first indication of a formal system of camelid production in the Juli-Pomata region. It is also significant that the raised field areas continued to be utilized by the Tiwanaku peoples. In fact, the abandonment of sites 200 and 228 could have resulted from expansion of the raised field areas into these former Sillumocco habitation zones.

Tumatamani represents one of at least six major elite/ceremonial centers in the region during the Sillumocco and Tiwanaku periods. In our classification of site types (Stanish et al. 1992), Tumatamani is a classic example of a large, artificial mound with corporate construction (Type 1 site). The other elite site type (Type 3) is characterized by sunken courts on low hills with surrounding domestic terraces.

There are three Type 1 sites in the survey area—Tumatamani (001), Huaquina (210), and an unnamed site, no. 444 (Fig. 6). The sites of Asiruni and Sarapa, located just north of the Juli-Pomata

survey area and briefly described by Kidder (1943: 10), would fit into the Type 1 category as well. In our survey area, only Tumatumani and Huaquina have surface artifacts indicative of a Sillumocco period occupation. Tumatumani is therefore also significant in that it represents one of three Type 1 sites in the Juli–Pomata area and one of a few such large sites with large mounds in the lake region.

In summary, the Tiwanaku settlement pattern is characterized by a lakeside settlement focus and the absence of fortified settlements, patterns similar to the earlier Sillumocco pattern. Also like the earlier pattern, sites clustered near raised field areas. All major Sillumocco elite/ceremonial sites continued to be occupied in the Tiwanaku period. Tumatumani is a classic Type 1 mound site. It represents one of the few major elite/ceremonial settlements in the region.

Research at the Site of Tumatumani

Historical Work

Tumatumani was first reported in 1976 by John Hyslop (1976: 246) in his survey of the Lupaqa area. He reported finding a variety of pottery styles on the surface of the mounds, including fragments related to Chiripa, Qaluyu, Tiwanaku I, and Pucara. These ceramic remains were concentrated on two partially artificial mounds that rose several meters above the natural ground level.

The site sits in a low alluvial zone between the two large hills of San Bartolomé and Sapacollo that flank the modern town of Juli (Fig. 4). A small river flows through the site area and actually runs directly between the two mounds. The relatively deep soils and proximity to the lake (lake shores have slightly higher ambient temperatures and therefore slightly longer growing periods) make the site area one of the richest agricultural zones in the Juli region.

There is no surviving stone architecture on the surface of the mounds. However, the remains of several artificial platforms are clearly evident. Each of these platform faces is approximately 50 cm in height. They have been severely eroded by intensive agricultural use. Aboriginally, these platforms were considerably higher. We estimate that they were 2 m or more in antiquity.

Despite its location near modern Juli, Tuma-

tumani is relatively undisturbed and unlooted. The first 25 cm below the surface is badly disturbed from shallow agricultural plowing. One large modern house was built into the southern side of the west mound, destroying about one fifth of this mound. Also, the northern side of the west mound has been cut back for agricultural purposes. A stream cut the eastern side of the east mound, exposing a natural subsoil. Other than these disturbances, the site area is relatively intact.

Research Design at Tumatumani

The Tumatumani investigations included three principal field strategies: topographic mapping, intensive surface collections, and limited excavations. The mapping and surface collections were designed to define site limits, size, architectural and settlement complexity, architectural features, and intensity of occupation. The excavations were intended to separate major occupational periods from minor ones (given the great variety of surface ceramic types discovered by Hyslop and our team) and to help define architectural building episodes.

The entire site was mapped with a T-2 Wild theodolite. This procedure provided a detailed, 1-m contour map of the entire site area that was used in the systematic surface collection (Fig. 8) and in the location of other surface site features.

The systematic surface collection utilized an intensive (100%), aligned, systematic (every 20 m) technique with 2 × 2-m collection units. The grid was placed over the entire potential site area and beyond and can be easily located by future researchers. The point N 2000/E 2000 served as the main datum and is the highest part of the west mound. The number designation is in meters, and the grid lines are oriented 4° east of north. To locate any part on the site, one can simply go to the highest point on the west mound, orient a datum line 4° off north, and measure off in meters to the unit designation. All units are numbered at the southwest corner.

This grid system and surface collection method had been previously worked out at the large Formative and Tiwanaku site of Lukurmata in Bolivia (Stanish 1989b: 45–50). This method is characterized by a systematic, aligned sampling technique. The success of the Lukurmata research encouraged us to use a similar method at Tumatumani. In an effort to characterize the Tiwanaku and earlier occupations, all sherds iden-

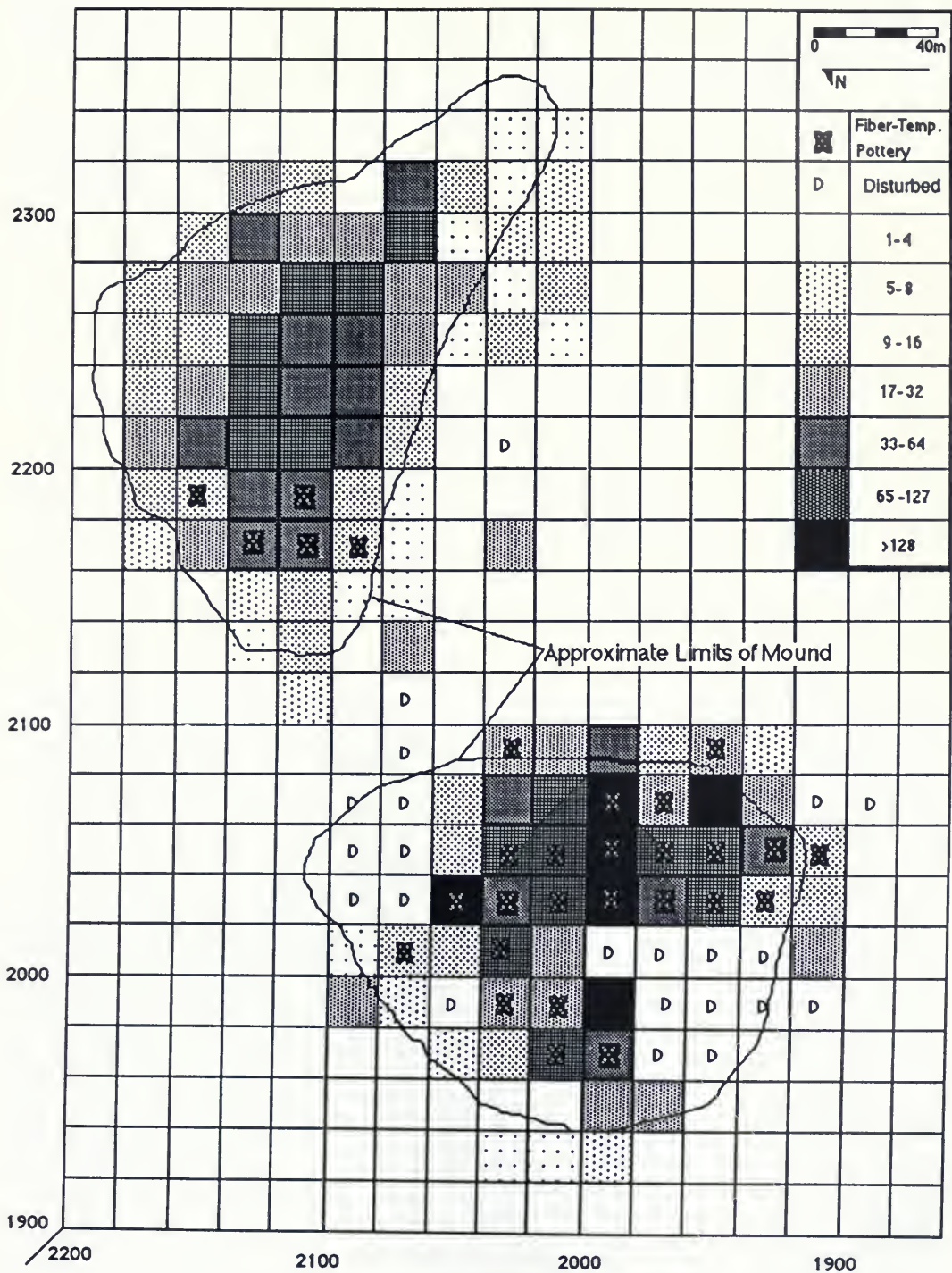


FIG. 7. Distribution of ceramics at Tumatumani.

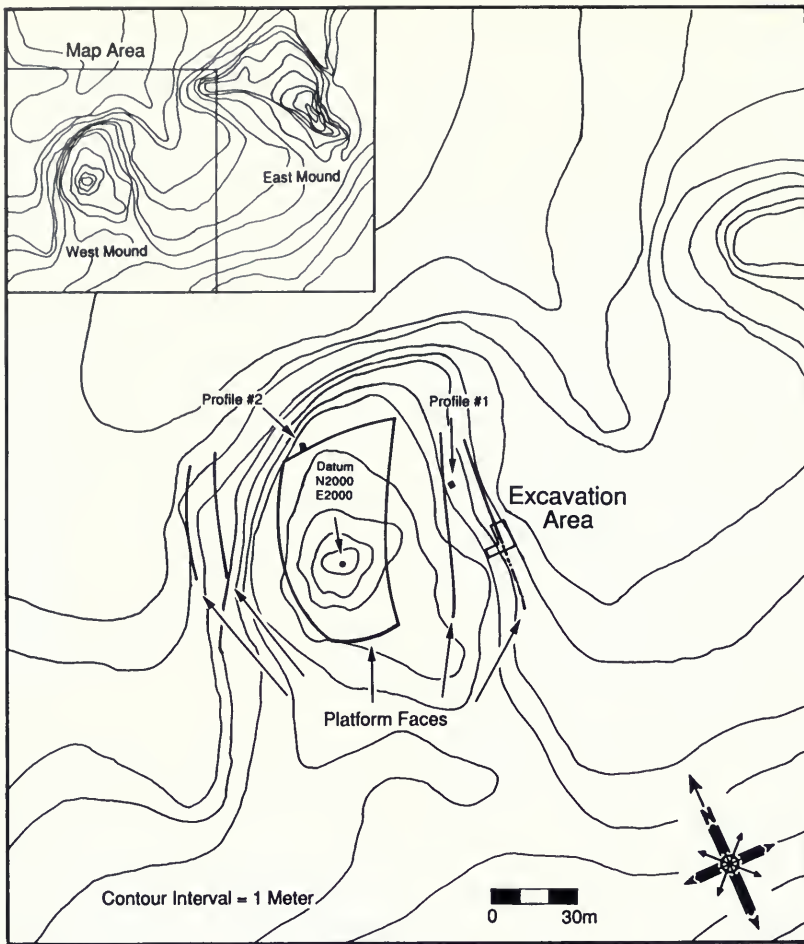


FIG. 8. Contour map of Tumatumani showing location of platform faces.

tifiable as post-Tiwanaku were removed from the unit collections and the remaining ones were counted. The density distribution (logarithmic) of this collected sample is presented in Figure 7. These results are interpreted below.

The mapping and surface work also served to identify and measure the major architectural features preserved on the site. Figure 8 is a contour map of the site, and Figure 9 is a distant view and hypothetical reconstruction of the mounds. This involved the careful measurement of existing terrace faces on the mounds and the subjective assessment of the size of the original mound areas. These reconstructions are useful for conveying the nature of the corporate architecture of the site. Of course, the aboriginal architecture is much more complex than is initially apparent from the surface.

The final field procedure utilized at Tumatumani was the excavation of a single terrace face. A total of five adjacent excavation units (2×2 m and 2×1 m) were placed in one of the lower terraces on the more densely occupied sector of the west mound. This was an area where surface collections indicated a very dense scatter of fiber-tempered sherds and other pre-Tiwanaku and Tiwanaku styles. The selection of the excavation units were therefore arbitrary, in an area of high-density surface materials.

Results and Interpretations

SURFACE MAPPING—Figure 10 is a photograph of the site from a distance. The west mound is in the center left, with the house compound built into

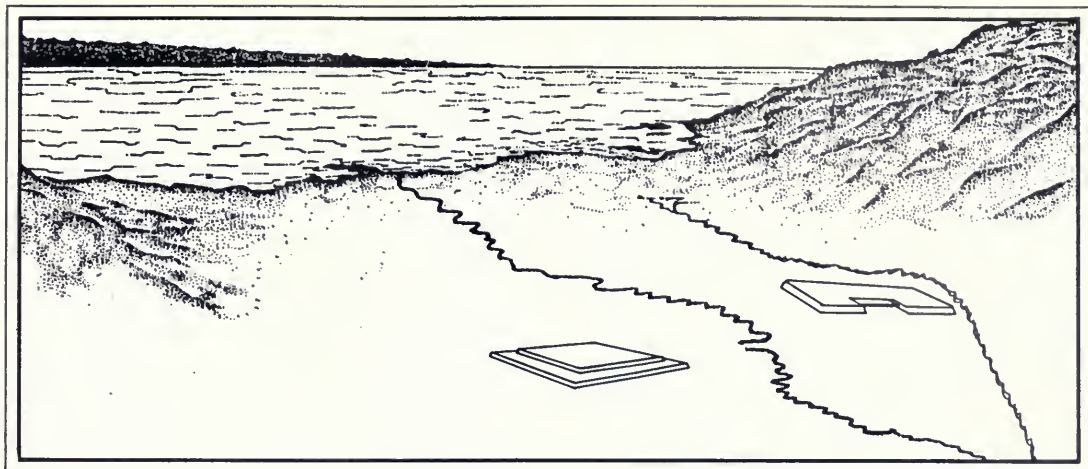


FIG. 9. Reconstruction of the site of Tumatamani.

its southern side. The east mound is directly behind and to the right of the west mound. The site is approximately 8 m above ground surface at its highest point. It is significant that the lowest area of the site is only 7 m above the level of Lake Titicaca. If the site was continuously occupied from

the Formative period to the Late Horizon, then the fact that the site is so low holds important implications for paleo-ecological reconstructions of Lake Titicaca levels. On the other hand, should good evidence indicate that the lake has indeed risen more than 7 m in some periods since the



FIG. 10. Site of Tumatamani.

Formative, then our reconstructions of the pre-Hispanic settlement dynamics would have to account for site abandonment and resettlement in areas as low as that surrounding Tumatamani. Certainly within the 20th century the lake has fluctuated at least 5 m in height.

The extant surface architecture on the site was also recorded. We measured the width and height of terraces and platforms on the mound and interpolated for areas destroyed by modern constructions. In the case of the destroyed terrace faces, we presumed that there was an architectural symmetry. This was a reasonable presumption, given other architectural reconstructions from contemporary sites in the Titicaca Basin (e.g., Chiripa as reconstructed by Conklin and Moseley [1988: 161]).

These surface data permit us to reconstruct the architecture that characterized the last major construction of the site. On the west mound two large, low platforms were constructed, with the smaller one placed on top of the larger platform to create a two-tiered “temple” mound. Each of these platforms was faced with a terrace that was most likely made of uncut fieldstones. This suggestion of stone-faced terraces is based on the discovery of an uncut stone wall in the excavations that corresponded to an earlier terrace wall construction (see Excavation Results, below). Today the terrace faces are approximately 50 cm in height, but they have been severely eroded by agricultural activities.

The east mound is dramatically different from the west mound. It is built in an elongated horseshoe or U shape with a small terraced platform between the two legs of the U. The terraced platform was probably faced with a stone wall. This we deduced from the presence of cut sandstone blocks near the site. Without excavations, however, this inference remains unproven.

We were able to locate areas on the mounds where natural subsoil was exposed on the sides. It was clear that each mound had been built on a natural hill. The aboriginal hills are characterized by a reddish yellow clay subsoil. By locating these natural surfaces or hills, we were able to determine the approximate contours of the pre-occupational natural hills. Because of the lack of disturbed areas around the mounds, these contours were too imprecise to present a profile but were sufficient for a verbal description of the quantity of artificial fill used in the site area.

It is clear that both mounds were once low natural hills that were later built up with artificial fill.

The architectural features suggested in Figure 8 represent the last stage of the corporate building projects at the site. Prior to this final construction phase there was at least one other major reconstruction episode (see Excavation Results, below). Before these formal constructions, the population most likely lived on unaltered natural hills. The east mound is largely natural except for the west leg of the horseshoe, which was built with artificial fill. In contrast, the east leg of the U-shaped mound appears to have been excavated out of an aboriginally larger hill area. This aboriginal excavation was necessary to create the desired architectural shape. The west mound was composed of artificial fill, although a substantial natural hill is evident from the distribution of subsoil sections.

Several *chulpas* or aboveground slab-cist tombs are found on the east mound. These burial features are post-Tiwanaku phenomena. All are looted and do not appear to be contemporary with the corporate architecture on the site. This we deduced from the tombs' locations either on the top and off-center on the mound or on the edge of the easternmost leg of the horseshoe. They are not found on the west mound. The *chulpas* are most likely the remains of a small post-Tiwanaku occupation. Hundreds of similar aboveground tombs are found throughout the Juli-Pomata region.

SYSTEMATIC SURFACE COLLECTIONS—The size and nature of settlement complexity of the Formative and Tiwanaku periods in the Titicaca Basin have rarely been addressed in a systematic manner. Complexity refers to differences in elite versus nonelite residences, the nature of corporate architecture, areas of economic specialization, and so on. Pucara is reported to have a habitation zone adjacent to the public architectural area on the mounds (Rowe 1963). The nature of the occupation area around the Chiripa mound has never been published, but one of us (Stanish) has observed at least three large domestic terraces below the formal mound area toward the lake. Chiripa therefore has both a section with corporate architecture in the mound area proper and a substantial area of domestic residence located directly below the mound. Little is known about the nature of residential or nonresidential occupation away from the architectural center of other sites in the region.

The Tiwanaku site of Lukurmata in Bolivia has been systematically surface-collected using the systematic, aligned sampling technique (Stanish 1989b: 45). The surface density map indicates a huge site (1.5 km²) and a substantial variation in

habitation intensity. A similar method was applied to Tumatumani. Analysis of the systematic collections from Tumatumani provides a trend surface characterization of the settlement area and beyond. The fact that the mounds were built with cultural fill certainly prejudices interpretation of these surface data, since the existence of artifacts does not necessarily indicate that residential activities took place in that collection area. On the other hand, the absence of remains is a good indication that there was no habitation or site use other than possibly agricultural use. The total distribution of the surface artifacts, therefore, serves to define the absolute limits of site activity.

Our interpretations of the surface data are that Tumatumani was a substantial site in area and intensity of occupation. The two principal habitation areas total 5.3 ha, based on ceramic and other artifact distribution data. Tumatumani is therefore the largest Type I site in the Juli-Pomata area. Each mound occupies a roughly equal area, although the west mound has a substantially greater concentration of artifacts. This probably reflects the fact that the west mound is built with a much greater quantity of artificial fill. The east mound, in contrast, more closely conforms to the natural contours of the original or natural hill.

The distribution of Early Sillumocco pottery on the mounds of Tumatumani suggests that both were occupied early and continued to be used simultaneously throughout the major occupations of the site. Since the fiber-tempered Sillumocco ceramics are associated with one of the oldest of the Formative cultures, we can conclude that the site was founded early in the Titicaca Basin sequence.

The most unexpected result of the surface investigations was the complete absence of occupational debris away from the mound areas. All residential settlement appeared to have been concentrated on the high areas; the lower sections below the mounds were virtually free of pre-Hispanic artifacts. This pattern was corroborated by the examination of several disturbed areas in these low areas. A road cuts through the site area, for instance, and exposes a 50-cm-deep section throughout its entire length. There is no midden accumulation in this exposure. Likewise, adobe bricks in a small modern structure south of the site do not have any artifacts incorporated into their clay. The bricks were made from clay obtained immediately adjacent to the structure and therefore reflect the nature of the surface and immediate

subsurface materials. In contrast to these "clean" bricks, those in other modern structures in the Juli area are full of pre-Hispanic artifacts.

The systematic surface data indicate that all occupation of the site was on the mounds proper. There is no indication whatsoever of a distinct residential or special-use occupation off the mounds. This is particularly interesting in light of the fact that the mounds were faced with stone walls. The evidence would therefore be consistent with the results from Chiripa, where residential structures were built directly on the mound both before and after the formal construction of the mound (Kidder 1956; Chávez 1988).

EXCAVATION RESULTS—Five excavation units were placed on the lower terrace face on the east side of the west mound (Fig. 11). The excavations did not reveal any undisturbed, stratified midden. Rather, we defined three major, pre-Inca occupational periods—an initial occupation plus two formal architectural reconstructions—on this terraced platform. Because of the unexpected complexity of the archaeological deposition in these units, we were able to complete only five relatively shallow units over a 2-month period. We were able to reach subsoil in one of the units. We think it likely that the depth of subsoil in the one unit is similar to that in the adjacent units.

Analysis of diagnostic ceramics in the excavation levels permitted us to date the initial occupation of the site. The detailed results of this analysis by Steadman are given in Part 2. The initial occupation is represented by Quluyu- and Chiripa-related styles that date to approximately 800 B.C. Although the Early Sillumocco ceramics were recovered from midden fill, which could have been brought from elsewhere for the construction of the platforms, the quantity of these ceramics and their extensive surface distribution at Tumatumani strongly suggest that the Early Sillumocco occupation was located at the site itself. No formal architecture associated with this Early Sillumocco occupation was found in our excavations.

The earliest formal architectural construction in this terrace area was represented by a stone-faced platform, a well-made clay floor, and several burials in or under the wall stones. The floor surface was clearly evident in the profile (denoted "intact surface" in Fig. 12) and was directly on top of the fill of the first construction. It was the same height as the top of the wall stones. The wall was used to support a platform, which in turn was constructed with a massive quantity of redeposited

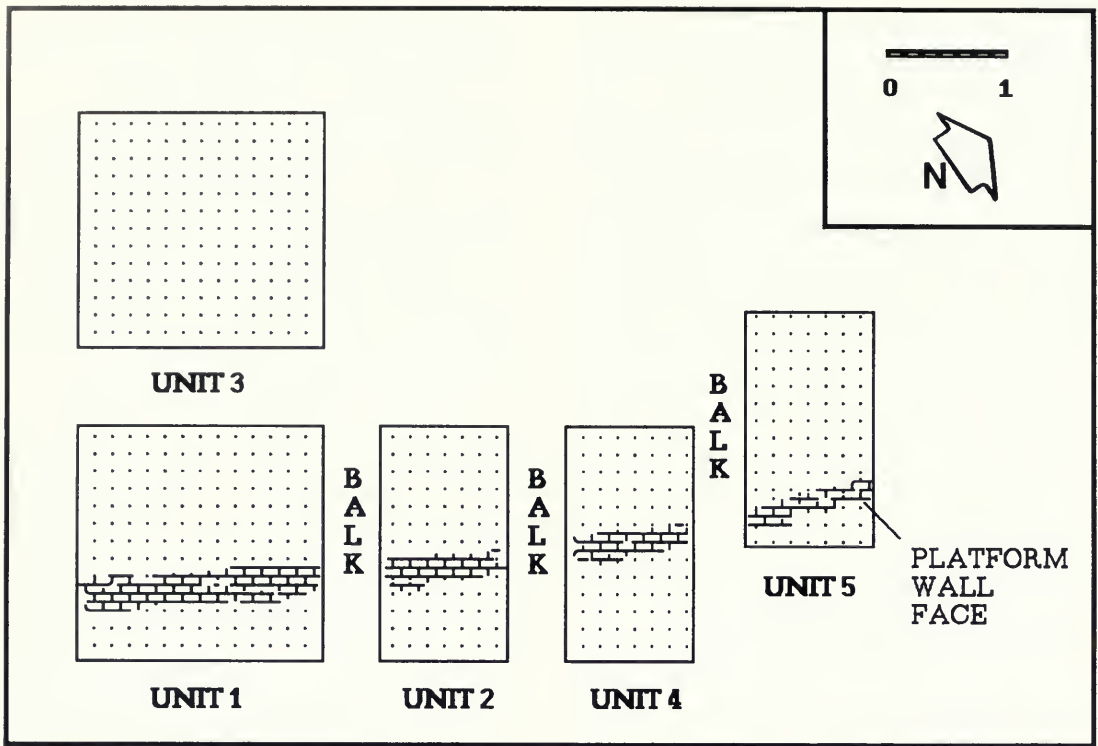


FIG. 11. Five excavation units on the west mound.

midden. In other words, the inhabitants of Tumatumani used existing midden as fill to construct a stone-faced platform surface. The platform associated with this first construction was built over a natural subsoil. This platform may have been used as a residential area, a proposition supported by the absence of remains away from the mound area proper. This construction episode is represented by the arbitrary excavation levels 9–19 in Unit 1 in Figure 12 and the natural levels below the floor in Figure 13.

At least three human burials, two of which were excavated, were found underneath and inside the stone-faced wall (Figs. 12 and 13). The two excavated burials were of an adult and child, in fetal positions, interred in unlined cists. The osteological remains were poorly preserved and could not be sexed. The bodies appeared to have been placed directly adjacent to or inside the wall. Part of the subsoil (and therefore a section below the wall itself) was excavated out to accommodate the burials. Curiously, there were no grave goods associated with the burials, a pattern that Bennett (1936: 431–436) found in many of his excavated burials at Chiripa.

The burials, wall, and underlying fill were contemporary and related to each other. The burials may have been sacrificial offerings of an adult and child at the base of a large terrace face, although this remains unproven. What is suggested from the stratigraphic relationships between the wall, subsoil, and the burials is that the bodies would have been interred before or during the construction of the wall. They could not have been placed after the wall was constructed without removing the wall stones and replacing them, an unlikely burial practice.

We can date the platform building episode by analysis of the ceramic diagnostics in the fill construction. The youngest nonintrusive sherds in the terrace provide us with a *terminus post quem* or later-than-or-equal-to date for the building period. The youngest sherds in the first constructions levels are Late Sillumocco in date. There are no unequivocal Qeya diagnostics, although the total sample is small. This indicates that the construction would have to be Late Sillumocco or post-Late Sillumocco in date. The dating of the second construction episode to the Tiwanaku IV period, however (see next paragraph), firmly places the

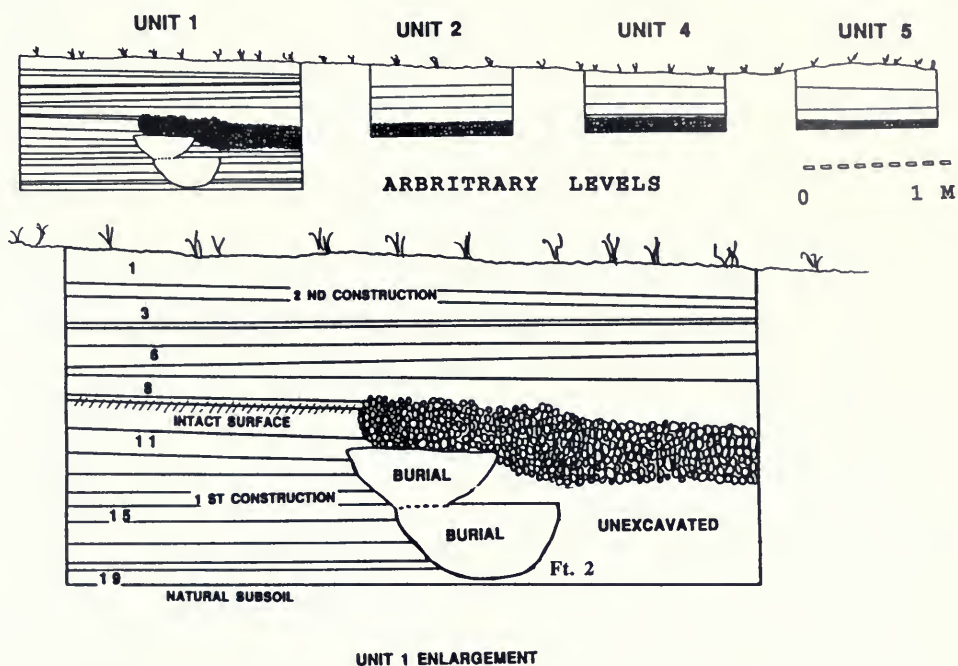


FIG. 12. Arbitrary levels of excavation units.

construction of the lower platform in Late Sillu-mocco times, between 200 B.C. and A.D. 400. The lack of Qeya diagnostics in this first construction episode may indicate that construction occurred before A.D. 200 (the oldest date for Qeya), although we refrain from making this conclusion with negative evidence.

A second, later reconstruction of the terrace was identified in the excavations. This construction was represented by younger redeposited fill over the earlier terrace wall and intact floor surface (levels 1–8 in Figure 12 and noted as “2nd construction”). Like the earlier fill episode, it was completely homogeneous, with no indication of stratified levels. This fill contained artifacts similar to the earlier construction, with the addition of Tiwanaku IV ceramics (and some Inca intrusives). The second construction must therefore be Tiwanaku IV or later in date. However, an Inca structure was uncovered in the upper levels of Unit 3 which is clearly intrusive into the second construction fill, indicating that the second construction episode predated the Late Horizon. Since no

securely identified Late Intermediate period ceramics were found at Tumatamani, either in the excavations or on the surface, the most likely date for the second construction is the Tiwanaku period, ca. A.D. 440–750.

Two profiles from disturbed areas on the upper artificial terrace were cleaned in order to compare this pattern first seen in the formal excavation areas. These terraces stratigraphically correspond to the second construction period (levels 1–9) identified in the excavations. These profiles are similar to the excavation profiles that displayed an unconsolidated fill matrix with evidence of mottled subsoil mixed with midden. The subsoil appears to have been thrown in as a basketload of clean earth. In one of the profiles we noted a lens of clean yellow subsoil that slanted down and away from the center of the mound. At Chiripa, Bennett discovered yellow and red clay floors of about the same thickness as the lens in our profile. However, the floor surface that Bennett (1936: 426) discovered sloped toward the temple at the center of the mound. Although the slopes of the clay floors at

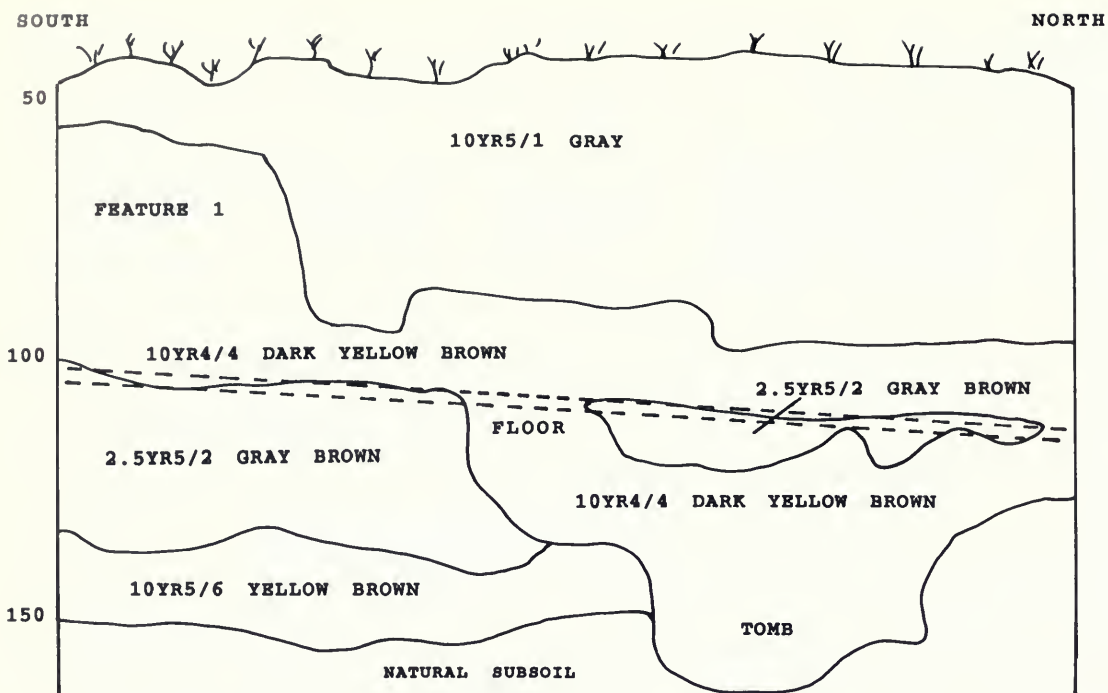


FIG. 13. Natural levels of Unit 1, west wall.

the two sites differ, it is significant that each site shares this architectural feature.

Each profile contained Sillumocco and Tiwanaku period artifacts. No certain post-Tiwanaku fragments were discovered. The pattern first seen in the excavations is corroborated by the profile cleanings: the second major occupation was characterized by a rebuilding of the terrace with extant midden from the immediate site area. The youngest nonintrusive materials in the fill were Tiwanaku, the period in which construction of the second terrace most likely took place.

The Inca intrusives found in the upper levels of Units 1 and 3 were associated with an intrusive structure found principally in Unit 3. Only a few Late Horizon fragments were found in the rest of the excavations. There was a hearth associated with a concentration of wall stones in Unit 3. Based on the presence of a number of Late Horizon ce-

ramic fragments in the upper levels, we interpreted the hearth and wall stones as a destroyed Inca period house foundation. One of the Late Horizon intrusives found in this excavation is virtually identical to a fragment illustrated by Rydén (1947: 217, Fig. 89, fragment "b") that he recovered from Palli Marca in Bolivia.

Late Horizon settlements are found throughout the Juli area (Stanish et al. 1992). The house foundation location in the excavations most likely represents a small Late Horizon occupation contemporary with the large town site of Juli (Hyslop 1976) and smaller settlements in the immediate area near the lake. The Late Horizon intrusives are restricted in area and quantity throughout the excavations. In total, the post-Tiwanaku occupations on the site are quite small compared to the Tiwanaku and Sillumocco occupations.

Part 2 Analyses of Artifacts from Tumatumani

CERAMIC ARTIFACTS

Lee Steadman

The excavation data from Tumatumani presented a number of problems and limitations for the study of ceramics from the site. Because excavations revealed only construction fill episodes, a detailed level-by-level analysis of the Tumatumani ceramics was not warranted. Instead, after an initial classification of the ceramics by level, the data were grouped into larger first construction episode and second construction episode samples for further analysis.

Only the ceramics from Unit 1 were selected for study, for this unit was the deepest, and the only unit excavated into the first construction fill. Levels 9–19, plus Feature 2 (a burial) and the fill from the lower terrace wall, compose the first construction levels of Unit 1, while the second construction fill consists of levels 2–8. Level 1, located in the modern plow zone, was not included in the sample. The total sample of body and rim sherds from the Unit 1 excavations was 4,970. Information from the Unit 1 excavations was supplemented by an analysis of selected sherds from surface collections on the west mound and the material from excavation Units 2–5. All decorated Tiwanaku and pre-Tiwanaku sherds were chosen from this sample for further analysis, as well as any undecorated sherds that supplemented the shape categories for the plainwares defined from the Unit 1 data. A total of 204 sherds was added to the excavation sample from these sources.

Based as they are on data from fill excavations, conclusions about the Tumatumani ceramic sequence rely both on internal evidence and on comparisons with other previously defined ceramic chronologies elsewhere in the Lake Titicaca Basin. Internal evidence for the ordering of the ceramic material consists of the separation that could be made between the first and second construction

episode fills. Based on the identifiable decorated sherds found in the first construction fill, the construction of the lower platform at Tumatumani was dated to the late Upper Formative period (Late Sillumocco). All ceramics found in this fill were therefore known to be late Upper Formative or earlier in date. Material found in the second construction fill, dated on the basis of identifiable sherds to the Tiwanaku period, was known to be a mix of Tiwanaku and pre-Tiwanaku ceramics. Any material found for the first time in the second construction fill and not found in the first construction sample could then be identified as pertaining specifically to the Tiwanaku period. The possibilities of error are obvious, for sampling error might result in a particular attribute not being found in the first construction levels to which it actually corresponds. Difficulties also arose in distinguishing possible cases of continuity, in which ceramics found in the first construction levels continued to be made in much the same form and finish into Tiwanaku times. Refinement of the archaeological evidence, incorporation of the surface-collected materials, and further subdivision of the larger pre- and post-Tiwanaku time frames were therefore based on visible differences within the assemblage itself and on comparisons of the Tumatumani material with other excavated Titicaca Basin ceramic chronologies.

Despite the limitations of the data, the Tumatumani sample provides a unique opportunity to study the ceramic traditions of the southwestern Titicaca Basin. Both local and imported examples of the major cultural styles of the Formative and Tiwanaku periods in the Titicaca Basin were found at the site, as were extensive samples of undecorated plainware assemblages. Because chronological statements concerning the Tumatumani sequence

TABLE 1. Total number of sherds in Unit 1 excavations.

Paste number	Level number																			Total	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Ft. 2		Wall
1	244	255	268	416	530	735	353	264	190	140	51	115	80	127	146	125	52	24	56	27	4,198
2	1	1	2	2	5	2	2	2	2	1	1	1	1	2	1	1	1	1	1	1	23
3	50	43	32	73	72	115	34	15	10	22	4	10	6	6	2	1	1	1	1	1	497
4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7
5	15	14	17	20	15	21	11	1	6	1	1	5	1	3	1	2	1	1	1	1	134
6	3	1	3	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9
7	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11
8	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
9	9	8	7	7	8	9	3	1	2	1	1	1	1	1	1	1	1	1	1	1	55
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5
13	2	1	1	3	4	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
Total	330	325	331	524	642	898	406	284	211	164	57	130	87	138	149	129	54	25	59	27	4,970

are still tentative, and because data cannot be presented in a period by period format, organization of the ceramic data proceeds with an emphasis on ceramic wares. After an initial description of the pastes and surface finish categories, the four major plainware assemblages are described. Decorated wares, drawn mostly from surface collections, are then presented and discussed in roughly chronological order.

Ceramic Pastes

Paste classification of the Tumatamani ceramics was undertaken using a 10× hand lens. Characteristics such as the density and texture of the clay body were noted, as well as the type of nonplastic inclusions present in the paste. Petrographic analyses have not been conducted on the Tumatamani material, so inclusions are described by their size, color, and luster only. Inclusions were measured with a reticule, and their shape and size are given with respect to the Wentworth scale. Inclusion density is represented by a count of the number of inclusions visible in a reticule grid of 5 × 5 mm. The inclusions of each paste are listed in descending order of abundance, and comparative information between pastes can be obtained through reference to the 5 × 5-mm figures.

All the sherds from the Tumatamani Unit 1 excavations, plus the selected surface and Units 2–5 samples, were analyzed with respect to paste and finish categories. Table 1 lists the number of sherds of each paste by level in the Unit 1 fill excavations. Table 2 summarizes each paste's percentage of the total sherd assemblage grouped into the larger first and second construction episode level divisions of this same fill. The temporal distribution of each paste, at least as found at Tumatamani, is given in Table 3. Pastes were dated based on their association with identifiable decorated ceramics and on evidence from finishes and plainware shapes. Dotted lines in Table 3 indicate uncertainties, which are explained in the text.

Only Pastes 1, 3, 5, and 9 yielded a large enough sample to merit a complete discussion of plainware vessel shapes and the finish and firing technologies particular to those shapes. The presentation of Pastes 1, 3, 5, and 9 in this section is therefore limited to a description of the paste itself and basic firing technologies. Further information on the firing and finish of vessels in these pastes can be found in the discussions of their respective

undecorated ceramics. The samples for Pastes 2, 4, 6, 7, 8, 10, 11, 12, and 13, in contrast, are smaller and consist mostly of painted or incised ceramics. There is no separate section on plainwares for these pastes; a description of their firing and finish techniques has been incorporated into the paste and finish category sections that follow, and is also summarized in Table 4.

Paste 1

The nonplastic inclusions in Paste 1 are (1) abundant opaque or matte white inclusions, sub-rounded and subangular form, medium size; (2) abundant lustrous and often translucent white inclusions, subangular form, medium size; (3) relatively abundant matte black inclusions, subangular and angular form, fine size; (4) relatively abundant gold and silver mica flakes, fine and medium size; and (5) very scarce matte red inclusions, sub-rounded form, very fine and fine size. Density is 25–30 inclusions per 5 × 5 mm.

Table 2 shows the overwhelmingly large percentage that Paste 1 commands in the total Tumatumani excavation assemblage. The manufacture of Paste 1 sherds also shows a remarkable persistence through time: sherds of this paste are found at Tumatumani dating from the Early Sillumocco through Tiwanaku periods. Paste 1 ceramics are believed to have been made locally in the Juli area. Many factors, of course, must still be examined to substantiate this conclusion. No direct evidence of pottery manufacture has been identified at Tumatumani itself. A mineralogical analysis of Paste 1, location of the clay and temper sources used in its manufacture, and more information on the geographic distribution of Paste 1 vessels would also contribute to identification of their production center. However, all information presently available points to the local manufacture of Paste 1 ceramics. This deduction is based on a number of characteristics exhibited by the Paste 1 assemblage. One is the sheer number of Paste 1 sherds found at Tumatumani, particularly the large number of utilitarian wares. Other factors being equal, bulky, low-prestige items, such as utilitarian pottery, do not travel far from their centers of production (Rice 1987: 200; Hodder 1974). Although any number of factors could result in the importation of some utilitarian vessels, the large quantity of Paste 1 utilitarian ceramics and the fact that they form the bulk of all utilitarian wares found at the site from the Upper Formative and

TABLE 2. Percentage of paste types by construction episode.

Paste number	First construction (% of total)	Second construction (% of total)
1	92.27	81.05
2	0.53	0.43
3	5.15	12.12
4	0.07	0.17
5	1.39	3.27
6	0.13	0.20
7	0.13	0.26
8		0.09
9	0.26	1.48
11		0.17
12	0.07	0.12
13		0.64
Total	100	100

Tiwanaku periods suggest that they were locally manufactured.

The variability of Paste 1 ceramics provides further evidence for local production. Technological variability is visible in the lack of standardization in Paste 1 firing practices. Paste 1 vessels show evidence of being fired in a wide variety of atmospheric conditions and temperatures, which vary within one vessel category and even within one vessel surface. Finish also takes many forms and again is not consistent even within one vessel shape category. Paste 1 itself shows more variation than any of the other pastes at Tumatumani, with more examples having a larger proportion or different sizes of various nonplastic inclusions in the paste. This lack of standardization in the Paste 1 assemblage suggests production at the household level rather than manufacture by specialized potters. Finally, the Paste 1 utilitarian wares show the widest range of shapes and vessel attributes of any of the assemblages at Tumatumani, which again suggests they were not a class of specialized imported wares but were manufactured on a local or regional basis.

Paste 1 is characterized by a predominance of matte and lustrous white inclusions. It is a compact, or often semicompact, paste with a medium texture and a porous, somewhat laminated appearance. The relatively abundant air holes are both rounded and lenticular in shape. It would appear to be a friable paste, since the break on a freshly snapped sherd is slightly jagged with a peaked, craggy look under the hand lens, but in fact it has relatively good cohesion and cannot be crumbled with a fingernail. In the large sample of

TABLE 3. Tumatumani paste distribution by period.

	Paste number												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Early Sillumocco													
Late Sillumocco													
Tiwanaku													
Late Intermediate period													
Late Horizon													

Paste 1 sherds, certain variations on the standard paste composition were found. These variations include specimens with a higher overall density of inclusions (30–35 per 5 × 5 mm), a higher density of mica with respect to other nonplastics in the paste, or sherds that have coarse rather than medium matte and lustrous white inclusions. The matte red inclusions in all Paste 1 specimens are very scarce and often are not found in the break of a small sherd.

Firing technologies for the Paste 1 wares are varied. Vessels fired in a final oxidizing atmosphere have a red-brown paste color, in the Munsell color range of 2.5YR 3.5-5/6, or 4/4. The red color of oxidized Tiwanaku and post-Tiwanaku ceramics tends to be slightly brighter than the earlier wares. Oxidation of these red-brown vessels often was not complete, leaving a gray central core. Occasionally the fired paste color of Paste 1 sherds is a uniform light brown or light brown with a darker core. Since oxidized Paste 1 sherds do achieve a red-brown color, these light brown examples are believed to be the result of incomplete oxidation rather than representative of a clay that naturally achieves a light brown color at full oxidation. Rare in the Paste 1 ceramics, although common in the fiber-tempered wares, is the production of a red-brown or light brown color on the surface of the sherd through a brief period of final oxidation, achieved by pulling the vessel from the fire to cool in the outside air. This technique produces a sharp line between the lighter interior and exterior edges and the dark core (Rye 1981: 117),

rather than the diffuse margins of the incompletely oxidized wares.

Approximately 60% of the sherds in the total Paste 1 sample have a black, dark gray, gray, or dark brown paste color. The gray and black colors were apparently achieved by firing in a final reducing atmosphere or by smudging, a procedure in which the fire is smothered with organic material at the end of the firing period, causing a deposition of carbon on the surface and in the pores of the vessel (Rice 1987: 335). The gray and dark gray wares appear to have been only superficially reduced or smudged, for the gray surface is uneven and rarely penetrates the entire vessel; more common is a red-brown core with darker interior and exterior edges. Frequently these edges are so thin as to appear as gray or dark gray “rinds” on an otherwise red-brown paste. The blackwares, with their deep black surfaces, were almost certainly intentionally smudged, and the black color is usually found throughout the entire sherd cross-section. The uniformly dark brown examples could be the result of smudging or incomplete oxidation; refiring tests would need to be undertaken to determine this. Sherds suggesting the use of both techniques have been found in the sample. In general, there is a notable lack of standardization in the Paste 1 firing, with many different techniques used, even within one vessel category. Variations on a single sherd, where only the interior or exterior of a vessel is reduced or incompletely oxidized and the other face is oxidized, are also common.

Paste 2

The nonplastic inclusions in Paste 2 consist of (1) abundant matte white inclusions, subrounded and subangular form, fine size; (2) abundant translucent and lustrous white inclusions, subrounded and subangular form, fine size; (3) relatively abundant matte black inclusions, subangular form, very fine and fine size; (4) relatively abundant gold and silver mica flakes, very fine and fine size; and (5) very scarce matte red inclusions, subrounded form, very fine and fine size. Density is 20–25 inclusions per 5×5 mm.

Paste 2 is a finer version of Paste 1. It has the same type of inclusions occurring in the same proportional mix, but of considerably smaller size. The paste is compact and fine-textured. The break of a freshly snapped sherd is smooth, and the few air holes visible are round in shape. Most of the Paste 2 examples are oxidized to a red-brown, incompletely oxidized with a gray core, or incompletely oxidized to a light brown, in the same range of colors as the Paste 1 ceramics. Reduction or smudging is very rare in firing, and except for one example of a Tiwanaku black *kero* rim, is always superficial. Almost all Paste 2 sherds are from decorated or finely finished vessels and are burnished on both sides to a medium or high luster, mostly with a fine category 7 burnish. Monochrome-slipped wares are predominantly red. Only Late Sillumocco (Figs. 127, 153–154) and Tiwanaku Paste 2 sherds have been found, with no examples known from the Early Sillumocco or post-Tiwanaku periods. Because Paste 2 is so similar to Paste 1, and because macroscopic examination suggests that the clay and temper used to make this paste were taken from the same sources as Paste 1, Paste 2 ceramics are also believed to have been manufactured locally in the Juli area.

Paste 3

Nonplastic inclusions in Paste 3 are (1) abundant matte white inclusions, subangular and subrounded form, fine and medium size; (2) scarce matte black inclusions, subrounded form, fine size; (3) very scarce lustrous white inclusions, subangular and subrounded form, medium size; (4) very scarce matte red inclusions, subrounded form, fine size; and (5) very scarce silver and gold mica flakes, fine size. Density is 30–35 inclusions per 5×5 mm.

Paste 3 is characterized by an abundance of matte

white inclusions. These are visible to the naked eye as dense white grains in the sherd cross-section. It is a compact and medium-textured paste. The break is even, without the friable appearance of Paste 1. Air holes tend to be round rather than laminated. Paste 3 is fairly standard in composition, and only one variation, containing fine matte white inclusions rather than medium, was found to occur.

Slightly more than half of all Paste 3 sherds were fired in an oxidizing atmosphere, resulting in a red-brown paste with a value of 2.5YR 4/6–7. Tiwanaku period oxidized wares tend to be of a brighter red or orange color, closer to 10R 4/8 or 2.5YR 5/8. Incompletely oxidized Paste 3 sherds have a brown, orange-brown, or gray core with red-brown or light brown edges, or are a uniform light brown or orange-brown (5YR 5–6/5, 7.5YR 5.5/4 or 6/6). Only a very small number of Paste 3 sherds have cooled red-brown or light brown surfaces. Almost all diagnostic rim and decorated Paste 3 sherds are oxidized or incompletely oxidized. Incompletely oxidized jars, bowls, and Tiwanaku period wares tend to have dark cores, while incompletely oxidized decorated Late Sillumocco ceramics are more likely to be a uniform light brown. Approximately 47% of Paste 3 sherds have pastes with dark brown or gray interior and exterior edges and red-brown, orange-brown, or brown cores. Rarely does a uniform gray paste occur. Deep black exterior surfaces and uniform black pastes, common in the Paste 1 wares, are not found in Paste 3.

Paste 3 is the second most commonly occurring paste at Tumatamani, forming 5% of the sample in the first construction episode fill and 12% in the second construction episode fill. Paste 3 ceramics found at Tumatamani date from the Late Sillumocco and Tiwanaku periods; diagnostic sherds include a small selection of Late Sillumocco and Tiwanaku utilitarian shapes and Late Sillumocco polychrome painted and incised specimens. Given the small overall percentage of Paste 3 in the total Tumatamani sample, particularly as contrasted with the Paste 1 figures, one can hypothesize either that these vessels were made elsewhere and arrived at Tumatamani only in limited quantities, or that they were manufactured locally on a small scale and only for certain vessel shapes. However, the fundamental difference in the nonplastic inclusions of Paste 3 from the locally made Paste 1 wares, as well as the difference in rim shapes, points more to a nonlocal origin, as yet unidentified. It is unlikely that the manufacturing center for Paste

3 ceramics was located a great distance from the Juli area, however, since undecorated utilitarian jars and bowls did make their way to the site, and Paste 3 is referred to in the remainder of this report as a semilocal paste.

Paste 4

Nonplastic inclusions in Paste 4 consist of (1) abundant matte black inclusions, angular and subangular form, medium and some coarse size; (2) relatively abundant matte white inclusions, subrounded and subangular form, medium size; (3) relatively abundant lustrous white inclusions, subrounded and subangular form, medium size; and (4) very scarce mica flakes, silver only, very fine size. Density is 30–35 inclusions per 5×5 mm.

Paste 4 is distinguished by a predominance of angular matte black inclusions. It is a compact, medium-textured paste. The break is slightly irregular with a peaked appearance but cannot be chipped or crumbled with a fingernail. Air holes are both round and laminated, although relatively few. In overall appearance the texture of this paste resembles that of Paste 1. Firing was most commonly in an oxidizing atmosphere, producing a red-brown color in the Munsell range 2.5YR 3-4/5-6, although superficial dark brown smudging also occurs. Body sherds are all unslipped. Diagnostic Paste 4 sherds are few and include only a painted Qaluyu-related rim (Fig. 104) and a light brown-slipped jar neck with an appliqué incised fillet located just below the rim (Fig. 14). This decorative technique is considerably different from the fillets on Pastes 1 and 3 jars, which occur at the joint between neck and body. The small number of Paste 4 sherds found at Tumatamani, combined with this difference in jar decoration, suggests a non-local origin for this paste. Little else can be said about Paste 4 at the present time. Its existence in the Early Sillumocco period is evidenced by the Qaluyu rim, while the three body sherds with Tiwanaku and post-Tiwanaku finish category 11 surfaces (see Table 4) seem to indicate a long period of production. Any conclusions based on three body sherds must be tentative, and a larger sample of this paste type is needed before further analysis can be made.

Paste 5

Nonplastic inclusions in this paste are (1) abundant matte white inclusions, subrounded and sub-

angular form, medium and occasionally coarse size; (2) abundant lustrous and translucent white inclusions, subangular form, medium and occasionally coarse size; (3) relatively abundant matte black inclusions, subangular and angular form, fine size; (4) relatively abundant gold and silver mica flakes, fine and medium size; (5) relatively abundant fiber fragments; and (6) very scarce matte red inclusions, subrounded form, fine and medium size. Density is 25–30 inclusions per 5×5 mm.

Pastes 5 through 9 are the fiber-tempered pastes at Tumatamani. All of the fiber-tempered pastes, with the exception of Paste 9, have counterparts in the non-fiber-tempered group: i.e., the characteristics of paste texture and nonplastic inclusions are virtually identical, with the differences occurring only in the presence or absence of organic temper. This similarity suggests that these pastes were manufactured in the same general region as their non-fiber-tempered equivalents, although this cannot be proved with the data available. Paste 5, because of the marked similarity of its clay body and nonorganic temper to those features of Paste 1, is also believed to have been manufactured in the Juli area. It shows the same persistence through time, a numerical advantage over the other fiber-tempered pastes, particularly in utilitarian ceramics, and the same variability in vessel shapes and finishes that Paste 1 demonstrated in the non-fiber-tempered group. In addition, one category of Paste 5 undecorated ceramics was found to be virtually identical in shape and finish to contemporary Paste 1 utilitarian wares.

Paste 5 has the same characteristically abundant matte and translucent white inclusions as Paste 1. It is a semicompact, medium-textured paste with a tendency toward laminated fractures. The break is slightly jagged and somewhat friable, and can be chipped with a fingernail. The fiber in Paste 5, as in all the fiber-tempered pastes described here, is represented by long narrow voids, which in many cases still bear the impressions of the grass segments once present in the unfired paste. These fiber voids appear in cross-section in preferred orientation, parallel to the surface of the sherd. Paste 5 was used in the Early Sillumocco period for the production of Chiripa-style incised and painted ceramics as well as monochrome-slipped jars and bowls. Most Paste 5 sherds of this time period have a red-brown or light brown surface color, usually achieved through cooling of the vessel and leaving a gray core, although incompletely oxidized examples are also found. Reduced or smudged wares have light brown or brown pastes

TABLE 4. Finish categories in Unit 1 excavations, by construction episode.

Paste number	Construction episode	Finish category										Total %	Total number of sherds		
		1	2	3	4	5	6	7	8	9	10			11	12
1	1st	16.5	1.3	15.1	7.4	38.7	21.0							100.0	1,359
	2nd	21.4	0.6	2.3	2.0	35.1	25.9	0.7			1.7	7.9	2.4	100.0	2,763
2	1st					25.0	37.5	37.5						100.0	8
	2nd	6.7	6.7			13.3	6.7	40.0			6.7	20.0		100.1	15
3	1st	37.7	3.9	2.6		9.1	3.9	3.9		38.9				100.0	77
	2nd	44.5	0.5	0.2		18.4	0.5	1.0		23.6	0.7	10.5		99.9	407
4	1st	100.0												100.0	1
	2nd	16.7				33.3						50.0		100.0	6
5	1st	23.8				28.6	9.5		38.1					100.0	21
	2nd	4.5				12.5	1.8		77.7			3.6		100.1	112
6	1st								100.0					100.0	2
	2nd					14.3			85.7					100.0	7
7	1st	50.0				50.0								100.0	2
	2nd					22.2			77.8					100.0	9
8	1st													100.0	0
	2nd								100.0					100.0	3
9	1st								100.0					100.0	2
	2nd						2.0		98.0					100.0	51
11	1st													100.0	0
	2nd					40.0				40.0	20.0			100.0	5
12	1st					100.0								100.0	1
	2nd									75.0	25.0			100.0	4
13	1st													100.0	0
	2nd	4.8				9.5	4.8	19.0			57.1	4.8		100.0	21

with dark brown or gray interior and exterior edges and cores.

A significant variation on the standard Paste 5 is a paste that, although the same in all other respects, contains a smaller quantity of fiber temper. No fiber voids are visible on the surface of the sherds, and without careful examination of the paste with a hand lens the pieces often appear to be manufactured from Paste 1. This reduced-fiber version of Paste 5 forms 25% of the total Paste 5 sample. Firing technologies are the same as for the Paste 1 wares, with a roughly equal distribution between reduced and oxidized firing, the former producing red-brown pastes with black interior and exterior edges, the latter producing red-brown or light brown pastes, red-brown pastes with brown cores, or pastes with cooled red-brown edges. In contrast to the standard Paste 5 sherds, which are all finished with burnishes from the exclusively fiber-tempered finish category 8, the reduced-fiber sherds have category 1, 5, 6, and 11 finishes, finishes found more commonly on the non-fiber-tempered pastes. Production of this reduced-fiber version of Paste 5 began in the Early Sillumocco

period. Its use at this time was restricted to a small number of Qaluyu-style ceramics, and it was produced alongside the more commonly found high-fiber version of Paste 5 in this period. Although production of the high-fiber version apparently ceased at the end of the Early Sillumocco period, the reduced-fiber version of this paste continued to be used through Late Sillumocco times in the production of domestic wares, and into the Tiwanaku occupation of the site for the manufacture of polychrome Tiwanaku ceramics.

Paste 6

The nonplastic inclusions of this paste are (1) abundant matte white inclusions, subrounded and subangular form, fine size; (2) abundant translucent white inclusions, subangular and subrounded form, fine size; (3) relatively abundant matte black inclusions, subrounded form, very fine and fine size; (4) relatively abundant gold and silver mica flakes, very fine and fine size; (5) scarce fiber fragments; and (6) very scarce matte red inclusions,

subangular form, fine size. Density is 20–25 inclusions per 5×5 mm.

Paste 6 is best described as a Paste 2 with fiber temper. It is a compact, fine-textured paste. The break is smooth and the air holes tend to be round and few in number. The quantity of fiber itself is relatively small. Firing techniques for Paste 6 included both reduction or smudging, to produce black and dark brown pastes, and cooling, to produce pastes with dark cores and sharp red-brown edges. Decorated wares were generally cooled. No diagnostic sherds that could be identified as Paste 6 domestic wares have been found; like Paste 2, Paste 6 appears to have been used more often for the production of fancy or decorated ceramics. All sherds are burnished, and Paste 6, of all the fiber-tempered pastes, has the highest percentage of sherds burnished on both sides. The majority of pieces are slipped dark red or brown (7.5R 3/4-7, 10R 3/6, 5YR 3/3), and the total number of sherds is predictably low.

Paste 6 is the last of the pastes believed to have been manufactured in the Juli area, although neither overall numbers nor variety and quantity of utilitarian wares can be used to support this conclusion. As for Paste 2, the inclusion of Paste 6 in the 1/2/5/6 local group of pastes is based on the similarities of its clay body and nonplastic inclusions to other pastes in the group, which suggests that the raw materials were obtained from the same source and that the pottery was therefore manufactured in the same production area. The manufacture of Paste 6 appears to have been limited to the Early Sillumocco period; of the three diagnostic decorated sherds found, one is a local version of a Qaluyu painted type (Fig. 103) and the remaining two have Chiripa-related incised or yellow-on-red painted decoration (Figs. 113, 118).

Paste 7

Nonplastic inclusions found in Paste 7 are (1) abundant matte white inclusions, subangular and subrounded form, fine and medium size; (2) relatively abundant lustrous white inclusions, subangular and subrounded form, medium size; (3) scarce matte black inclusions, subrounded form, fine size; (4) scarce fiber fragments; (5) very scarce matte red inclusions, subrounded form, fine size; and (6) very scarce gold and silver mica flakes, very fine and fine size. Density is 30–35 inclusions per 5×5 mm.

Paste 7 is very similar to Paste 3, having the

same abundant white inclusions visible to the naked eye. It differs only in the addition of fiber and in the higher quantity of lustrous white inclusions in relation to the other nonplastics. It is a compact and medium-textured paste. The break is even, with only a few small, round air holes. Firing is usually reduced or smudged, producing black or dark brown paste colors; only a few of the Paste 7 examples have cooled red-brown edges. Most pieces are burnished, but a higher percentage of sherds than in Paste 6 or 9 are burnished on one side only. About half the sample is slipped in red (10R 4/6) or red-brown (2.5YR 4/6) tones; brown slips are rare. Undecorated or monochrome-slipped Paste 7 ceramics found at Tumatamani include only four rims representing two forms: a jar with a straight-sided, slightly everted neck (Figs. 15, 16), and a constricted-neck olla shape (Fig. 17). The only decorated sherd is a fragment of a ceramic tube, illustrated in Figure 128 and discussed in a later section. Both the undecorated rims and the ceramic tube fragment can be related to Chiripa ceramics. The production of Paste 7 therefore appears to be limited to the Early Sillumocco period exclusively. Paste 7 is probably not a local paste but, as for Paste 3, the small number of Paste 7 utilitarian shapes found at Tumatamani indicates that their center of production was probably not far from the Juli area.

Paste 8

Characteristic inclusions of Paste 8 are (1) abundant matte black inclusions, subangular and angular form, medium and coarse size; (2) relatively abundant matte white inclusions, subrounded and subangular form, medium size; (3) scarce lustrous white inclusions, subrounded and subangular form, medium size; and (4) scarce fiber fragments. Density is 25–30 inclusions per 5×5 mm.

Paste 8, like Paste 4, has a noticeable predominance of angular matte black inclusions. It is semicompact and medium textured. The break is irregular, with a peaked appearance, and can be chipped with a fingernail. Air holes are fairly numerous and round in shape. The paste has no mica. Paste 8 is extremely rare at Tumatamani and is presumably nonlocal. Only three body sherds were found. These all have dark brown pastes and are burnished on one or both sides; two of the three specimens are slipped brown (7.5YR 5/3). Since no decorated or diagnostic sherds were found in the Paste 8 sample, the inclusion of this paste in

the Early Sillumocco period (Table 3) is based solely on the attribute of fiber temper, which it shares with the other, more securely dated Early Sillumocco fiber-tempered pastes from the site.

Paste 9

Paste 9 nonplastic inclusions are (1) abundant matte white inclusions, subrounded, subangular and angular form, fine, medium, and coarse size; (2) relatively abundant lustrous white inclusions, subangular form, medium size; (3) relatively abundant fiber fragments; (4) scarce matte black inclusions, subangular form, fine size; and (5) very scarce matte red inclusions, subangular and subrounded form, medium size. Density is 20–25 inclusions per 5×5 mm.

Paste 9 is defined by its characteristic chunky white matte inclusions, plainly visible to the naked eye. The three size categories of these inclusions are found in equal proportions in the paste. Paste 9 is semicompact and of medium texture. The break is jagged, with a peaked appearance, and can be chipped with a fingernail. Air holes are fairly abundant and round in shape. Notably, the paste contains no mica.

The fired paste color of Paste 9 vessels is divided about equally between reduced or smudged dark browns or blacks and dark cores with cooled red-brown or light brown edges. A small number of incompletely oxidized sherds with red-brown pastes and dark cores were found as well. Decorated ceramics all have red-brown surfaces, achieved either by cooling or by incomplete oxidation. The majority of sherds are burnished on one or both sides. Paste 9 sherds were found in sufficient quantities at Tumatamani to reflect at least part of the total Paste 9 ceramic assemblage, and both jars and open bowls, as well as Chiripa-style yellow-on-red and incised wares, were manufactured. No post-Early Sillumocco period ceramics appear to have been made. Paste 9 has no non-fiber-tempered counterpart in the Tumatamani pastes. Because of the fundamental difference of its nonplastic inclusions from the Pastes 1/2/5/6 group, it is unlikely that Paste 9 was made locally. However, it does not appear to be an imported paste from the Chiripa area; Paste 9 Chiripa-style specimens actually bear less resemblance to the type-site Chiripa ceramics than do the locally made Paste 5 and Paste 6 examples. As for Pastes 3 and 7, the number of Paste 9 utilitarian vessels found at Tumatamani suggests that its cen-

ter of production lay not far from the local production area for the site.

Paste 10

Paste 10 inclusions are (1) relatively abundant matte white inclusions, subrounded and subangular form, very fine, fine, and occasionally medium size; and (2) scarce matte black inclusions, subangular form, very fine size. Density is 20 inclusions per 5×5 mm.

Paste 10 is a dense, very fine-textured paste. In cross-section, portions of the clay body have the appearance of being sintered or melted together. Paste 10 is the only paste with this characteristic found at Tumatamani. The break of a snapped sherd is even, with a very few, small, laminate air holes visible. Paste 10 sherds are rarely completely oxidized; more common is an oxidized orange-red (2.5YR 5/7-8) with a light gray or brown core, or an oxidized exterior and reduced light gray interior. This reduced edge can comprise up to half the cross-section of the sherd, in contrast to the thinner interior or exterior edges common to the other pastes at Tumatamani. No Paste 10 specimens were found in the Unit 1 excavations, so that the paste does not appear in Tables 1 or 2. Specimens are from the other excavation units (all in second construction levels) and from the surface. The Paste 10 specimens are all decorated and burnished and form a small homogeneous stylistic group within the total Tumatamani assemblage that can be related to the Qeya (Tiwanaku III or Early Tiahuanaco) painted ceramic tradition. Paste 10 is practically identical to the pastes of Tiwanaku sherds from the site of Tiwanaku itself. Differences lie in the fact that the Tiwanaku pastes have an even denser, more sintered look, tend to be fired to a more brick red color, and have a slightly higher quantity of temper, although composed of the same matte black and white inclusions as Paste 10. It is consequently believed that Paste 10 was imported into Tumatamani, probably from somewhere near Tiwanaku, during a short time in the later Qeya period.

Paste 11

Paste 11 inclusions are (1) relatively abundant lustrous white inclusions, subrounded and subangular form, very fine size, occasionally fine; (2) relatively abundant matte black inclusions, sub-

rounded form, very fine size; (3) relatively abundant matte red inclusions, subrounded and subangular form, very fine size, occasionally fine; and (4) very scarce mica flakes, silver only, very fine size. Density is 20 inclusions per 5×5 mm.

Paste 11 is a compact to dense paste with a fine texture. The red, white, and black inclusions are found in equal proportions and are fairly dense, but their fine size makes them difficult to see with the naked eye. The break is slightly irregular, somewhat similar to Paste 2, with a medium quantity of very small, round air holes. Paste 11 sherds are fired to a buff or light brown color (7.5YR 6-7/4). Most are burnished on the exterior or both faces, although wiped and smoothed sherds also occur. Paste 11 dates to the Late Horizon, and all diagnostic Paste 11 sherds are decorated with standard Inca motifs such as fields of black triangles and fern designs. Shapes include a shallow bowl with a thinned rim and decorated interior, a bowl with a direct rim and convex profile, and fragments of "aryballus" jar necks. The center of production of Paste 11, as well as of Pastes 12 and 13, is presently unknown. The sample of these sherds at Tumatumani is small and the post-Tiwanaku occupation of the site brief and too little studied to formulate conclusions at the present time.

Paste 12

Nonplastic inclusions in Paste 12 are (1) scarce matte white inclusions, subangular form, very fine size; (2) scarce lustrous white inclusions, subangular form, very fine and occasionally fine size; (3) scarce matte black inclusions, subangular form, very fine size; (4) scarce matte red inclusions, subangular form, very fine and occasionally fine size; and (5) scarce mica flakes, silver only, very fine size. Density is 10 inclusions per 5×5 mm.

Paste 12 is a dense paste with a very fine texture. In appearance it looks something like fired silt. Inclusions in this paste are very few and difficult to find, even with a hand lens. The break is smooth, and the air holes, which are both round and laminate, are small and very few in number. The fired paste color is buff or soft brown (7.5YR 5-5.5/4). Burnishing is generally on the exterior only, with a wiped or smoothed interior. Slipping occurs only in a thin, very dark brown color that does not cover the surface of the sherd completely. None of the specimens are decorated. Of the five Paste 12 sherds found, two can be pieced together, and

at least two of the others appear to come from the same vessel, a bowl form with a direct rim and convex profile similar to the examples known from Paste 11. This form suggests that Paste 12 is probably also Late Horizon in date.

Paste 13

Inclusions in Paste 13 are (1) relatively abundant matte grayish white inclusions, subrounded form, fine and occasionally medium size; (2) relatively abundant matte pinkish white inclusions, subrounded form, fine size; (3) scarce matte black inclusions, subangular form, very fine size; and (4) very scarce mica flakes, silver only, fine and very fine size. Density is 20 inclusions per 5×5 mm.

Paste 13 is a compact, medium- to fine-textured paste. The break is only slightly irregular with a somewhat peaked appearance. Air holes are round or laminate, small, and very few in number. The paste is characterized by its predominantly grayish and pinkish white inclusions which, because of their dull appearance, do not stand out to the naked eye as do the white inclusions of the other paste groups. Also distinguishing Paste 13 is its distinctive oxidized fired color, redder than the other pastes at Tumatumani and falling in the range of 10R 4/6-8 and 5/6-8. Although most specimens are completely oxidized, some have an incompletely oxidized light gray or grayish brown core. Very rarely a superficial smudging producing a brown interior and/or exterior edge is found. Paste 13 sherds occur in small quantities in most of the wiped and burnished finish categories at Tumatumani, but more than half of the sample is found in the late finish category 10. Most sherds are burnished on the exterior or on both faces; a minority are smoothed, wiped, or burnished on the interior only. Slipping is exclusively red, the colors 7.5R 3.5/6 and 10R 3.5/6 being the most popular.

Diagnostic sherds in Paste 13 include two Tiwanaku decorated specimens (Figs. 160, 161), and body sherds with Late Horizon Inca fern motif designs. The remainder of the sample appears to also contain specimens from the Late Intermediate period. Like the Paste 12 ceramics, these Paste 13 sherds are undecorated and cannot be easily compared with other ceramics in the Titicaca Basin. Nor can they be compared locally, since they bear little relation to the Late Intermediate period Pukarani wares defined from the site of Pucara Juli, only 4 km from Tumatumani (de la Vega 1990). However, both Late Horizon bowls with interiorly beveled rims and the characteristic Late Inter-

mediate period straight-walled bowls with a direct rim (Julien 1983: 153) were found in the assemblage, suggesting that the production of Paste 13 wares was continuous from Tiwanaku through to the Late Horizon.

Since this report focuses on the earlier period of occupation at Tumatumani, before and during the time that the platform terraces were built, the Late Intermediate period and Late Horizon Pastes 11, 12, and 13 sherds will not be discussed further. Of interest, however, no Late Intermediate period Pukarani domestic or decorated wares were found at the site in either the excavations or the surface collections. The only Late Intermediate period sherds that do occur at Tumatumani are those few Paste 13 sherds that may date to this time period. It appears that there was a hiatus in the occupation of Tumatumani during most of the Late Intermediate period, when settlements moved to higher hilltop or hillside locations. Reoccupation of the site occurred on a limited scale in the Late Horizon, as evidenced by the Inca domestic structure found in the upper levels of Unit 3. The presence of Pastes 11, 12, and 13 sherds in the second construction levels of Unit 1 (see Table 1) is troublesome, given the hypothesized Tiwanaku date of this construction episode. However, these sherds occur in sufficiently small quantities that we are presently attributing their existence to intrusions from the Late Horizon occupation of the site (especially because Unit 1 is located adjacent to Unit 3) or to errors that may have occurred during sifting, which was undertaken by a large untrained crew.

Finish Categories

Twelve finish categories were defined for the complete Tumatumani ceramic assemblage, including all pastes and time periods. These categories were based on observation of surface finishing techniques, i.e., wiping, scraping, and burnishing, including the width of the burnish stroke, its visibility, and whether burnishing was applied to a leather-hard or moist clay surface. Table 4 shows the distribution of finishes for each paste as found in the first and second construction levels of the Unit 1 excavations.

Category 1

Category 1 includes the wiped or scraped finishes at Tumatumani. Sherds classified directly

into this category (see Table 4) have a wiped or scraped finish on both sides. Scraping, which is in fact more a shaping than a finishing technique, was performed with a hard-edged tool, such as a piece of wood or flaked stone, leaving even and parallel striations. The effect is similar to that illustrated by Shepard (1956: Fig. 13c right), although the striations are not quite as pronounced. There is little drag of the temper grains, and the surface contour of the sherds is even or slightly irregular. Wiped surfaces are more common in category 1 than surfaces that were left completely unelaborated after the initial scraping process. Wiping was undertaken on a plastic clay surface and produced fine, even and parallel clay ridges with a characteristic plastic flow, similar in appearance to that illustrated by Shepard (1956: Fig. 13c left). Surface contours are generally even or slightly irregular. Wiping was performed with a soft, yielding tool such as a piece of cloth or leather, or the hand. Striations are particularly fine and even on rims, suggesting that this part of the vessel was finished with a cloth folded over the top of the rim. The even contours of wiped sherds indicate that they were first scraped to even out pits and bumps, and then remoistened and given a final finish with a wiping tool. Both wipe and scrape are invariably horizontal on the interiors of vessels in all pastes but can be either horizontal or vertical on the exterior, depending on vessel type and where on the vessel this finish occurs.

Category 1 finishes are the only ones to be cross-referenced with other finish categories. Thus, category 1 sherds are wiped and scraped on both sides, but category 1 finishes themselves also occur on the opposite faces of burnished sherds in categories 3–11. Category 1 wipes and scrapes are found with the highest frequency on Paste 1 sherds, particularly on the interior and exterior of jar necks and on the interiors of almost all vessel forms, even bowls, which were only rarely burnished on the interior in the Late Sillumocco period. They are found with less frequency on the exteriors of bowls or on the exteriors of bases other than the utilitarian thickened edge base shape. Wiped and scraped finishes are rare on Paste 2 vessels, which are principally burnished, but they are found occasionally on the interiors of exteriorly burnished forms. Paste 3 has its own category of wipe (category 9), but category 1 wipes and scrapes are found with some frequency on the interior and exterior of jar necks and the interior of decorated and open forms. Wiping or scraping generally does not occur on the fiber-tempered wares; it is absent

in Pastes 6, 8, and 9, extremely rare in Paste 7, and occurs on Paste 5 vessels only in the reduced-fiber examples, mostly on the interior. Category 1 finishes are also found only infrequently on the later Pastes 11, 12, and 13, which when unburnished are more likely to have smoothed or wiped surfaces from categories 10–12. Again, when category 1 finishes do occur on only one side of the vessel in these pastes, they are generally on the interior.

Category 2

Sherds of this category have a rough grainy surface, with faint traces of a wipe executed while the clay was in a plastic state but without great attention to detail. Many spots are missed, and temper grains show through onto the surface. Sherds in category 2 also occur with category 1 scraped interiors. Category 2 finishes are generally found on the bottom of vessel bases and occasionally on the exterior of Late Sillumocco period Paste 1 bowls. They occur only in Pastes 1, 2, and 3, where in all cases they are a minor finish category.

Category 3

Category 3 is the first of the burnished categories. Burnishing strokes are wide, from 2.5 to 4 mm, and have distinctly visible clay ridges along their sides and at the end of the strokes. The effect is similar to that illustrated by Shepard (1956: Fig. 13e), but with even more pronounced burnishing troughs. The pushed clay ridges of category 3 burnishes suggest that burnishing in this case was performed on a somewhat moist clay, just before the leather-hard stage. The luster of category 3 burnishes is predictably low or matte, since a considerable amount of shrinkage would have occurred after the burnishing process, removing the luster from the surface. Burnishing in category 3 occurs only on the exterior of vessels; interiors have a scrape or wipe from category 1. Variations include a burnish that achieves complete coverage over the surface of the vessel, or a more commonly found incomplete coverage, with narrow strips left between the burnish lines. These unfinished areas show the scraped surface below the burnish. Another variation in which the strokes are extremely widely spaced and have a very haphazard appearance occurs only on Paste 1 specimens. Category 3 burnishes are found principally on the

exterior of Paste 1 utilitarian thickened edge bases and occasionally on large straight-sided bowls. Its presence mostly on bases is probably attributable to the fact that vessels were not dried completely before burnishing, so that the burnishing process was begun when the thinner rim area was dried to a leather-hard stage but the thicker base was still moist. The occurrence of category 3 burnishes on other pastes at Tumatamani is limited to Paste 3, where it is found only rarely. The entire category 3 group of finishes appears to have been used only during the pre-Tiwanaku period at Tumatamani; it is not found on Tiwanaku or post-Tiwanaku period vessels.

Category 4

Category 4 burnishes are similar to those of category 3. Burnishing is executed just before the leather-hard stage, resulting in the same clay ridges along the edges of the burnish strokes, but the width of these strokes is slightly narrower, from 1 to 1.5 mm wide. The luster of the finished vessel, usually medium, is also slightly higher than that of category 3 specimens. Burnishing occurs only on the exterior; interiors are scraped or wiped. Complete and incomplete burnish coverage variations occur, with the incomplete burnish in the majority. This finish category is restricted to Paste 1 sherds and is found on the same vessel shapes as category 3. Like category 3, it is believed to have been used only in pre-Tiwanaku times.

Category 5

Category 5 is the most popular finish category at Tumatamani. It occurs on the largest percentage of the Paste 1 sherds and is used in some percentage on practically all the pastes, with the exception of two of the fiber-tempered examples. Burnishes in this category are executed on a leather-hard clay surface; there is no pushing of clay along the edges, and there are no burnishing troughs. The burnish strokes themselves are just barely visible in the form of parallel burnishing facets. Lusters range from low to high, but the majority fall in the medium range. Strokes are fairly wide, from 2 to 2.5 mm, and contours are even or slightly irregular. Both complete burnish coverage and incomplete coverage types are found. The vast majority of category 5 sherds are burnished on the exterior only, with a wiped or scraped interior, but variations include a complete and/or

incomplete category 5 burnish on both faces and, in small quantities, a wiped or scraped exterior and a category 5 burnish on the interior. When burnishing occurs on the interior, in this and all burnish categories at Tumatumani, it is invariably horizontal in orientation. Exterior burnishes can be either horizontal or vertical, depending on the vessel type and where on the vessel the burnish is placed. There is a certain lack of consistency in the orientation of exterior burnishes, particularly in the Paste 1 group, which has a larger sample to draw from. As a general rule, straight-sided vessels with either vertical or flaring walls have a vertical burnish and bowls have a horizontal burnish. Burnish directions, however, are often different even on the same vessel, with, for example, a horizontal burnish at the rim and a vertical burnish below. Category 5 burnishes are found with the highest frequency on the exteriors of Paste 1 bowls, bases, and burnished jar necks and somewhat less commonly on the thickened edge bases. Category 5 burnishes also appear in small percentages on Pastes 3 and 5 plainwares. In the other paste groups, category 5 is most often represented in its complete coverage version on decorated wares. It occurs only rarely on the fiber-tempered pastes.

Category 6

Category 6 is the narrow burnish stroke counterpart to category 5. Burnishing was again performed on a leather-hard surface, and the strokes are just barely visible, but in this case they are slightly narrower, from 1 to 1.5 mm. As in category 4, the narrow burnish stroke category 6 tends to achieve a slightly higher luster than its wide-stroke equivalent. Lusters range from medium to high. While a majority of sherds have wiped or scraped interiors, minor variations in this category include sherds burnished on both sides and, in small percentages, sherds with a burnished interior and a category 1 exterior. Category 6 is the second most popular finish for Paste 1 vessels, where it occurs most frequently on the exteriors of bowls and on jar necks. It is used less frequently on bases. The use of category 6 burnishes on ceramics of other paste types is again restricted mostly to the decorated wares.

Category 7

Category 7 is one of the fine burnish categories at Tumatumani and the finest found on pre-Ti-

wanaku period ceramics. Burnish marks are not visible at all and leave no grooves or facets. Contours are even and smooth, and burnish luster is high. Burnish occurs in complete and incomplete coverage versions, but the spaces left between the burnishing strokes of the incomplete version are narrower than in the incomplete coverage varieties of categories 3–6. The majority of category 7 sherds are burnished on both sides, with a smaller percentage burnished on the exterior or interior only. Except for the fineware Paste 2 sample and some Tiwanaku and post-Tiwanaku specimens, category 7 burnishes are generally not found on plain or monochrome-slipped ceramics. However, they are the most popular for decorated or fancy wares in nearly all the pastes. They are rarely found on the fiber-tempered pastes; examples include only sherds from the reduced-fiber version of Paste 5 and one Paste 6 specimen. These sherds are from the surface collections and do not appear in Table 4. Also from the surface collections are decorated sherds finished with category 7 burnishes in Pastes 4 and 10. Category 7 finishes are not found on the late Pastes 11 and 12 but do occur on Paste 13 on both plainware and decorated specimens, including Late Horizon decorated sherds.

Category 8

This finish category is restricted to the fiber-tempered pastes at Tumatumani, and virtually all the fiber-tempered sherds are burnished with category 8 burnishes. Burnish strokes are not visible and leave no grooves. Burnish luster is medium or high, and surface contours are even or only slightly irregular. Both complete and incomplete coverage examples exist. As is characteristic of fiber-tempered pastes, these sherds have fiber voids visible on the surface, ranging from sparse to considerably dense, depending on the paste and the individual variation in attention to surface appearance. If the pieces are slipped, as they are in the majority, the slipped surface is sometimes cracked in hairline fractures. Sherds are usually burnished on both sides, although wiped and scraped interiors or exteriors do occur infrequently in all the fiber-tempered pastes. In these cases the wipe or scrape is similar to the category 1 versions. Occasionally a fiber-tempered equivalent to the category 2 finishes, a rough, grainy surface with a large number of fiber voids visible, is found on the exterior of a sherd, with a burnish on the interior. These sherds probably come from open

forms, but no rim or base sherds of this finish type were found that would aid in identifying a specific shape.

Category 9

Category 9 is a particular type of plastic wipe characteristic of Paste 3 sherds. Wiping in this category imparts a layer of fine clay particles to the surface of the sherd and gives it a distinctive muddy appearance. This layer of fine clay was probably achieved through repeated wiping with a moist cloth or hand, causing the fine clay particles in the paste to float to the surface of the sherd. The floated clay layer does not succeed in covering the abundant temper grains of Paste 3, and surfaces consequently have a grainy appearance. Wiping ridges are visible but are somewhat less even and parallel than their category 1 counterparts. The contours of these sherds are even or slightly irregular. Interiors may have either the same fine clay wipe or a wipe or scrape from category 1, in which case the temper grains still show through on the surface. A large number of Paste 3 sherds still have a category 1 finish on both sides; the fine clay particle category 9 appears to have been used only on part of the total assemblage, generally the interior and exterior of jar necks, and perhaps on the bodies as well, and on the exteriors of most of the bowl forms. Paste 3 sherds that have an incomplete burnish in categories 3–7 show, in the spaces between the strokes, the standard nonfloated plastic wipe or scrape below.

Category 10

Finish categories 10–12 occur only in the second construction episode levels. They are found only on ceramics that date to the Tiwanaku and post-Tiwanaku occupation of Tumatamani and were used on both the early pastes that continued to be manufactured during Tiwanaku times (Pastes 1, 2, 3, 5, and perhaps 4) and on the exclusively Tiwanaku and post-Tiwanaku pastes (Pastes 11–13). Category 10 is the finest of the three. It can best be described as a velvet-smooth finish. Unburnished sherds have no traces of wiping or scraping of any kind visible on the surface of the sherd. Experiments show that they were probably compacted or rubbed with a soft cloth or piece of leather at the leather-hard stage, leaving a matte-smooth surface. Contours are even or very even

and smooth to the touch. Burnishing was evidently performed with a wide tool on a leather-hard or almost dry clay surface and can have either a complete or slightly incomplete coverage. Burnish strokes are similar to, but finer than, those of category 7, leaving no grooves or facets of any kind. In the few spaces between the strokes of the incompletely burnished sherds, the velvet-smooth finish described above is visible. Contours are very even, and the luster of these sherds is medium or high. Category 10 finishes are found on Pastes 1, 2, 3, 11, 12, and 13. Burnished sherds are more frequent than sherds that are smoothed only on both faces. Burnishing is more likely to be on the exterior than on both faces of the sherd. Interior-only burnishes are less popular and in the sample of diagnostic sherds are found only on bowl shapes. Mixing with finishes from categories 1, 5, 6, and 11 is also found, with, for instance, a category 10 burnish on one side and a category 5 burnish on the other. Because the presence or absence of category 10–12 finishes was deemed to be a significant attribute in dating the Tiwanaku and post-Tiwanaku sherds, examples with 1–6/10–12 mixes were coded as belonging to the later finish categories. It is important to note, however, that categories 10–12 do not represent a complete change in finishing techniques but are in fact frequently combined with finishes from the earlier categories.

Category 11

Category 11 is a less finely finished version of category 10. It occurs more commonly on Pastes 1, 2, 3, and 5, those pastes with a previous history of manufacture at Tumatamani, whereas category 10 was favored for Pastes 11, 12, and 13. Unburnished varieties of category 11 have a finish that only approximates velvet smooth. Over most of the surface no traces of finishing can be seen; however, occasionally a faint wipe or scrape mark is found. Contours are even only, and rarely very even. The burnished variety is also less finely finished. Burnish strokes leave no grooves or facets, but the luster is low or medium, and surface contours are even rather than very even. Spaces between burnish strokes are slightly more frequent, and on the smoothed surface beneath an occasional faint finish mark can be seen. Sherds that are smoothed only on both sides form a majority in category 11. Of the burnished sherds, an exterior-only burnish is the most common, while burnish on both sides or on the interior only occurs

less frequently, and in smaller percentages than in category 10. Like category 10 finishes, category 11 finishes are used along with earlier category 1, 5, and 6 wipes, scrapes, or burnishes on opposite sides of a single sherd.

Category 12

Category 12 is principally a wiped finish category, similar to category 9. Wiped surfaces display even and parallel clay ridges, with the same layer of floated fine clay as the category 9 examples. Category 12 wipes are found only on Paste 1 sherds in the Tumatamani excavation sample, where they occur mostly on jar necks and on the interiors of exteriorly decorated Tiwanaku ceramics. Additional category 12 wipes, also on the interiors of Tiwanaku decorated wares, are found on surface-collected specimens of Pastes 5 and 13. These wipes are not found on Pastes 11 and 12 ceramics, where unburnished surfaces are finished with an even, parallel plastic scrape or wipe from category 1 or have a smoothed finish from categories 10 or 11. Category 12 burnishes are less frequent and have been found only on the exteriors of Paste 1 body sherds. Burnishes have strokes similar to those of categories 5 and 6 on leather-hard clay, with burnishing facets just barely visible. Burnishing is always incomplete, and in the spaces between the strokes the floated clay wipe can be seen. Interiors of these sherds can have the same category 12 wipe or a wipe or scrape from category 1.

Paste 1 Undecorated and Monochrome-Slipped Ceramics

The locally manufactured Paste 1 specimens form the majority of ceramics found at Tumatamani, both decorated and utilitarian. What follows is a discussion of one group of Paste 1 undecorated and monochrome-slipped ceramics drawn mostly from examples in the first construction episode fill of Unit 1 and pertinent sherds from the surface collections and second construction episode levels. In spite of their varied archaeological provenience, the undecorated wares described here are believed to be contemporary and to date to the Late Sillumocco period. The dating of this undecorated group is discussed at the end of the shape descriptions and is followed by an account of the Paste 1 Tiwanaku period undecorated assemblage. Decorat-

ed Paste 1 ceramics are addressed separately in a later section.

Surface Color and Slip

Table 5 shows the distribution of surface color categories for the total sample of body and rim sherds from the Unit 1 excavations. Categorization of unslipped sherds was based principally on exterior surface color. The category "blackware" in the table refers to those ceramics that were reduced or smudged in firing, as described in the paste descriptions, or those with dark brown surface colors. These sherds characteristically have a medium to large amount of mica visible on their surfaces. Surface colors fall in the range of 2.5YR, 5YR or 7.5YR 2-3/0-4. The category "redware" refers to sherds that were oxidized in firing, incompletely oxidized, or cooled to produce a red-brown, light red-brown, light brown, or light orange-brown surface color of 2.5YR 5/4-8 or 5YR 5-6/4-8. They tend to have a slightly less micaceous aspect than the blackwares, principally because they lack the contrast of the black ceramics, which causes the mica to stand out.

The red slips on the Paste 1 monochrome-slipped ceramics include colors that range from red or dark red to red-brown. Munsell colors are 7.5R 3/3-7, 3.5/6; 10R 3/3-6, 3.5/6, 4/4-8; and 2.5YR 3/4-6, 4/4-6. Bright reds, such as 7.5R 3 or 3.5/8, do exist but are extremely rare. Red slips are generally thin, and application can vary from uniform and even to patchy. Applied to a micaceous surface, they do not cover the mica completely, so that these vessels are almost as micaceous as the unslipped wares. Red slips are used more frequently on the oxidized wares but also occur on a fair percentage of black or gray reduced vessels, where their color range tends to be slightly darker. Burnishes applied to these latter vessels tend to result in a characteristic black streaked effect. Brown slips on Paste 1 wares are also thin but are applied more evenly than the red slips and tend to cover the surface mica more uniformly. They are used with just a slightly greater preference on the reduced wares. Colors are 5YR 5/3-6, 6/4; 7.5YR 4/3, 5/3-6, 6/4-5; and 10YR 5-6/3. Both red- and brown-slipped vessels are frequently left unburnished, the slip being applied directly onto a wiped surface without further elaboration. As Table 5 indicates, sherds of the blackware group predominate over the redware, particularly in the material from the first construction levels. Of the slipped wares, the red exterior slip predominates, although the slipped

TABLE 5. Surface color and finish of Paste 1 specimens in Unit 1 excavations, by construction episode.

Finish category	Blackware	Redware	Red-slipped exterior	Red-slipped interior	Red-slipped interior + exterior		Brown-slipped exterior	Brown-slipped interior	Brown-slipped interior + exterior	Red exterior, brown interior	Brown exterior, red interior	Total %	Total number of sherds
					Red-slipped interior	Red-slipped exterior							
1st construction													
1	54.0	29.1	11.7	0.7	1.5	1.9			1.1			100.0	265
2	70.0	30.0										100.0	10
3	67.5	27.7	4.3			0.5						100.0	209
4	74.1	22.5	3.4									100.0	89
5	63.6	25.2	10.0	0.2	0.6	0.2			0.2			100.0	528
6	66.3	21.3	12.1						0.3			100.0	282
All finishes	63.6	25.4	9.4	0.2	0.5	0.5			0.4			100.0	1,383
2nd construction													
1	38.9	41.0	7.4	0.8	8.7	0.2	0.3		1.9	0.6	0.2	100.0	620
2	25.0	75.0										100.0	12
3	59.4	37.5	1.6						1.6			100.1	64
4	43.6	52.7	1.8						1.8			99.9	55
5	42.7	39.2	16.1	0.8	0.9	0.2			0.1			100.0	973
6	56.5	31.0	11.3		0.6	0.3	0.3		0.1			100.1	710
7		27.3	18.2	18.2	36.4							100.1	11
10	16.7	30.9	23.8	4.8	16.7	4.8					2.4	100.1	42
11	46.1	27.9	13.9	2.9	7.2	0.5			1.0	0.5		100.0	208
12	56.9	12.1	17.2	1.7	6.9				3.4	1.7		99.9	58
All finishes	45.7	36.3	12.2	0.9	3.5	0.3	0.1		0.7	0.2	*	99.9	2,753

*Less than 0.1%.

wares in general form a small percentage of the Paste 1 assemblage. Looking at the data from the first construction levels in Table 5, those levels that do not contain post-Late Sillumocco material, we see that category 1 sherds are the most likely to be slipped and have the highest percentage of brown slips. This reflects the fact that category 1 finishes are commonly used on jar necks (the vessel shape most likely to be slipped) and on bowls. Categories 5 and 6 are the next in rank in their percentage of slipped examples. These finishes are used principally on bowls and bases, which as a whole are slipped slightly less often than jar necks. Sherds in categories 3 and 4 have a low percentage of slipped examples. Vessels in these finish groups are mostly utilitarian thickened edge bases and are finished with less attention to detail. Category 2 sherds are never slipped; however, these sherds come exclusively from the bottoms of bases or from other unfinished areas of the vessel.

Shapes

The Tumatamani sample was classified into four major shape categories: jars, *ollas*, bowls, and bases. We found no complete vessels and only two sherds that preserve a complete rim-to-base profile. Shape categories were therefore created on the basis of rim sherds and perceived wall contours and are necessarily somewhat broad. A bowl was defined as an unrestricted vessel with an orifice diameter equal to or greater than the maximum vessel diameter (Shepard 1956: 228, Fig. 22). Since orifice restriction, diameter, and general wall contour could be reasonably judged from a fairly large rim sherd, bowls were the most easily identifiable shape. Incurving bowls, properly a restricted shape, were also included in the bowl shape category.

A jar was defined as a necked vessel with a height greater than its maximum diameter (Rice 1987: 216). Neither height nor vessel body diameter was known, however, so that the jar category at Tumatamani is, in effect, a category of any necked vessel and could theoretically include specimens with a wide variety of height and body shapes.

A separate category of *ollas* was identified for some of the paste types in the sample, principally the fiber-tempered pastes. Based on rim sherds alone, the distinction between jars and *ollas* is sometimes ambiguous. *Ollas* were considered to be vessels with spheroid, ellipsoid, or ovaloid body shapes whose height did not exceed the maximum diameter of the vessel. Most important for the

classification of this sample, *ollas* were considered to have wide, slightly constricted orifices, and necks or collars lower than those found on the jars. The terms jar, bowl, and *olla* are used for descriptive purposes only and are not meant to imply a probable function for any of the vessels in the sample.

JARS (Figs. 18–31)—The most commonly found Paste 1 vessel shape at Tumatamani is the jar. The necks of these jars occur in two principal variations, everted (Figs. 18–24) and slightly everted (Figs. 25–30). Lip shapes are most often flat, usually with a slight groove in the middle of the lip created by the low ridges of clay pushed up from the interior and exterior of the vessel during finishing. A less common lip shape has a curved interior edge and an angled exterior edge. Jar necks from Tumatamani invariably have an even, parallel horizontal wipe on both the interior and exterior faces. There was no effort to give the interior of the neck a better finish. In the majority of cases, this horizontal wipe changes to a vertical scrape on the exterior within or below the curve of the neck constriction. We can assume that this vertical finish continues down the body of the vessel, although no complete jars have been found. Rim diameters of these jars range from 6 to 24 cm, with an average of 13 cm. Everted rims have a somewhat larger average diameter than the slightly everted rims. Oxidized and reduced or smudged rims, the latter frequently with only thin gray or black “rinds,” occur in roughly equal proportions. About 60% of the everted rims are slipped, whereas only 32% of the slightly everted rims are slipped. A red slip is slightly more popular than other colors and is found mostly on the exterior, or on both faces of the rim. Only 2% of the sample have a red interior-only slip. Brown slips are more likely to be found on both sides of the rim than on the exterior only; interior-only brown slips do not occur.

In 16% of the jar rim sample, rather than a vertical scrape below a horizontal wipe on the neck, a vertical burnish from category 5 or 6 was used to finish the body of the jar, while the neck itself was left wiped. Like the vertical scrape, burnishing starts somewhere within or just below the neck constriction. Burnished pieces occur equally in both the everted and slightly everted rim types. They are more likely to fall into the blackware category than the unburnished rims. Fifty percent of the sample is slipped, and slipping is weighted more toward the red slips than in the unburnished group. In an ideal sample of whole vessels, there would undoubtedly be a higher percentage of burnished

jars, since in the preserved assemblage many of the rim sherds are broken above the neck constriction. If we use as a sample only those rims with a fair portion of the neck and body preserved, the percentage of burnished examples rises to 32% of the jar sample.

At times, jars were decorated with an incised fillet running around the joint between neck and body (Fig. 31). All three examples found are from unslipped redware vessels. Fillets are approximately 1 cm wide with a relief elevation of 3–4 mm and are incised with diagonal or everted V-shaped slashes. Vertical rim-to-body strap handles were applied to jars only in a limited number of cases. Two examples were found, both from medium to large-sized jars (Figs. 60, 61). One example has an exterior light brown slip, the other is an unslipped dark brown. Other jars may also have had strap handles located on the body itself.

BOWLS (Figs. 32–43)—Various open form shapes occur in the Tumatumani plain and monochrome-slipped wares. Significantly, none of them present a more carefully finished interior face than exterior. Slipping, which occurs on slightly less than half the sample, is most often on the exterior, or on both faces. Slipping on the interior only is rare and occurs only on the possible small shallow bowl form. Burnished interiors are also quite scarce and are found only in conjunction with a burnished exterior. Interior burnishing is always horizontal and exterior burnishing generally so, although some vertically burnished examples do exist. Burnished interiors occur on shape D bowls and on the small shallow bowls. Only one example was found outside of these two shape categories, on a shape E bowl, but the interior burnish in this case is only cursory. Data from the body sherd analysis reveal the same pattern: only two Paste 1 body sherds from the first construction levels (or 0.1% of the sample) have an interior burnish and exterior wipe, and only 16 sherds (1% of the sample) are burnished on both sides. As will be seen, one significant change in finishing techniques during the Tiwanaku period at Tumatumani was an increase in the use of burnish on the interiors of vessels. Firing preferences for these bowls tend toward oxidation of the small shallow bowls and bowl shapes B and C, and reduction or smudging, generally with a gray or black “rind,” for the larger bowls A, D, and E and the straight-sided forms.

Bowl Shape A (Figs. 32–35)—The shape A form has an unusual rim, thickened at the lip on both the interior and exterior, giving it a triangular shape in profile. The total sample for this shape is six

rim sherds from the surface collections and the first and second construction levels. Diameters range from 13 to 25 cm, with an average of 20 cm. Two examples are an unslipped dark gray and one is an unslipped red-brown. Slipped sherds include two vessels slipped light brown and one slipped red-brown on both sides. Despite the interior slips, all sherds have a simple, even contour horizontal category 1 scrape on the interior surface. The exterior finish is either a horizontal scrape, a horizontal burnish up to the rim, or a horizontal wipe changing to a vertical burnish approximately 1.5 cm below the rim, similar to the finish used for the jar necks. Burnishes, from categories 5 and 6, are incomplete and of low luster. Bowl shape A is the most likely to have embellishments on the rim; specimens have been found with thin flat lugs applied to the rim, incised appliqué, or incision on the rim itself (Figs. 33–35). Figure 32 also once had a handle, lug, or appliqué of some kind attached to the rim but now broken off.

Bowl Shape B (Figs. 36, 37)—Shape B is an open form of 16–20 cm in diameter with a band of thickening at the rim of approximately 2 cm in height. Only two examples are known: both have oxidized red-brown surfaces, and one is slipped light brown on both sides. Both have an incomplete medium or high luster burnish from categories 5 or 6 on the exterior, one horizontal, one vertical below a horizontal wipe at the rim; interiors have even contour scrapes.

Bowl Shape C (Fig. 38)—Shape C also is represented by only two examples. It is an open bowl with an interior-beveled rim. Diameters are 16 and 19 cm; one example is slipped red on the exterior and on the interior beveled shelf, the other is red-brown unslipped. These bowls are finished with an incomplete horizontal burnish from categories 3 or 6 on the exterior and the beveled portion of the interior. The exterior surface contours are slightly irregular, and burnish lusters are both high and low. Interiors are scraped only.

Bowl Shape D (Figs. 39–41)—Shape D has a direct rim and rounded lip; diameters range from 10 to 20 cm. In contrast to shapes A, B, and C, shape D bowls have an incomplete horizontal category 5 low luster burnish on both the interior and exterior in two of the five examples. The burnished rims are slipped, one red on both faces and one light brown on the exterior. The other three rims are scraped on both sides, two with a particularly grainy exterior. One of these scraped rims is slipped red on both faces, the others are unslipped blackware. One rim is decorated with a small incised

nubbin (Fig. 40), another has a horizontal strap handle (Fig. 41).

Bowl Shape E (Figs. 42, 43)—The four bowls in the shape E sample have flat, direct rims. These vessels appear to come in two sizes: a small version in the 12–13 cm range and a larger 23–25 cm size. Three rims are unslipped with reduced or smudged gray surfaces; one of these is gray on the interior only, with a red-brown exterior. The fourth rim has a light brown slip on both faces. Interiors are wiped or scraped with an even surface contour, although one of the blackware examples has a cursory horizontal category 6 burnish on the interior. Exteriors vary and include a horizontal wipe, a horizontal wipe at the rim and a vertical scrape below this (recalling the jar neck finishes), and a horizontal burnish from categories 5 or 6, found on two of the blackware rims. Burnish coverage is not complete, and lusters range from low to high. Exterior surface contours are even or slightly irregular.

STRAIGHT-SIDED BOWLS (Figs. 44, 45)—These shapes differ from the bowls discussed above in that their walls are not convex but rather straight in contour on both the interior and exterior faces and slightly flaring. The term straight-sided should not be confused with vertical-sided, which refers to a vessel with a wall at a 90° angle to the base. Straight-sided vessels at Tumatamani are difficult to identify, since a fairly large rim sherd is needed to adequately judge the vessel shape. The number of straight-sided vessels in the total assemblage is therefore probably larger than the two examples that can be confidently identified (Figs. 44, 45). (Bowl shape A appears to be, in addition, a category of basically straight-sided vessels, at least on the exterior face.) Both of the rims illustrated are unslipped, one red-brown and one gray in color, with an incomplete vertical low luster burnish from categories 3 or 6 reaching up to or within 3 cm of the rim. One also has a cursory category 5 burnish on the interior. The vessels are large and deep, with diameters of 22 and 28 cm. As the illustrations show, straight-sided bowls were made with both loop handles on the rim, or horizontal strap handles located just below the rim. The illustrated examples have flat or slightly rounded rims, while other possible examples of this shape are found with rims which are rounded and just slightly thickened.

MISCELLANEOUS RIMS (Figs. 46–51)—A number of miscellaneous rims were found at Tumatamani, none with a large or consistent enough sample to be classified into any shape group. Two of these

are decorated rims. The sherd shown in Figure 46 probably comes from a shape E bowl. The incised “shelf” visible in the illustration was applied to a much smaller rim, which appears to have been flat. The slight bulge on the exterior, below the shelf, is also a by-product of the appliqué. The piece has an unslipped grayish brown exterior with a matte vertical burnish from category 5; the interior is scraped and then slipped light reddish brown. The “shelf” is slipped as well. The sherd illustrated in Figure 47 also appears to come from a shape E bowl. The piece is too small to judge accurately whether the lower wall was straight or convex, but the interior and exterior finish, an even contour wipe, is more characteristic of bowl shape E than the straight-sided forms. The rim is unslipped and red-brown in color.

The rim sherd illustrated in Figure 48 has a unique flattened lip shape. It would appear to belong to a straight-sided bowl. The exterior is finished with an incomplete category 6 horizontal burnish and has a patchy red-brown slip; the interior is a scraped unslipped gray surface. Figure 49 illustrates a distinctive rim of which only one example exists in the Tumatamani sample. The piece has an oxidized light red-brown surface with a light red slip applied only within the exterior groove of the rim itself. Vessel shape is in this case indeterminable, but judging from the medium luster incomplete category 5 burnish on the interior as well as the exterior, the rim appears to belong to some type of open bowl form. Other single-example rims are illustrated in Figures 50 and 51. Figure 50 is a small incurving bowl with an unusual light red slip, an incomplete high luster horizontal burnish on the exterior, and an unslipped wiped interior. The example in Figure 51 has a particularly thin wall compared to other Paste 1 sherds and appears to come from a cup or small open bowl. It is of an unslipped red-brown color with a simple wipe on both faces.

The possible existence of a shallow bowl form in the Tumatamani assemblage should be noted; however, the sample available is not adequate to distinguish this category with any confidence. All probable sherds are small, and some could be from everted necks. Two rims, each very different, can be more confidently identified. One has a flat horizontal direct rim, is scraped on both faces with a red slip on the exterior, and has a diameter of 8 cm and a height of approximately 2.5 cm; the other has a rounded direct rim, is finished with a horizontal incomplete category 5 burnish on both faces over an unslipped red-brown surface, and has a

diameter of 20 cm and a height of approximately 5 cm. No plates were identified in the Paste 1 sample, a fact that is unusual insofar as plates do exist in both the roughly contemporary Pucara and Qeya (Tiwanaku III) ceramic assemblages (pers. observ. by the author at the Pucara site museum; Girault, 1990: 107–109).

BASES—Thickened Edge Bases (Figs. 52–56)—Bases of this type are characterized by a thickened edge of clay around the very bottom of the base, producing the effect of a short, solid pedestal. This thickening can range from 5 to 9 mm high and usually projects outward slightly to form a pointed edge. Vessel walls themselves are straight and flaring. Thickened edge bases are the most common base type at Tumatamani, with 38 securely categorized examples. Diameters are small and range from 5 to 12 cm, with an average of 8 cm. One particularly large example has a diameter of 17 cm. Virtually all examples have the same exterior finish. The thickened area and immediately above it is unfinished or has a horizontal wipe; the walls themselves are finished with a vertical burnish. Occasionally there are also one or two horizontal burnish strokes at the bottom of the base, above the thickening. Rarely are these vessels completely unburnished on the exterior. However, despite the emphasis on burnishing, the exteriors of the thickened edge bases are somewhat coarse in appearance. Surface contours are usually irregular or slightly irregular, and burnishing never achieves complete coverage. Burnishing frequently is of categories 3 and 4, leaving burnishing troughs and pushed clay ridges, and of categories 5 and 6. Lusters range from matte to medium, with the majority in the low range. Interiors are wiped or scraped, but with even contours. The majority of these pieces (58%) are unslipped blackware. Surface colors are a deep black or very dark brown, not the superficially reduced light grays of most other shapes. Pastes are black or brown with black edges. Only 19% of the sample consists of unslipped oxidized redwares, and few bases of either red- or blackware are slipped; 13% have an exterior slip, 5% an interior slip, and 5% are slipped on both sides. Red and brown slips are found in equal numbers.

Thickened edge bases are the only shape category at Tumatamani to display carbonized deposits with any amount of frequency. These occur as distinct sooty accumulations on the surface of the sherds and are found in 23% of the thickened edge base sample. They are found most often on both sides of the vessel or on the interior in con-

junction with a black burnt or fire-blackened exterior. These deposits appear to be the result of direct exposure to fire and/or the charring of food residues on the interior of the vessel and indicate that some of these thickened edge bases come from cooking vessels. Although the overall form of these vessels is unknown, several examples of horizontal and vertical strap handles with comparable soot-ing were found (Fig. 62), suggesting that at least some specimens had strap handles located on the body of the vessel. Other thickened edge bases in the sample, however, are carbonized only on the interior, with a slipped or oxidized red exterior. A small number of body sherds in the sample also show this same arrangement. These vessels were evidently used in a different type of fire-related activity than those with sooty or fire-blackened exteriors. Because of the coarse finish of many of these specimens and the large amount of carbonization on their interiors, a utilitarian function as a portable brazier is suggested. Some examples, however, may have been used as ceremonial burners or *incensarios*. Interior blackening or burning is a trait often found on *incensarios* elsewhere in the Lake Titicaca Basin (Chávez 1985: 144, 147). Various lines of evidence indicate the presence of a ring-based decorated *incensario* form at Tumatamani (see pp. 58–59). However, a less finely finished thickened edge base version may also have existed. The exterior finish on these thickened edge bases is commensurate with that found on the shape E and straight-sided bowl forms (Figs. 42–45), so that these braziers or ceremonial burners may have had an overall V-shaped or slightly convex profile.

Pedestal Bases (Fig. 57)—A small sample of hollow pedestal bases was found at Tumatamani. Unfortunately, none are complete, so that the actual height of the pedestals themselves is unknown, but they are taller than the ring bases discussed below. Of a sample of three, diameters at the point of constriction between wall and base range from 10 to 11 cm. Pedestal bases are fairly well finished compared to the majority of Paste 1 shapes; all three examples are slipped light brown or red, either on both sides or on the interior or exterior only. One is also slipped on the interior of the pedestal itself. The interiors of the vessels have a careful, even contour horizontal scrape or medium luster category 5 burnish. On the exterior, the pedestal portion of the wall was wiped, while the vessel portion has a low or medium luster category 5 vertical burnish. One example (Fig. 57) has, in addition, a very small amount of localized carbon deposition on the interior of the vessel, indicating

its use in a presumably ceremonial fire-related activity.

Ring Bases (Figs. 58, 59)—Five ring bases were found at Tumatumani. They are similar in size to the pedestal bases, ranging from 10 to 12 cm in diameter at the constriction between wall and base. The height of the rings themselves varies from a barely elevated 3 mm to a pronounced 1.3-cm ring. Rings flare out at an angle from the horizontal plane of the bottom of the vessel; vessel walls appear to be straight or slightly convex. No preference exists for slipping the vessels: while two examples are slipped red-brown on both faces, three are unslipped red-brown or gray-brown in color. Interiors are finished with a simple wipe or scrape, and three of the five are burnished horizontally or vertically on the exterior with a matte or low luster category 5 burnish. Burnishing is rarely complete in coverage, in only one case extending as far down as the ring itself.

Miscellaneous Bases—A fair number of miscellaneous bases were found in the Tumatumani excavations; unfortunately, most were too fragmentary to reconstruct the vessel shape to which they belong. However, a number of generalizations can be made about these specimens. All bases are flat; there are no round or convex specimens in the assemblage, nor are there any bases with vertical walls that join at a 90° angle. Wall contours indicate that these miscellaneous bases come from globular vessels or open forms, i.e., from the jar and bowl categories. Some show a very small amount of thickening at the joint between vessel wall and base, although not to a degree that approximates the thickened edge base category. Surface finishes demonstrate a predominance of vertical burnishes or horizontal wipes on the exterior of all examples. Interiors are generally wiped, although the open forms may occasionally be burnished. Like the other Paste 1 base categories, any burnishing on the exterior almost invariably stops 5–10 mm from the bottom of the vessel.

Dating the Paste 1 Undecorated Ceramics

The Paste 1 ceramic assemblage just described is an associated group that shares similar characteristics of firing, finish, and vessel shape. Specimens in this group are consequently believed to be roughly contemporaneous and to date to the same period of the local Juli Sillumocco sequence.

Although a definition of the basic assemblage can be made with some confidence, the dating of these ceramics poses more of a difficulty. The Paste 1 undecorated wares in question were found in the first construction episode fill levels. The construction of the lower platform at Tumatumani has been dated, based on decorated ceramic specimens, to the Late Sillumocco period. The group of local plainwares found in the fill of this platform, i.e., the Paste 1 assemblage defined here, can therefore be assumed to be either Late Sillumocco or pre-Late Sillumocco in date. Based on a comparison of the Paste 1 assemblage, including attributes of technology, decoration, and vessel shape, with ceramic sequences of known age elsewhere in the Lake Titicaca Basin, a Late Sillumocco date is suggested. The resemblance of the other major ceramic assemblage at Tumatumani, the fiber-tempered plain and decorated wares, to those from the site of Chiripa suggests that that assemblage dates to the Early Sillumocco period, the period in the Juli sequence that was contemporary with the Chiripa culture in Bolivia.

As defined, the division between the Early Sillumocco fiber-tempered ceramics and the Late Sillumocco non-fiber-tempered Paste 1 assemblage is somewhat artificially abrupt. Obviously a period of transition existed at the site, with new Late Sillumocco traits appearing alongside a declining fiber-tempered tradition. However, owing to the nature of the archaeological evidence, this period of transition cannot be defined. There is, of course, no reason to assume that the production of fiber-tempered ceramics at Tumatumani ended with the decline of Chiripa influence at the site, or that a fiber-tempered and non-fiber-tempered tradition could not have coexisted. Bermann's (1990) excavations at Lukurmata show that the majority of plainwares at that site were fiber-tempered through the end of the Qeya (Tiwanaku III) period, and a significant number had this trait even in early Tiwanaku IV times. Examples of coexistence and continuity in the different temper traditions occur at Tumatumani as well, particularly in the decorated wares and in the plainwares of Paste 5. However, the similarities of the Tumatumani ceramics to dated assemblages elsewhere in the Titicaca Basin result in a basically successive tradition in the plainwares at the site. This is further supported by the fact that the Paste 1 assemblage described here shows considerably different characteristics of surface finish, firing techniques, shape, and decoration from the Early Sillumocco fiber-tempered wares, strongly suggesting that they are not con-

temporary but belong to successive periods in the ceramic chronology at the site.

A Late Sillumocco date for these Paste 1 ceramics makes them roughly contemporary with Classic Pucara in the northern Basin and the early phases of the Tiwanaku culture (Qalzasaya and Qeya) in the south. If the Paste 1 ceramics date to the Late Sillumocco period, then similarities should be evident between the Tumatumani material and the ceramics of these cultures. Comparisons show that a number of specific similarities do exist between the Tumatumani Paste 1 ceramics and particularly Qeya and Pucara ceramics, similarities that are not found in other earlier or later Titicaca Basin ceramic traditions.

The first set of these comparisons is related to ceramic technology. The predominantly black and brown micaceous wares from Tumatumani, for instance, are technologically similar to both Qeya and Pucara plainwares. Although Qeya painted ceramic vessels are generally fired to a light brown color, the majority of the plainwares are also an unslipped black or brown (Bennett 1934: 450). Pucara ceramics are likewise characterized by a combination of redwares and black, brown, and light brown ceramics (Franquemont 1990) and exhibit a large amount of mica on their surfaces (Kidder 1943: 5), a trait also found at Tumatumani. The closest resemblance of the Paste 1 plainwares, however, is to Qeya ceramics from Qeya Qollu Chico, which I had the opportunity to examine at the American Museum of Natural History in New York. These are manufactured from a paste very similar to Paste 1 and are fired to the same red-brown and gray tones as the Tumatumani ceramics. The Qeya Qollu Chico ceramics also exhibit one of the same characteristic firing techniques particular to the Paste 1 plainwares: superficially reduced or smudged interior and exterior "rinds" on an otherwise red-brown paste. In attributes of finish, the ceramics from Qeya Qollu Chico exhibit remarkably similar horizontal wiping and scraping techniques, which left the same parallel striations, and the same category 5 and 6 burnishes as are found on the majority of the Paste 1 Tumatumani ceramics.

The vessel shapes represented in the Paste 1 plainware assemblage also exhibit similarities to contemporary Qeya and Pucara shapes. One particular form characteristic of the Qeya Qollu Chico assemblage is a straight-sided or slightly convex-sided flaring bowl with two semicircular tabs at the rim, incised with four or five parallel lines (Wallace 1957: 46, Fig. 1: 10). Similar examples

of these tabs exist at Tumatumani (Fig. 46), plus variations on the idea of rim embellishments, such as vertical tabs and nubbins (Figs. 33, 34). These tabs are not found in other southern Titicaca Basin cultures and occur at Tumatumani only on the Paste 1 bowl shapes presumed to be Late Sillumocco in date. Horizontal lugs at the rim, similar in concept to the Qeya Qollu Chico tabs, are found on Pucara bowls (Rowe and Brandel 1971: Fig. 67), but they are never incised and are used only on finely slipped and burnished vessels.

Another characteristic of the Paste 1 plainwares is the horizontal strap handle found on the rims of bowl shape D, the straight-sided bowl shape, and one of the miscellaneous shape examples (Figs. 41, 45, 48). These horizontal strap handles can be compared to similar examples occurring on the rims of Qalzasaya and Qeya vessels (Ponce Sanginés, 1971: Figs. 1-13,4,12, Figs. 2-2,5,21,23; Bermann 1990: Fig. 63 top; Albarracin-Jordan and Mathews 1990: Fig. 6b top; Bennett 1934: Figs. 13f,g), as well as the roughly contemporary plainware assemblage from Lukurmata (Bermann 1990: Fig. 50b). Incurving bowls, such as in Figure 50, have not been identified in the Qalzasaya and Qeya assemblages but do occur at Pucara (Franquemont 1990: Figs. 71-75). Comparisons of the Tumatumani rim shapes are less conclusive. Many of the characteristic Paste 1 rim shapes, such as that of bowl shape A, are not found on either Pucara or Qeya ceramics, nor are the characteristic Pucara thickened rims (Franquemont 1990: Figs. 19-22, 37-40, 43-44) or interior beveled rims found at Tumatumani, except perhaps on bowl shape C. Paste 1 jar rims, however, do bear a general resemblance to Pucara jars (Franquemont 1990: Figs. 50-57). The flat or slightly rounded rims on Tumatumani bowl shapes B and E and on the straight-sided bowls are also comparable to bowl rims found at Qeya Qollu Chico and to some of the Pucara bowl rim shapes (Franquemont 1990: Fig. 25).

The thickening that occurs at the joint between vessel wall and base in the Paste 1 thickened edge base group, and to a lesser extent on the convex-walled bases, was one characteristic that set the Paste 1 assemblage apart from others at Tumatumani. This distinctive feature also occurs on Pucara jars (Franquemont 1990: 6-7, Fig. 49) and the bottles and tab bowls from Qeya Qollu Chico (Wallace 1957: 43, 46). Pedestal bases, found at Tumatumani (Fig. 57), also occur at Pucara and in the Qeya Qollu Chico collections. The Pucara examples are 5-6 cm high (Franquemont 1990: 4)

and the Qeya Qollu Chico example is 6 cm high; the height of the Tumatumani examples is unfortunately unknown.

Perhaps the single most important diagnostic shape that places the Tumatumani Paste 1 group in the Late Sillumocco period is the *incensario*. Paste 1 incised and feline head *incensarios* are discussed in the section on decorated ceramics, and their similarities to Qeya *incensarios* are noted and described. Various plainware sherds have been found, however, that indicate the existence of an *incensario* form at Tumatumani. Qeya *incensarios* have flat bases or bases with an elevated ring no more than 3 cm in height, straight-sided flaring walls, and flat or slightly rounded rims elaborated with scallops or pierced loops (Wallace 1957; Bennett 1934). Ring-based bowl forms are also found in the Qalasangaya assemblage (Ponce Sangines 1971: Figs. 2-2,5,21,23) and at Lukurmata (Bermann 1990: Fig. 50b). The height of the Tumatumani ring bases falls within the range of all these examples. However, the presence of rim scallops in the Tumatumani assemblage (Fig. 64), as well as the decoration on the incised examples, indicates the existence at Tumatumani of vessels more closely akin to Qeya *incensarios*, since rim scallops are not found in the Qalasangaya assemblage. Although Tiwanaku ceramics also have scalloped rims, they are slipped and decorated, and generally larger in proportion. Finally, pierced loops at the rim, found on Qeya *incensarios* and the ring-based bowls at Lukurmata (Wallace 1957: 36-37, Pl. 1e; Bermann 1990: Fig. 52b), also occur at Tumatumani (Fig. 63). The one example that preserves a fairly large section of the rim (Fig. 44) suggests, from the amount of space to the right of the loop, that it functioned as a handle. However, the possibility of multiple loops along the top of the rim of smaller vessels, approximating the Qeya arrangement, cannot be discarded.

Tiwanaku Period Paste 1 Undecorated and Monochrome-Slipped Ceramics

The Paste 1 ceramics described in this section are believed to date to the Tiwanaku period, contemporary with the construction of the upper platform at Tumatumani. They are identified principally by the presence of category 10-12 finishes on their surfaces, finishes that appear for the first

time in the second construction fill. The definition of a Tiwanaku period plainware assemblage from Tumatumani at this time is tentative. The fact that finish categories 10-12 do not occur in the first construction fill gives them a post-Late Sillumocco date. Their presence in large quantities in the second construction fill, and the identifiable continuity in vessel shapes between this sample and the Late Sillumocco Paste 1 wares, indicates that the Paste 1 category 10-12 specimens are not post-Tiwanaku intrusions. However, it is unlikely that the transition between the Late Sillumocco and Tiwanaku periods involved a total change in domestic ceramic production. At least some of the Late Sillumocco shapes described previously were probably made during Tiwanaku times in much the same form and with the same finishes as they were previously. With the archaeological evidence available, however, it has not been possible to distinguish in the second construction episode fill between Late Sillumocco specimens and similar or identical ceramics manufactured in the Tiwanaku period.

That ceramics with finish categories 10-12 finishes do not form the entire Tiwanaku period plainware assemblage is suggested by the data presented in Table 4. The percentage of the late finish category sherds in the second construction episode levels appears to be too low to represent the entire Tiwanaku period sample. If finish categories 1-6, the finishes found on the Late Sillumocco Paste 1 assemblage described earlier, were exclusively Late Sillumocco in date, then their percentages in the second construction episode levels would seem to be too high for a mixed fill that should have only representative samples of the earlier Sillumocco periods. This suggests that at least some of the sherds in finish categories 1-6 found in the second construction fill were manufactured in Tiwanaku times. This is supported by Girault's (1990) analysis of excavated ceramics at Tiwanaku itself. The majority of his utilitarian wares are still finished with wipes, scrapes, or a burnish type that leaves visible burnish strokes. His finish categories "*retocado con los dedos*," "*retocado con paño*," and a burnish that leaves no visible strokes, the probable equivalent of categories 10-12 here, occur as a minority on the utilitarian wares, although they are the most popular finishes for the decorated ceramics.

Although Tiwanaku period ceramics that exhibit continuity with the Late Sillumocco period could not be identified on an individual basis, by comparing the sample of finish categories 1-6

sherds found in the first construction levels with those from the second construction levels (Tables 4 and 5) it is possible to make some deductions about this portion of the Paste 1 Tiwanaku assemblage. The percentage of blackwares, for instance, the smudged or reduced sample, drops considerably in the second construction levels, with a corresponding increase in oxidized or incompletely oxidized ceramics. Second construction period blackwares also tend to be more superficially reduced and of a lighter color and are very rarely smudged. The Tumatumani sample, however, still differs from the ceramics excavated at Tiwanaku. Redwares remain a minority, even in the categories 10–12 group, while at Tiwanaku a majority (77%) of the assemblage had a brick red fired paste color (Girault 1990: 123). Finish categories 3 and 4 show a marked reduction in percentage in the second construction episode fill, from 15% and 7% respectively to 2%. This suggests that they were no longer produced in Tiwanaku times at Tumatumani. The persistently high percentages of finish categories 1, 5, and 6, however, imply that these finishes were still used in the second construction period. Category 1, 5, and 6 finishes were, it will be remembered, often combined with category 10–12 finishes on opposite sides of the same sherd. Finish categories 3 and 4, in contrast, never appear in conjunction with category 10–12 finishes, supporting the suggestion that they were no longer used in Tiwanaku times. The exclusive presence of category 7 in the second construction fill is probably an accident of sampling, since pre-Tiwanaku decorated Paste 1 sherds with category 7 finishes were found in the surface collections, but an increase in the use of this fine burnish finish, including its use for the first time on undecorated and monochrome-slipped wares, obviously occurred in Tiwanaku times.

An increase in interior-only burnishes is another characteristic of Tiwanaku period ceramics, reflecting the higher number of bowls, interiorly burnished everted jar necks, and burnished vessels in general in this time period. Even finish categories 5 and 6 show a modest increase in the percentage of interior-only burnishes in the second construction sample, rising from 0.4% and 0% respectively in the first construction levels to 1% and 0.6% in the second construction levels. The finish categories that appear only in the second construction levels have a markedly higher percentage of interior-only burnishes: 10% of the category 7 sample, 11% of the category 10 burnished sample, and 10% of the category 11 burnished sample. Sherds

in these categories are also more likely to be burnished on both sides: 58% of category 7, 22% of category 10, and 12% of category 11, in contrast to the relatively constant 2% figures for categories 5 and 6.

Slipping techniques also show an increase in interior slip placement in the second construction levels. Slipping in general increases, with a higher percentage of slipped sherds in the category 7–12 finish group than in finish categories 1–6, while interior-only slips increase and brown interior-only slips appear for the first time. Red and brown slips on opposite sides of the same sherd are used for the first time in the second construction period. Of the category 10–12 finish groups, category 10, the finest burnished of the three, accounts for the highest percentage of slipped sherds. Of the earlier finishes, category 1 shows the most marked increase in the use of slips. Red slips continue to be more prevalent in the second construction levels, as they were in the first. However, while the percentage of brown slips used on the earlier finish categories remains the same in the first and second construction levels, finish categories 10–12 appear on a higher percentage of brown-slipped sherds than do finish categories 1–7 in the second construction period. Although the exclusively Tiwanaku period finishes show a greater use of brown slips, the ratio of brown slips to red slips on the Tumatumani utilitarian wares is still considerably less than that found by Girault (1990) at Tiwanaku itself. Second construction period slips on utilitarian wares at Tumatumani are again thin, and the range of colors remains generally the same as in the Late Sillumocco period. In the red group, there is a greater use of the color 7.5R 3.5/6 in the second construction period, while darker browns (5YR 3/2.5) and more orange-browns (5YR 5/7, 7.5YR 5/7, 6/6) are added to the palette of brown slips.

Carbon deposits on the surfaces of identifiable second construction period ceramics are rare. Interiorly carbonized thickened edge bases are found in the second construction fill and therefore may have been used during Tiwanaku times. Other securely identifiable second construction period sherds, all body sherds, have sooty deposits on both the interior and exterior faces.

Shapes

Shape categories for the identifiable Paste 1 Tiwanaku period wares at Tumatumani, those with

category 10–12 finishes, include jars, small *ollas*, and two bowl forms. The number of diagnostic sherds is much smaller than for the first construction period sample. Rims are in the majority rounded, with a few slightly flattened examples occurring on the jar forms. No thickened rims exist in the sample. The shapes themselves generally have smaller diameters than the vessels in the Late Sillumocco assemblage. Although the nature of category 10 and 11 burnishes means that the direction of burnish often cannot be determined, in the plainware examples, mostly from category 11, where the strokes can be seen, burnish as well as wiping and scraping is always horizontal on both the interior and exterior. This contrasts with the varied vertical and horizontal arrangements found in the Late Sillumocco Paste 1 ceramics. Also distinguishing the Tiwanaku period wares is the much smaller amount of mica visible on their surfaces. Almost all the Tiwanaku period diagnostic sherds are oxidized, usually to a slightly more intense red-brown than that found in the earlier ceramics. A few incompletely oxidized examples are also found, while superficial reduction is rare and occurs only on jar necks.

JARS AND OLLAS (Figs. 65–68)—Tiwanaku period jars (Figs. 65, 66) have flaring, everted rims. Of a sample of eight specimens, all are slipped: two red on both sides, three red on the interior only, two brown on both sides, and one brown on the interior only. Three examples have a category 1 wipe on both sides, three a category 11 burnish on both sides, and two a category 11 burnish on the interior only. Diameters range from 10 to 15 cm and average 14 cm. Two examples of a short-necked vessel with a less constricted orifice were also found at Tumatamani. One (Fig. 67) appears to be from a utilitarian shape. It is an unslipped red-brown and has a category 11 burnish on both sides. The other (Fig. 68) is a much finer vessel with narrower walls. It is slipped red and is likewise finished on both sides with a category 11 burnish.

BOWLS (Fig. 69)—Tiwanaku period bowls at Tumatamani come in two forms. The first has a rounded rim and slightly convex sides, with diameters in the two examples known ranging from 12 to 17 cm. One is slipped red and exhibits a category 10 burnish on the interior, with a wiped unslipped red-brown exterior; the other is slipped red and has a category 5 burnish on the exterior, with an unslipped smoothed interior. A second bowl form has straight, slightly flaring walls with either a rounded or slightly thinned rim. These

vessels are generally slipped red and finished with a category 7 or 11 burnish on both sides. Diameters range from 13 to 20 cm. One particularly interesting example, illustrated in Figure 69, shows a certain similarity to first construction Late Sillumocco Paste 1 bowls in its size, relatively thick walls, and the loop handle at the rim. However, this loop is considerably smaller than those on Late Sillumocco examples, and the hole within the loop does not pass through from one side to the other. The vessel is slipped red, with a category 12 wipe on the exterior and a category 10 burnish on the interior.

BASES—Bases in the Tiwanaku period assemblage are flat and appear to belong to bowl and convex-sided shapes. In addition, one example was found that is reminiscent of the earlier thickened edge bases. The vessel wall, although not thickened per se, jogs up almost vertically from the bottom of the base for approximately 5 mm before flaring out in an open vessel form. In contrast to the Late Sillumocco bases, the exterior finish on Tiwanaku period examples, whether a wipe or burnish, continues evenly down to the joint between vessel wall and base.

Paste 3 Undecorated and Monochrome-Slipped Ceramics

The Paste 3 specimens form the second largest group of sherds found at Tumatamani. Their characteristic grainy surfaces and distinctive thicker rim shapes make sherds of this paste easily distinguishable from those of Paste 1. The Paste 3 vessels described in this section are drawn from examples from both the first and second construction episode fills and selected specimens from the surface collections. Like the Paste 1 assemblage discussed previously, the specimens described here are believed to be representative of a roughly contemporary ceramic assemblage dating to the Late Sillumocco period. Further discussion of the dating of these ceramics is addressed in the section following the shape descriptions.

Surface Color and Slip

Table 6 shows the distribution of surface color categories for the total sample of Paste 3 rim and body sherds in the Unit 1 excavations. The term “blackware” in this table is somewhat misleading,

TABLE 6. Surface color and finish of Paste 3 specimens in Unit 1 excavations, by construction episode.

Finish category	Black-ware	Redware	Red-slipped exterior	Red-slipped interior	Red-slipped interior + exterior	Brown-slipped exterior	Brown-slipped interior + exterior	Total %	Total number of sherds
1st construction									
1	70.3	27.0			2.7			100.0	37
2	33.3	66.7						100.0	3
3		100.0						100.0	2
5	42.9	42.9	14.3					100.1	7
6	33.3	33.3	33.3					99.9	3
7			100.0					100.0	1
9	34.8	56.6	4.3			4.3		100.0	23
All finishes	51.3	40.8	5.3		1.3	1.3		100.0	76
2nd construction									
1	27.7	57.9	11.3			0.6	2.5	100.0	159
2	100.0							100.0	2
3		100.0						100.0	1
5	14.9	43.2	32.4	2.7		1.4	5.4	100.0	74
6		66.7			33.3			100.0	3
7	33.3	33.3	33.3					99.9	3
9	40.6	37.5	2.1		15.6	1.0	3.1	99.9	96
10	33.3		33.3			33.3		99.9	3
11	28.8	53.3	2.2		11.1	2.2	2.2	99.9	45
All finishes	28.8	48.7	12.2	0.5	5.4	1.3	3.1	100.0	386

since Paste 3 reduced ceramics never have a pure black surface color. "Blackwares" of Paste 3 are gray, dark gray, brown, or a grayish dull brown in color. Redwares are an oxidized red-brown or light red-brown, or an incompletely oxidized light brown or orange-brown color, falling in the range of 2.5YR 4-5/6-7 or 5YR 5-6/4-6. Paste 3 sherds have no mica visible on their surfaces and in general are characterized by a dull, grayish appearance. Both the red and brown slips on the Paste 3 monochrome-slipped ceramics are thin and do not cover the nonplastic inclusions in the paste or marks left by surface finishing. Red slips fall in the range of 7.5R 3/4-8, 10R 3/6, 4/6-8, or 2.5YR 3/4-5, 5/6, while brown slips can be 5YR 5-6/4, 7.5YR 5/3-5, 6/4, or 10YR 5/3-4. Red and brown slips are applied with equal preference on both the reduced and oxidized sherds.

Paste 3 blackwares form the majority of the first construction sample, while redwares are more common in the sample from the second construction levels. The majority of sherds are unslipped, but slipping, when it does occur, is found principally on the burnished sherds, particularly those in the fine finish category 7. Red slips predominate over brown, which are found in the first construction episode sample only on wiped finish category 9 sherds. The presence of interior and exterior

slipping on finish category 1 specimens reflects the use of this finish for jar necks, which when slipped are usually slipped on both sides. Other slipped jars are reflected in the finish category 9 figures, while exteriorly slipped bowls and open forms occur in finish categories 5, 6, 7, and 9. Interior-only slipping is not found in the Paste 3 first construction episode sample, and only infrequently in the second construction sample.

Carbonized Paste 3 sherds are extremely rare. Only two examples were found, and as both are body sherds, they provide no information on possible vessel shape. Both have wiped finishes, one from category 1, the other from category 9. One of the sherds has a sooty deposit on the interior with a blackened exterior face, and the other is carbonized on the exterior only. In general, it appears that Paste 3 vessels, at least as they were employed at Tumatumani, were not a class of domestic cooking ware but rather were restricted to jars, bowls, and fancier decorated ceramics.

Shapes

Only a small number of Paste 3 shapes can be defined from the Tumatumani data, reflecting both

the limited range of vessels found at the site and the smaller diagnostic sample available to define them. Almost all Paste 3 rims and bases are oxidized or incompletely oxidized; jar necks are the only vessel shape with superficially reduced examples, although these form a minority.

JARS (Figs. 70–74)—The largest sample of rim sherds for the Paste 3 shapes is a group of everted or slightly everted rims that have been classified as jars. Only one example (Fig. 71) has a flat lip shape; all others have rounded lips, often with an indeterminate or exterior medial thickening. Diameters of these vessels range from 11 to 18 cm, with an average of 14 cm. Diameters of the slightly everted rims tend to fall at the lower end of the range.

Finishes on Paste 3 jar necks always consist of an even parallel horizontal wipe on both sides, in the majority of cases from category 9, although some category 1 examples are found. Occasionally the interior has a slightly more even finish. The characteristic switch to a vertical scrape or burnish below the neck joint, such as is found on Paste 1 examples, does not occur on Paste 3 rims, even on those sherds large enough to preserve a fair section of the wall. The majority of rims have a light brown, light reddish brown, light gray-brown, or orange-brown unslipped surface color. Only two of the ten examples are slipped, one light brown and the other red-brown, on both faces. Like the Paste 1 examples, these necks occasionally had embellishments, consisting of diagonal or punctate incisions, at the joint between neck and body (Fig. 74). No fillet or appliqué examples were found, or any rim-to-body strap handles. All Paste 3 handles encountered in the excavations are horizontally or vertically oriented strap handles located on the body of the vessel. The majority of these probably belonged to the jars described here, although some may have come from other forms.

MISCELLANEOUS RIMS (Figs. 75–77)—The Paste 3 sample includes a number of single example or unclassifiable shapes. The first is characterized by its distinctive rim, which is exteriorly thickened and somewhat rectangular in profile, forming a band of 2–3 cm around the rim of the vessel (Fig. 76). Diameters of the two examples known are 14 and 18 cm. Both examples are finished with a category 9 wipe on the interior and exterior; one has in addition a red-slipped exterior. These rims very likely belong to tall-necked jars, but the possibility of a straight-sided bowl shape cannot be discarded.

Another possible bowl is illustrated in Figure

77. Only two examples are known of this type. Of the two, Figure 77 is slightly more vertical in orientation. These rims have a category 9 wipe on the exterior and a category 1 wipe on the interior, which in both cases is slightly more even in contour. One has an exterior red slip. Diameters are 14 and 22 cm. The rim sherd illustrated in Figure 75 is perhaps the most important of the undecorated Paste 3 pieces. It is a single scallop from the rim of a straight-sided, slightly flared vessel, probably an *incensario* shape. The diameter of the vessel is approximately 18 cm. The sherd is well finished, although an unslipped red-brown, with a category 3 complete coverage low luster vertical burnish on the exterior and a low luster horizontal burnish on the upper 3 cm of the interior.

BASES (Fig. 78)—Paste 3 bases are flat and similar in profile to Paste 1 bases. Exterior finishing, whether wiped, scraped, or burnished, is always horizontal and, in contrast to the Late Sillumocco Paste 1 examples, is uniform down to the joint between wall and base. One ring base fragment (Fig. 78) was also found. It has a horizontal category 9 wipe on both faces, an unslipped light brown exterior, and a light red-slipped interior. The ring itself is almost vertical in orientation. No thickened edge bases exist in the Paste 3 sample.

Dating the Paste 3 Undecorated and Monochrome-Slipped Ceramics

A similar problem arises in trying to date the Paste 3 plainwares as was encountered in dating the Paste 1 wares. The presence of these sherds in the first construction fill gives them either an Early or Late Sillumocco date. Using the same process of reasoning as was applied to the Paste 1 assemblage, the distinctiveness of the Paste 3 vessel shapes, finishes, and firing practices from the Tumatamani Early Sillumocco Chiripa-related wares would indicate that they belong to a different period in the Tumatamani ceramic sequence. A comparison of the Paste 3 assemblage with other ceramic sequences in the Lake Titicaca Basin indicates a relationship to both Qeya and Qalasaraya ceramics. This would place the Paste 3 assemblage in the Late Sillumocco period and would make it roughly contemporary with the Late Sillumocco Paste 1 group. As with Paste 1, scallops from undecorated *incensarios* (Fig. 75) are found in the sample, indicating the existence of a scalloped *incensario* shape in the Paste 3 assemblage and re-

lating this assemblage to the Qeya period. Painted Qeya-related ceramics (Fig. 155) were also produced in Paste 3. However, Paste 3 ceramics exhibit certain similarities to Qalასasaya (Tiwanaku I) ceramics not found in the Paste 1 sample. This suggests that at least some of the Paste 3 ceramics are slightly earlier than the Paste 1 examples or were manufactured in an area with closer ties to the Qalასasaya sequence. The ring base found in the Paste 3 sample, for instance, is vertical in orientation, in contrast to the flaring rings of Paste 1 specimens. Vertical rings are found only rarely on Qeya *incensarios* but occur on all examples of Qalასasaya ring-based shapes (Ponce Sanginés 1971: Figs. 2-2,5,21,23). The thickened rim illustrated in Figure 76 also can be compared to Qalასasaya ceramics. This rim is distinctive at Tumatumani but bears a resemblance to a similar rim on a tall-necked jar in the Qalასasaya assemblage (Ponce Sanginés 1971: Fig. 3-1; Boero Rojo 1980: 279), suggesting that the Tumatumani example is indeed from a tall jar rather than a straight-sided bowl.

In characteristics of surface color and slip, the Paste 3 ceramics are also similar to Qalასasaya period wares. Unincised Qalასasaya ceramics are characterized by simple red bands on a light brown slip (10YR 6/4), or are an unslipped dark yellow-brown, reddish brown, or dark gray (Ponce Sanginés 1971: 11-12; Bermann 1990: 117). Unslipped Paste 3 plainwares occur in the same color range, and of all the Tumatumani pastes, the slipped Paste 3 sherds are the most likely to have light brown slips in the 5YR and 7.5YR range and are the only group to have a significant number of sherds slipped yellow-brown in the 10YR range, like the Qalასasaya ceramics. The Qalასasaya wares are said to have a light orange-brown paste or a paste similar to color to the light brown slips (Bermann 1990: 462; Ponce Sanginés 1971: 18). Paste 3 wares are also in the majority fired light brown, as opposed to the more commonly found red-browns and blacks of Paste 1. Other aspects of the plainwares are not comparable: the wiped, grainy appearance of Paste 3 plainwares is unlike Qalასasaya finishes, nor is it likely that there is a great similarity between Paste 3 itself, with its dense white inclusions and scarce mica, and Qalასasaya pastes, which are characteristically mica-tempered (Ponce Sanginés 1971; Bermann 1990; Albarracín-Jordan and Mathews 1990: 58). However, among the most common decorated ceramics in Paste 3 are incised specimens that share certain similarities with Qalასasaya decorated wares.

The dates of the Qalასasaya phase at Tiwanaku

are still unclear. Since it is possible that Qalასasaya is in part contemporary with Chiripa Mamani in the earlier phases of its development, any Qalასasaya-related Paste 3 plainwares might be contemporary with the early phase of the Qalასasaya sequence rather than the later, and thus date to the Early Sillumocco period at Tumatumani. Because Qalასasaya and Chiripa ceramics have not been found in association (Bermann 1990: 85; Albarracín-Jordan and Mathews 1990: 187), it is difficult to clarify their relationship. However, the radiocarbon dates associated with the Qalასasaya ceramics illustrated by Ponce Sanginés (1971), to which the shapes of the Paste 3 ceramics are compared, indicate that these vessels date to the later part of the Qalასasaya period. This, plus the internal evidence at Tumatumani, which implies a successive tradition of fiber-tempered and non-fiber-tempered ceramics, suggests that the bulk of the Paste 3 ceramics can be placed in the Late Sillumocco period.

Tiwanaku Period Paste 3 Undecorated and Monochrome-Slipped Ceramics

The Paste 3 ceramics described in this section are believed to date to the Tiwanaku period. Like the Paste 1 assemblage, they are identified principally by the presence of category 10 and 11 finishes on their surfaces. However, as was the case for the Paste 1 ceramics, at least some of the earlier vessel shapes and finishes of Paste 3 probably continued to be manufactured in Tiwanaku times. Although these sherds cannot be identified on an individual basis, the rim and body sherds from the earlier finish categories 1-9 found in the second construction fill exhibit a sufficient number of differences from those of the first construction fill (see Tables 4 and 6) to imply that at least some of these sherds were made in Tiwanaku times and that the differences are due in part to changes in ceramic technology that occurred in the Tiwanaku period. The percentage of blackwares, for instance, drops considerably in the second construction fill, with redwares becoming more prevalent than blackwares. The number of sherds from finish categories 2, 3, 6, and 7 also drops, implying that these finishes were used less frequently or perhaps not at all in second construction times. The Tiwanaku period finishes probably consisted mostly of categories 1, 5, and 9, as well as the new ad-

ditions of 10 and 11. Burnishing patterns, however, remain the same within the first and second construction fill samples: burnishing occurs predominantly on the exterior of specimens from both fills, with a few examples burnished on both sides. Unlike the Paste 1 sample, interior-only burnishing is very rare in Paste 3 sherds in the second construction fill, occurring on only one specimen, a finish category 5 body sherd.

The use of slip in general increases in the second construction episode sample. Finish categories 5, 6, 7, and particularly 10 are represented by the greatest numbers of slipped sherds, followed by finish categories 1, 9, and 11. There are no slipped sherds in categories 2 or 3, nor are there any in the first construction episode sample. Finish category 5 shows the most marked increase in slipping, while the percentage of slipped sherds in finish category 7 actually decreases. The total sample of sherds in category 7, however, is particularly small and does not form a sufficient base for analysis. Red slips continue to be more popular than brown slips in the second construction episode sample, but the percentage of brown slips does increase. In contrast to the Paste 1 assemblage, the earlier finish categories 1–6 also show an increase in the use of brown slips, although categories 10 and 11 still show a larger percentage of brown-slipped sherds than the earlier finish categories. Interior-only slipping is again rare, occurring on only two category 5 sherds. In their lower percentage of blackwares and an increase in the use of brown slips, the Paste 3 plainwares are more similar to the Tiwanaku utilitarian wares described by Girault (1990) than are the Paste 1 ceramics.

Shapes (Figs. 79, 80)

All Tiwanaku period Paste 3 rim sherds, both the two examples illustrated and smaller sherds whose shape could not be identified, have rounded rims and burnishes that, when burnish direction could be determined, were applied horizontally on both the interior and exterior faces. All pastes were fired to an oxidized red-brown color or were incompletely oxidized to a red-brown with a dark core. Diagnostic shapes for the Tiwanaku period Paste 3 undecorated and monochrome-slipped wares include only two vessel forms. One of these (Fig. 79) is apparently a relatively straight-sided shape with a slightly flared rim, perhaps a cup, bowl, or tall-necked jar. It is slipped red on the

exterior and on the interior of the rim and burnished to a medium luster with a category 11 finish. The other specimen (Fig. 80) is probably from the neck of a small jar or bottle. It is slipped light orange-brown and finished with a category 11 burnish on both sides.

Paste 5 Undecorated and Monochrome-Slipped Ceramics

The Paste 5 group is the most common of the fiber-tempered pastes at Tumatamani. However, vessel shape, surface color, and slip are distinct for the high-fiber and reduced-fiber versions of this paste and must be addressed separately. Ceramics of the high-fiber version of Paste 5, as well as those of Pastes 6, 7, 8, and 9, are believed to be contemporary with ceramics of the Chiripa culture in Bolivia and thus to date to the Early Sillumocco period in the Tumatamani sequence. The relation of the Tumatamani fiber-tempered ceramics to those from Chiripa is based not only on the shared characteristic of fiber temper, typical of Chiripa ceramics, but also on the marked similarity in vessel shape, finish, and decorative style between Tumatamani fiber-tempered decorated ceramics and specimens from the site of Chiripa itself (see pp. 53–54). The fiber-tempered plainwares manufactured at Tumatamani in these same pastes are assumed to be contemporary with the decorated ceramics and also to date to the Early Sillumocco period. This assignment is reinforced by the numerous similarities between the Tumatamani fiber-tempered plainwares and the Chiripa plainwares. There are fewer published examples of Chiripa plainwares than of the decorated ceramics, making comparisons more difficult, but a number of shared characteristics can be identified.

Overall similarities between the Tumatamani fiber-tempered plainwares and those from Chiripa are evident in several aspects of vessel technology. The majority of Chiripa plainwares, for instance, are brown (Mohr 1966: 139; Bennett 1936: 439; Browman 1980: 110). Unslipped plainware specimens in all the fiber-tempered pastes at Tumatamani are also principally brown. Like Chiripa ceramics (Mohr 1966: 92; Albarracin-Jordan and Mathews 1990: 58), Tumatamani fiber-tempered plainwares are almost uniformly burnished, in contrast to the many wiped specimens in the non-fiber-tempered pastes. Similarities in plainware vessel shapes can also be found. Straight-sided

bowls with direct or thickened rims and direct-rimmed jars and *ollas* dominate the vessel shape assemblage at Chiripa (Mohr 1966: Table 7) as they do at Tumatumani. Chiripa *ollas* are said to be globular, with a slightly constricted orifice and a rim with differing degrees of flare (Bennett 1936: 439). Rim shapes for both jars and *ollas* at Chiripa can be either direct, exteriorly thickened, or thickened with a triangular profile (Mohr 1966: 37). Tumatumani jars and *ollas* are found with the first two of these rim shapes and are directly comparable to the examples illustrated from Chiripa (Mohr 1966: Figs. 9, 10a, 12, 27a). The characteristic Chiripa vertical straight-sided bowl, which occurs in both plain and decorated versions at Chiripa (Bennett 1936: 439, Figs. 27m,o, 28i; Wiley 1971: Fig. 3-54; Layman and Chávez 1966: 224), is also found at Tumatumani in plain (Fig. 85) and decorated (Figs. 113–115) examples. These straight-sided bowls can also be flared in profile (Layman and Chávez 1966: 225; Ponce Sangines 1970: Fig. 27) (Figs. 95, 116–118). As at Chiripa (Mohr 1966: 37, Figs. 5–8, 17, 18, 23), straight-sided bowls at Tumatumani occur with both direct (Figs. 105, 116, 117) and thickened (Figs. 113–115) rims. A further shared form is the open bowl with slightly convex sides (Bennett 1936: 443, 449) (Fig. 106).

Details of vessel shape offer further opportunities for comparison. Rectangular or oval body lugs, for example, which occur at Chiripa only on the plainwares (Bennett 1936: 439; Mohr 1966: 102, Figs. 39l,m; Albarracin-Jordan and Mathews 1990: Fig. 6a lower left) are also found at Tumatumani, where they occur on both plain and decorated wares in Paste 5, while circular lugs (Mohr 1966: Fig. 39k) occur in Pastes 5 and 9 and on one Paste 5 decorated specimen (Fig. 121). Rim-to-body handles on *ollas* (Bennett 1936: 449; Mohr 1966: 101) are also shared by the two assemblages. Finally, the typical Chiripa exteriorly thickened rim (Bennett 1936: Figs. 27a,h,k,m; Mohr 1966: Figs. 5–8) can be found at Tumatumani on both plain and decorated wares.

Surface Color and Slip— Early Sillumocco Paste 5

All rim and base sherds as well as all body sherds of the high-fiber Paste 5 are burnished on one or both faces and are always finished from category 8. Forty-two percent of the body sherds are slipped,

a much higher percentage than in the reduced-fiber version. Red slips, the most common, are 10R 3-4/6, 4/8 or 2.5YR 3/4-6; brown slips are usually a dark brown 5YR 3/2-3 color. In the unslipped group, a dark or very dark brown surface color is the most commonly found, forming 74% of the unslipped sample. Other unslipped sherds have a red-brown surface color, usually achieved by cooling the vessel after firing. Fiber voids are often visible on the surface of the sherds but are not as abundant as on Paste 7 and 9 specimens.

Shapes

Diagnostic shapes for the high-fiber Paste 5 assemblage include jars, *ollas*, straight-sided bowls, and incurving bowls. Technologically, the assemblage is fairly uniform. Rim and base specimens have a red-brown surface paste color, mostly cooled, although some oxidized and incompletely oxidized examples are found. All specimens are burnished on both faces, and almost all have an overall red or red-brown slip. Only two diagnostic sherds have brown slips, and only one is unslipped.

JARS AND *OLLAS* (Figs. 81–84)—The most common diagnostic rim sherds found in the higher-fiber version of Paste 5 belong to jar and *ollas* forms. Eight specimens exist in this group. The jars (Figs. 81, 82) have tall, slightly everted necks that curve to a convex body form. Diameters range from 9 to 18 cm. All examples are burnished horizontally to a high or medium luster on both the interior and exterior. Burnishes are of both the complete and incomplete coverage varieties of category 8. These jars show the most variation in the use of slips: one example is slipped brown, one red-brown on the exterior and on the interior neck portion, and one is an unslipped mottled black/dark brown.

Paste 5 *ollas* (Figs. 83, 84) have short necks, either everted or slightly everted, and often with a slight interior thickening at the lip. The joint with the body of the vessel is generally at a more acute angle than in the jar group. In more than half the sample, these vessels have an oval or squared oval rim-to-body strap handle. These handles are 2–3 cm wide. All examples are slipped red or red-brown and burnished horizontally to a medium or high luster on the exterior and the interior wall of the neck. The interior of the vessel itself has a wiped surface. Diameters range from

9 to 17 cm, with the majority in the 9–10-cm range.

STRAIGHT-SIDED BOWLS (Fig. 85)—Two specimens were found of a bowl with straight, almost vertical sides and an exteriorly thickened rim. They are slipped red or red-brown on both sides and have a high luster, somewhat incomplete coverage horizontal burnish on the exterior, and a similar low or medium luster burnish on the interior. Diameters are 18 and 26 cm. The example illustrated represents something close to the complete vessel height for this type. Although almost imperceptible in the drawing, it curves in slightly at the bottom, as if broken at the joint with the base.

MISCELLANEOUS RIMS (Fig. 86)—Although they are too small for use in determining vessel shape, rounded exteriorly thickened rims typical of Chiripa wares (cf. Bennett 1936: Figs. 27a,h,i; Mohr 1966: Fig. 5) have been found in the Paste 5 assemblage, slipped red and burnished to a high luster. Published examples of these rims all occur on straight-sided bowls, and it is likely that the Tumatumani specimens also belong to this shape. Finally, one rim specimen was found of an in-curving bowl (Fig. 86). It is slipped red and burnished horizontally to a high luster on both faces.

BASES (Figs. 87, 88)—All bases in the Paste 5 assemblage are flat, but two forms were found to occur. The first (Fig. 87) has straight, nearly vertical-sided walls and is probably the base for the straight-sided bowl shape. Diameters range from 12 to 18 cm. These bases are slipped red and have a medium luster horizontal burnish on both sides. Both finish and slip reach to the bottom of the vessel wall on the exterior. The other base type (Fig. 88) appears to belong to a more convex-sided vessel. Diameters are 16 and 18 cm. The bases are burnished on both sides to a low or high luster and are slipped on the interior and exterior or on the exterior only.

LUGS AND SPOUTS (Fig. 89)—Two examples were found of lugs located on the exteriors of Paste 5 body sherds. Judging from their small size, they appear to be decorative rather than functional. One is a narrow horizontal ridge at least 4.5 cm long (the piece is broken), the other is a circular button 1 cm in diameter. The most unusual example in the Paste 5 assemblage, and indeed the only one of its kind at Tumatumani, is illustrated in Figure 89. It is a trough-shaped spout with a protruding lip from a surface sherd at the site, unfortunately now somewhat eroded. The perforation for the spout opening is made at a diagonal angle, and the lower lip is cupped and projects outward for directing and pouring liquids from the vessel. The spout had an interior opening of approximately 1.5 cm and is located just below the rim of a large (21-cm) straight-sided bowl. Both the interior and exterior of the vessel are slipped red and burnished horizontally to a medium luster. To my knowledge, this is the only published example of an open projecting lip spout on a Chiripa period vessel, although a similar spout, found on a Tiwanaku shape, has been illustrated by Girault (1990: 218).

ration for the spout opening is made at a diagonal angle, and the lower lip is cupped and projects outward for directing and pouring liquids from the vessel. The spout had an interior opening of approximately 1.5 cm and is located just below the rim of a large (21-cm) straight-sided bowl. Both the interior and exterior of the vessel are slipped red and burnished horizontally to a medium luster. To my knowledge, this is the only published example of an open projecting lip spout on a Chiripa period vessel, although a similar spout, found on a Tiwanaku shape, has been illustrated by Girault (1990: 218).

Surface Color, Slip, and Vessel Shapes— Late Sillumocco Paste 5

Ceramics of the reduced-fiber version of Paste 5 generally date to the Late Sillumocco and Tiwanaku periods at Tumatumani, although a small number of Early Sillumocco Qaluyu-related decorated ceramics were manufactured in this paste. Undecorated and monochrome-slipped ceramics in the reduced-fiber version of Paste 5 believed to date to the Late Sillumocco period show marked similarities in vessel shape and finish to the Late Sillumocco Paste 1 assemblage. Sherds of the reduced-fiber Paste 5, particularly the plainwares, were more likely to be found in the first construction episode levels, where they form 39% of the total Paste 5 sample. Their numbers fall to 12% in the second construction levels, while the percentage of the high-fiber version rises, as is the pattern in the early/late mix of the second construction fill, a portion of which was evidently mined from a Early Sillumocco occupation in the area. Because of the similarities in paste composition and surface finish and the lack of fiber voids on their surfaces, sherds of the reduced-fiber version of Paste 5 are often indistinguishable from Paste 1 specimens. The percentages of blackwares, redwares, and slipped sherds in this portion of the Paste 5 sample are comparable to the Paste 1 data. The finishes used on these sherds are those more commonly found on Paste 1 and the other non-fiber-tempered pastes at Tumatumani; most of the sherds in finish categories 5 and 6, and all of those in finish categories 1 and 11, appearing in Table 4 are of the reduced-fiber version of Paste 5. The sample of Late Sillumocco plainware shapes for the reduced-fiber Paste 5 is small but is virtually identical to

the Paste 1 shape vocabulary. Jar necks with vertical strap handles at the rim and a grooved flat lip were found, as well as straight-sided open forms and a large bowl shape similar to Paste 1 bowl A but with a less pronounced thickening at the rim.

Tiwanaku Period Paste 5 Undecorated Ceramics

Vessels of the reduced-fiber version of Paste 5 were also manufactured during the Tiwanaku period at Tumatumani, as demonstrated by the discovery of a number of Tiwanaku-style decorated sherds in this paste (Figs. 162–165). Unfortunately, no diagnostic sherds were found in the sample to define possible contemporary Paste 5 utilitarian wares. Perhaps this version of Paste 5 was used in the Tiwanaku period only for decorated ceramics. From the small percentage of reduced-fiber Paste 5 sherds in the second construction episode fill, this was likely the case. However, if utilitarian wares were manufactured, they were, like their Late Sillumocco counterparts, probably similar to Tiwanaku period Paste 1 utilitarian wares. Information from the sample of body sherds shows that reduced-fiber Paste 5 sherds occur in the second construction fill in finish categories 1, 5, 6, and the late finish category 11. In addition, the second construction level figures reflect changes comparable to similar trends that occurred in the Paste 1 plainwares in Tiwanaku times: a drop in the percentage of blackware sherds, a corresponding increase in the percentage of redware oxidized sherds, and an increase in the total number of slipped sherds.

Paste 9 Undecorated and Monochrome-Slipped Ceramics

Paste 9 is the only other paste group yielding enough examples of plain or monochrome-slipped wares to allow a discussion of shape categories. Like the high-fiber Paste 5 specimens, Paste 9 plainwares are believed to date to the Early Sillumocco period at Tumatumani. All Paste 9 body sherds and rims are burnished on one or both faces, and only one specimen, a body sherd, has a burnish from other than category 8. Burnishes tend to be of a medium or high luster, although some low luster examples are found. Fiber voids

are often visible on the surface of the sherds. Paste 9 sherds are equally as likely to be slipped as not, but slipping, when it does occur, is usually brown (5YR 4/5, 7.5YR 2/2, 4/4, and 10YR 4/4), in contrast to the predominantly red-slipped Pastes 5 and 7. The occasional red slip can be either 10R 4/6 or a more red-brown 2.5YR 3/4 or 4/6. Of the unslipped wares, body sherds with a black or dark brown surface color are more common than those with a red-brown or light red-brown color.

Shapes

All rims and bases in the shape sample are slipped and burnished on both sides, and all have red-brown or light brown surface colors, mostly achieved by cooling. The range of shapes in the monochrome-slipped ceramic sample is similar to that of the Early Sillumocco version of Paste 5, including jars, *ollas*, and straight-sided bowls. Paste 9 *ollas*, however, with their unthickened rims, are more similar to Paste 7 *ollas* (Fig. 17) than those in the Paste 5 assemblage. Incurving bowls are not represented in the Paste 9 sample, but a new shape, a flared bowl, does occur.

JARS AND OLLAS (Figs. 90–93)—Paste 9 jars and *ollas* are generally large, with diameters ranging from 13 to 25 cm. All rims are rounded and without thickening. Necks of the Paste 9 *ollas* are short and vertical in orientation, while those of the jars (Figs. 92, 93) are slightly taller and everted or slightly everted in profile. Specimens are slipped brown, dark brown, or reddish brown on both faces and are finished with a complete or slightly incomplete horizontal category 8 burnish of medium or high luster. The interiors of the vessels, even below the neck section, are also burnished, at least as far down the interior wall as is preserved in the sample. One specimen (Fig. 91) still preserves a complete vertical strap handle, 2.1 cm wide, extending from just below the rim to the upper body wall.

STRAIGHT-SIDED BOWLS (Figs. 94, 95)—Two categories of Paste 9 bowls were found at Tumatumani. The first (Fig. 94) is straight-sided with a vertical or slightly flaring wall and a slight interior beveling of the rim. Diameters are large, 23 and 28 cm, in the two examples found. They are slipped brown on both faces and are finely burnished with horizontal strokes on either side. One example has a medium luster, the other has a medium luster exterior and a high luster interior. The other bowl form (Fig. 95) also has straight-sided walls but is

more flared in profile. The one example known is slipped brown and burnished horizontally to a high luster on the exterior and a medium luster on the interior.

MISCELLANEOUS—No Paste 9 bases were found at Tumatumani, but, judging from the other fiber-tempered examples, they were probably flat. One exteriorly thickened rim of a type illustrated by Bennett (1936: Fig. 27a) was found in the Paste 9 sample. Again, it is too small to determine vessel shape, but probably belongs to a straight-sided bowl. The Paste 9 sample also includes one example of a decorative circular lug on an unslipped dark gray body sherd.

Incised and Polychrome-Painted Ceramics from Tumatumani

In contrast to the previous discussion of undecorated and monochrome-slipped wares, grouped according to the paste in which they were manufactured, the decorated ceramics from Tumatumani are discussed according to identifiable cultural styles or similar decorative techniques. The particular pastes from which the sherds are made are referenced under each subheading where applicable. Most of the decorated sherds come from the surface collections at Tumatumani, with only a minority from the excavation fill units. Consequently, there is no stratigraphic archaeological evidence that can be used to link the sherds under each subheading together as contemporary. In fact, many of the groups probably contain sherds from different phases of the stylistic traditions to which they are presumed to belong, but the phases cannot be distinguished with available evidence. Thus, the sherds are grouped for discussion solely on the basis of shared cultural and stylistic features.

Early Sillumocco—Qaluyu Incised and Painted Ceramics (Figs. 96–104)

Incised and painted ceramics sharing stylistic features with ceramics from Qaluyu are found only in small quantities at Tumatumani and in a limited range of shapes, decorative techniques, and motifs. No Qaluyu everted “shelf” rims (Lumbreras and Amat 1968: Fig. 1d), neckless *ollas* (*ibid.*: Fig. 1e) or exteriorly thickened rims with the point of maximum thickness at the lip (*ibid.*: Figs. 1b,g,h) occur at the site, nor were any vessels found that could be identified as Qaluyu or Qalu-

yu-related plainwares. Seventeen of the 18 identifiable Qaluyu-related sherds found are of Paste 1, the reduced-fiber version of Paste 5, or Paste 6, indicating local manufacture. The only nonlocal sherd is of Paste 4. Although these Qaluyu-related vessels were made locally during the Early Sillumocco period at Tumatumani, there is otherwise little Qaluyu influence at the site; the Juli area during this period belonged more to the southern Titicaca Basin tradition, with stronger ties to Chiripa, and with the majority of domestic and decorated ceramics showing influences from the south.

Qaluyu-related Early Sillumocco decorated ceramics show a remarkable degree of homogeneity in shape, decorative style, and finishing techniques. All examples are slipped and burnished on both sides. Burnish is from categories 6 and 7. It is always horizontal and usually of medium luster. The fiber-tempered sherds in Pastes 5 and 6 have few or no fiber voids on the surface and little fiber in the paste; indeed, superficially they do not appear to be fiber-tempered. Vessels were always fired to achieve a final red-brown or light brown surface color, either through complete oxidation, incomplete oxidation, or cooling. All rim sherds in the group come from the same vessel shape—a straight-sided, slightly flared, presumably always flat-bottomed bowl with a diameter range of 18–27 cm. Rim shapes are limited; the majority are thickened on the exterior with a medial point of maximum thickness, comparable to one of the rim shapes from Qaluyu (Lumbreras and Amat 1968: Fig. 1i). Significantly, this rim shape is not found on any other group of decorated or utilitarian ceramics at Tumatumani and is exclusive to the Qaluyu-related specimens. A minor rim type in this group is a direct rim without thickening.

Qaluyu-related incised sherds are illustrated in Figures 96–98. They compare very closely with the published examples of this type from the site of Qaluyu itself (Lumbreras and Amat 1968: Figs. 1g,h). All examples are slipped on both sides, and colors range from red (10R 3.5/6) to red-brown (2.5YR 3/4, 4/4-6) and dark brown (2.5YR 3/2). Incisions are U-shaped, 2–3 mm wide, and have a depth of approximately 0.8–1 mm. Figure 96 is somewhat aberrant in its slightly wider incision than the other examples in the group, but its curvilinear design, rim, and vessel shape fall within the parameters of the sample. All illustrated examples are of Paste 1. The one, small Paste 5 specimen has a curvilinear design and exteriorly thickened rim and is notable mostly for the uneven width of its incision.

Painted sherds are illustrated in Figures 99–104. Figures 99 and 100 are Paste 1 specimens, Figures 101 and 102 are Paste 5, Figure 103 is Paste 6, and Figure 104 is Paste 4. Sherds are decorated in black or dark brown (5YR 3/2) on a light background, with a horizontal red border at the rim and a red-slipped interior. The red slips are most commonly 10R 3/6, although 10R 3/4 and 4/6 were also used. Background colors for the exteriors are most commonly light brown (5YR 5/6, 6/5 or 7.5YR 6/5) but also include white (5YR 8/1), red-brown (2.5YR 4/6, 4/8), or brown (5YR 4/4–5, 4.5/4). Motifs consist of checkered elements, narrow and wide crisscrossing lines or lattices, rectangles, and concentric diamonds or chevrons. Vessels are again straight-sided flaring bowls with diameters ranging from 18 to 27 cm. Most rims are exteriorly thickened, but the few direct rims in the Qaluyu-related group are found in these painted versions.

These ceramics from Tumatumani show affinities not only with the painted ceramics of Qaluyu, but also with specimens illustrated by Chávez (1969, 1981) from the site of Marcavalle, near Cuzco. Shared characteristics include the basic color scheme of black designs on a cream, light brown, or otherwise lighter background color and the decorative motifs of lattice, chevron, and checkered elements (Lumbreras and Amat 1968: Fig. 1c,i; Chávez 1969: Figs. d, k, p; Chávez 1981: Figs. 41, 42, 49). One trait that distinguishes the Tumatumani ceramics from those of Qaluyu and Marcavalle, however, is the use of generally darker background colors for the black designs. Both Qaluyu and Marcavalle ceramics have black decoration on what is consistently described as a cream-colored background. The variations of black on brown or black on red-brown found at Tumatumani therefore appear to be unique to the site. Nevertheless, the bulk of the Tumatumani background colors, the light brown specimens, are directly comparable to the Marcavalle and Qaluyu black-on-cream ceramics, since many of the colors defined at Tumatumani as “light brown” are the same as those listed by Chávez (1980: 305) as “cream,” the difference lying only in terminology and not in actual color. While for purposes of comparison the Tumatumani ceramics can be referred to as black on cream or black on light brown, the larger range of colors in the sample should be taken into account.

Further comparisons of the Tumatumani material disclose closer relationships to either the Qaluyu or Marcavalle ceramics. Black on cream

or light brown is the only color scheme in the painted sample at Tumatumani. Black-on-cream decoration at Marcavalle, however, is basically a minor type, second to the more popular cream on brown, and forms only 20% of the painted sherds at its most popular in Phase D (Chávez 1981: 244). In contrast, black or dark brown on cream, as well as red on cream, are the major colors in the Qaluyu palette and are said to characterize this style (Chávez Ballón 1950: 44; Kidder 1956: 29; Rowe 1956: 144). In attributes of vessel shape, the characteristic Tumatumani straight-sided flaring bowl is similar to bowls found in both the Qaluyu and Marcavalle assemblages. However, the Tumatumani bowls have flat bases. This attribute is rare at Marcavalle, where bases of the majority of bowls are convex (Chávez 1981: 137), but is found in all published examples of Qaluyu pottery (Lumbreras and Amat 1968: Figs. 1a,b,d,f; Lumbreras 1981: 85). The characteristic Tumatumani thickened rim occurs in both the Qaluyu and Marcavalle assemblages but does not predominate at either site the way it does at Tumatumani. The Tumatumani sample is more closely related to the Marcavalle assemblage, however, in its universal attribute of a red slip on the interior of the vessel and on the top and exterior rim. A fair portion, 25% in Phase D, of the Marcavalle black-on-cream examples also have this same associated red slip, again found on the top of the rim and extending into the interior (Chávez 1981: 244). Interiors of Qaluyu black-on-cream ceramics are not slipped red but rather are covered in the same cream as the exterior or are unslipped.

It is of some interest that the majority of black-on-cream decorated sherds found at Marcavalle, including those with an associated red slip, were not originally from the site but were manufactured in a nonlocal paste believed to come from near Pikicallepata somewhat to the south (Chávez 1981: 244, 334). Black-on-cream sherds in this same paste have also been found at Taraco (*ibid.*: 334). However, to my knowledge, the Tumatumani examples represent the southernmost reported occurrence of black-on-cream painted sherds with associated red slip, made all the more significant by the fact that all but one of the specimens is locally made. Personal work in the southern Department of Puno, including recent excavations at the site of Camata, near Chucuito, has also consistently turned up locally made black-on-cream ceramics with associated red slip in conjunction with the better known Qaluyu incised wares. Associated red slip itself is not new to the Titicaca Basin, since this same

pattern of red slip on the exterior rim and interior of the vessel is found in Cusipata ceramics from Pucara, believed to postdate and to be in part contemporary with Qaluyu (Mujica 1987). Designs on Cusipata ceramics, however, are executed exclusively in cream on a dark brown or black background color. Although heretofore described in the literature only with reference to the Marcavalle and Pikicallepata assemblages, it is suggested that black-on-cream painting with associated red slip should also be included in the definition of the early ceramic styles of the Titicaca Basin, if not for Qaluyu itself, then for the Qaluyu-related local cultures on the west side of Lake Titicaca.

Chávez's work at Marcavalle makes it possible to locate the Tumatumani sherds approximately in time. Black-on-cream decoration is found at that site in the Late Stylistic Division (Phases B–D) (Chávez 1981: 334). Specifically, lattice motifs in black on cream appear in phase C, and checkered elements not until phase D (Chávez 1981: 339–340). Phases C and D are dated to approximately 800–600 B.C. Tumatumani black-on-cream painted ceramics are likely to be roughly contemporary and can therefore be placed toward the beginning of the Early Sillumocco period, coincident with the later Marcavalle and Qaluyu phases. However, the Tumatumani sequence may differ from the northern chronology, and an earlier or later date is also possible.

Early Sillumocco—Chiripa Incised and Painted Ceramics (Figs. 105–122)

The incised and polychrome-painted ceramics described here exhibit certain features that compare closely with the sherds illustrated by Bennett (1936) and Mohr (1966) from the site of Chiripa. Most of the Tumatumani examples, however, are manufactured in the local Pastes 5 and 6, while the Paste 9 specimens show sufficient differences in style and technique from the illustrated examples to suggest that they were not made at Chiripa itself. Rather, the Tumatumani decorated Chiripa-related ceramics are local or semilocal, Early Sillumocco versions of the Bolivian Chiripa ceramic style. Browman (1980: 111) states that the examples published by Bennett and Mohr date to Chiripa Mamani Phases A and B, the last of his four-phase division of the Chiripa sequence. The similarity of most of the Tumatumani wares to these examples implies that the majority of the sample dates to later in the Chiripa sequence rath-

er than earlier, placing it principally in the later part of the Early Sillumocco period. However, narrow line incision, black-on-red designs, and carefully executed rectilinear designs, which are said to occur with more frequency in the earlier Chiripa Llusco phase (Browman: 1980), are also present at Tumatumani, suggesting the possibility of a Llusco-related occupation at the site beginning early in the Early Sillumocco period. Certainly the Qaluyu ceramics described in the previous section are testimony to the occupation of the Tumatumani area during the earlier part of the Early Sillumocco period. Because the southern basin influence, including that from Chiripa, is generally stronger in the Tumatumani ceramics than influence from northern areas such as Qaluyu, one would reasonably expect to find contemporary—i.e., Llusco phase—Chiripa-related ceramics at the site. However, without more stratigraphic excavation in the southwestern basin and the definition of a local chronological sequence for the Chiripa-related ceramics in this area, it is impossible to determine the exact chronological position of the Tumatumani ceramics at this time, or to distinguish between temporal differences and the peculiarities of local styles in the variation demonstrated by the Tumatumani sample.

Incised Chiripa-related ceramics at Tumatumani exhibit considerable variation in slip color and incision technique. Finish and firing techniques on the other hand, are fairly standardized. Eleven of the 13 examples have a high luster horizontal category 8 burnish on both sides (the others have a medium luster burnish), and 10 of the 13 were cooled after firing to produce sharp red-brown interior and exterior edges. Single examples exist of oxidized, incompletely oxidized light brown, and gray pastes. The majority of the incised examples are painted in two or more colors, most often with an overall red slip (10R 3-4/6) applied to both faces of the vessel and with additional colors painted over the red.

Incised specimens are found in Pastes 5, 6, and 9. Paste 5 examples form the largest percentage of the sample and show the greatest amount of variation. Incisions on Paste 5 sherds can be a very narrow and shallow line, more like a tracing made with a stylus than an incision; a wide, U-shaped incision of 2.5–3 mm; or a medium-width incision of 1–2 mm. The stylus line-incised group (Fig. 107) exhibits the most standard Chiripa color scheme (cf. Bennett 1936: Figs. 27i,j,n; Mohr 1966: Figs. 26d,e): black and yellow (7.5YR 6/6-8) on a red base slip, although the use of such a narrow

incision is probably a local Juli variation. The rim shape of Figure 107 is also very similar to one of Bennett's (1936: Fig. 27k) specimens. The wide-line incised examples are less like the ceramics from Chiripa. They are painted in two, not particularly contrasting colors: one example is red on a reddish brown (2.5YR 4/6) interior and exterior base color, the other (Fig. 108) is painted red and light brown (7.5R 5/4) with no base red. This sherd has an unslipped red-brown interior and only a medium luster burnish. The medium-width incised Paste 5 sherds also exhibit an unusual range of colors: black and yellow on red occurs (Fig. 109), but also dark red (10R 3/2) and yellow on red (Fig. 105), grayish white (10YR 7/2) on red, light brown (7.5YR 7/4) on dark red, red and light brown (10YR 6/4) without a red base slip (Fig. 110), and monochrome-slipped brown (Fig. 106). The rim sherds in this medium-width incised group include specimens from a slightly convex-sided bowl (Fig. 106), mentioned by Bennett (1936: 443) as occurring at Chiripa, as well as a straight-sided form with a direct rim. Like most Chiripa bowls, these examples have large diameters. Monochrome-slipped incised ceramics, such as the one illustrated in Figure 106, are a minor type at Tumatumani, as they are evidently also at Chiripa (Bennett 1936: 441; Mohr 1966: Table 22).

The Paste 9 incised ceramics are considerably different from the Paste 5 examples. Incision is of medium width but the edges are jagged, as if executed on a dry clay surface. Burnishing reaches only a medium luster. The inward curve at the bottom of Figure 111 suggests that the sherd comes from near the vessel base. This sherd is slipped red on one side of the incision and dark red (10R 3/3) on the other, without any base slip. The interior is slipped red. Figure 112 is decorated in black over a red slip, but is unslipped on the interior. The one Paste 6 incised sherd (Fig. 113) has a medium-width incision, slightly wider, deeper, and more even than the Paste 5 examples. The interior and thickened rim portion of the exterior are slipped red; below the rim on the body of the vessel is a red slip streaked with black. Burnish luster is high on both sides. The sherd is from a vertical-sided bowl with an exteriorly thickened rim.

The majority of the 21 Chiripa-related painted sherds are decorated in cream or yellow on a red interior and exterior base slip. As a whole they form a more homogeneous group than the incised ceramics and resemble fairly closely the published examples from Chiripa. Yellow-on-red painted

sherds are found in Pastes 5 (Figs. 114–116), 6 (Fig. 118), and 9 (Fig. 117), with no major differences in shape or decoration between the different pastes. The red slips are all in the Munsell range 10R 3-4/6-7; designs are painted in cream (10YR 8/4, 7.5YR 8/4), yellow (7.5YR 6/7, 7/6), or yellow-orange (5YR 5/8, 6/6). All examples but one are slipped red on the interior. Three of the Paste 5 body sherds are exceptions to this color range as they display darker, more brownish reds and more intense yellow slips than the rest of the group. Sherds are generally burnished horizontally to a high luster on both sides. Exterior designs are all geometric, although some have sharper lines and more angled corners than others. A few of the rim sherds have interior decoration as well, pendant triangles being the only recognizable motif (cf. Bennett 1936: Figs. 27m,o, 28i). Vessel shapes for these yellow-on-red ceramics include straight vertical-sided bowls with exteriorly thickened rims as well as a straight-sided, more flaring bowl shape with a direct or only slightly thickened rim. Vessels are large, with diameters ranging from 18 to 30 cm. One example of a painted body lug was also found.

Aside from the yellow-on-red specimens, two other groups of Chiripa-related painted ceramics were found at Tumatumani. These are less commonly found in the published literature and were also a minority at the site. The first of these occurs in both Pastes 5 (Fig. 119) and 9 (Fig. 120) and consists of black designs on a red (10R 3/5) or brown (7.5YR 4/4, 5YR 4/5) slipped background or an unslipped red-brown background. Interiors are an unslipped reddish brown or a slipped dark brown. Designs are rectilinear only and appear to consist mostly of stripes. The similarity of these designs to those on some of the Paste 9 jagged-edge incised wares is noticeable. Fewer of these sherds have high luster burnishes, but otherwise surface finish is the same as the yellow-on-red examples. The second of these painted wares (Figs. 121, 122) is found only in the locally made Paste 5 and perhaps is not properly called Chiripa-related, for it appears to bear less relation to the Chiripa wares made in the southern Titicaca Basin than the other specimens from Tumatumani. It consists of red (10R 3/4) designs on a red-brown–(2.5YR 3/6) or red-orange (2.5YR 4/8) slipped background. Motifs are lines and zig-zags. Surface finish is also slightly different from the other Chiripa-related painted wares: burnishing strokes in this case are slightly visible, in contrast to the more common undetectable burnished finish.

Late Sillumocco Polychrome Incised Ceramics (Figs. 123–127)

The majority (six) of sherds in this group are of Paste 3; the rest of the sample consists of two Paste 1 specimens (Fig. 126), apparently less well-finished local versions of the Paste 3 wares, and two, also local, Paste 2 examples (Fig. 127). Sherds are painted in red (7.5R 3/5–8, 10R 3/6), light red (7.5R 4/6) or pink (5R 5/6), white (5YR 8/1), cream (7.5YR 8/4) or yellow (10YR 7/6), and black on an unslipped or light brown (5YR 6/5, 7.5YR 5–6/5) slipped surface. Interiors are slipped light brown in the same color range or are an unslipped light brown or reddish brown. Sherds are burnished on the exterior to a high or medium luster with a category 7 burnish and have interior wipes or scrapes. Only Figure 124 is burnished on the interior. Fired paste color is almost universally light brown, with only one oxidized red-brown specimen in the sample. The two rim sherds in this group both have rounded direct rims and belong to large (20 and 24 cm diameter), slightly convex-sided bowls. Incision techniques vary; the two rim sherds have a narrow, shallow (0.1 mm) stylus-type incision, while the other examples have wider, deeper (0.4–0.7 mm) incisions that can be either U- or V-shaped in profile.

These polychrome sherds were found at Tumatumani in both the first and second construction episode fills as well as on the surface, so archaeological evidence gives us only a pre-Tiwanaku date. However, the attribute of color areas delineated by incision and the decorative motifs found on these sherds are comparable to other non-fiber-tempered polychrome incised ceramics from the Lake Titicaca Basin, e.g., Classic Pucara from northern Puno and Qalasitasaya (Tiwanaku I) from Tiwanaku. If similarity implies contemporaneity, then the Tumatumani specimens should be roughly contemporary with the ceramics of these two cultures. However, while the Tumatumani specimens can be related to both of these ceramic traditions, they are not strictly comparable. No examples of fancy, specifically Pucara iconography, such as felines, birds, running angels, or even trophy heads, have been found at Tumatumani, nor have any motifs, such as profile felines, been found that can be specifically related to Qalasitasaya. It is suggested that the Tumatumani examples are contemporary in some way with both Pucara and Qalasitasaya but are a local or semilocal production from near Juli, belonging to what was

probably a pan-Titicaca tradition of non-fiber-tempered polychrome incised ceramics during the Upper Formative period, a tradition that had a long duration in the Pucara sequence but which was superseded in the Tiwanaku area by unincised painted decoration or simple incision on an unpainted surface at the beginning of the Qeya period.

Specific comparisons of the Tumatumani material with Classic Pucara and Qalasitasaya ceramics can be made with respect to vessel shape and design motifs. The convex-sided bowl with a direct, rounded rim and a decorative band on the exterior border, such as is represented by the two Tumatumani incised rim sherds, occurs in both the Classic Pucara and Qalasitasaya assemblages (Ponce Sanginés 1971: Figs. 3–24,25; Rowe and Brandel 1971: Figs. 54–56). The motifs represented at Tumatumani are fairly simple, consisting of step blocks and rectilinear designs, and are also found in the design repertoires of both Classic Pucara and Qalasitasaya (Ponce Sanginés 1971: Figs. 3–24,25,27–29; Rowe and Brandel 1971: Figs. 49–56). Other comparisons of the Tumatumani material with Pucara and Qalasitasaya specimens reveal a closer relationship to either one or the other. Qalasitasaya incised ceramics are said to have a light brown fired paste color (Ponce Sanginés 1971: 18), as do the Tumatumani examples; Pucara incised wares are fired to a red or red-brown (Franquemont 1990). Also closer to Qalasitasaya ceramics is the use of background colors at Tumatumani. On most Tumatumani specimens colors are applied separately onto an unslipped surface, but in two cases (Figs. 123, 124) design colors are applied onto an overall light brown background slip. Qalasitasaya incised ceramics are also painted on an underlying light brown (10YR 6/4) slip (Ponce Sanginés 1971: 17), while Pucara ceramics, in contrast, are almost always painted on a red background slip color.

In slip colors, the Tumatumani examples show more similarities to Pucara ceramics. Qalasitasaya polychromes are reported to have only red, white, and dark gray decoration (*ibid.*). At Tumatumani, these colors as well as pink and yellow are found, additions that also occur, significantly, in the Pucara palette (cf. Rowe and Brandel 1971: Pl. 1 color key). The reds used in the Tumatumani wares, mostly in the 7.5R range, are also brighter than the 10R colors of the Qalasitasaya ceramics and more similar to Pucara reds. The Tumatumani incised decoration, smaller and finer in scale and executed in narrower incision than the Qalasitasaya

specimens, is likewise more comparable to the Pucara examples.

Both Pucara and possibly Qalzasaya have earlier phases that would be contemporary with the Early Sillumocco period at Tumatumani. The ceramics described here, however, are believed to date to the Late Sillumocco period, based on several lines of evidence. One is the apparent temporal position of the bulk of the non-fiber-tempered ceramics at Tumatumani after the Chiripa-related wares. As regards Qalzasaya, illustrated examples of incised ceramics of this style are known only from the later Qalzasaya period. These vessels were found in burials and offering caches in the lower levels of excavations in the Qalzasaya pyramid at Tiwanaku. Although several radiocarbon samples were taken from the levels in which these burials and caches were encountered, only one is directly associated with the burials themselves (Ponce Sanginés 1971: 18, 1981b: Table 1). The date of this sample is the latest of all those associated with the Qalzasaya sequence and falls within the Late Sillumocco period. Examples of unincised Qalzasaya pottery excavated at Lukurmata have likewise been ascribed a date pertaining to Late Sillumocco times (Bermann 1990: 20). At Pucara, incised polychrome decoration is found in the pre-Classic phases of the site, phases that would be contemporary with Early Sillumocco. Pucara pre-Classic bowl shapes, however, all have beveled rims (Franquemont 1990: Figs. 8–12; Mujica 1987: Fig. 7) and are very unlike the Tumatumani bowls. Bowls with direct rims do not occur in the Pucara sequence until Classic Pucara times. Step block designs are also found in the pre-Classic Pucara repertoire, but when they occur on bowls they are found almost exclusively on the interior of the beveled rim. This is very unlike the exterior decoration of the Tumatumani examples but is an attribute that also occurs on Classic Pucara bowls.

Ceramic Tubes or Trumpets (Figs. 128–133)

Nine fragments of ceramic tubes with grass impressions on their interiors, plus four fragments of tubes without grass impressions, were found at Tumatumani. These ceramic tubes, generally referred to as trumpets (Kidder 1943: 3; Rowe and Brandel 1971: 15; Chávez 1988: 21) are familiar components of the Pucara (Rowe and Brandel 1971: Figs. 71–76; Franquemont 1990: Figs. 61–65; Chávez 1988: Fig. 11) and Chiripa (Bennett 1936: Figs. 28g,h; Mohr 1966: Figs. 43–46; Chá-

vez 1988: Fig. 7) ceramic assemblages, and have also been found at Taraco in the Department of Puno (Kidder 1943: Fig. 5) and in the Tiwanaku area (Ponce Sanginés 1970: Figs. 30-1,2,4; Bermann 1990: Fig. 57c).

Pucara specimens have thickened mouth pieces and a flaring distal end (Muelle and Blas 1938: Pl. 71b; Bennett 1946: Pl. 37c; Chávez 1988: Fig. 11), much like modern trumpets, while southern basin examples generally have less flare (Bennett 1936: Figs. 28g,h). The Tumatumani specimens are all body sherds, but their diameters of 3–6 cm are comparable to the diameters of complete clay tube specimens, and the presence of grass impressions on the interiors of the majority of the Tumatumani examples is a trait associated only with ceramic tubes. These grass impressions have been suggested to be evidence of the use of grass bundle molds to achieve a tube shape (Kidder 1943: 24; Franquemont 1990: 7; Chávez 1988: 23). Many of the published tubes from both the northern and southern basins have sooted or blackened interiors (Bennett 1936: 443; Kidder 1943: 24; Franquemont 1990: 7; Chávez 1988: 21, 23), a trait that does not occur on the Tumatumani specimens.

Figure 128, in Paste 7, and Figure 129, in the Paste 5 higher-fiber version, are the only two fiber-tempered examples in the group and appear to be slightly earlier, Chiripa-related Early Sillumocco in date, than the Paste 1, 2, and 3 sherds. Figure 128 has a gray paste and unslipped surface color. It is burnished to a low luster and decorated with red slip (pre-fire) in the incisions. It is the only grayware example in the collection and as such is comparable to the tubes from Chiripa, most of which are black or brown in color (Chávez 1988: 21). Figure 129, the Paste 5 example, does not have grass impressions on its interior, but its small diameter (3 cm) identifies it as a member of this same ceramic tube group. The modeled and incised design on this sherd appears to be zoomorphic, representing the appendages of some type of animal, and bears a general resemblance to the Chiripa tubes (Bennett 1936: Fig. 28g; Chávez 1988: Fig. 7) and the examples from Taraco, which also display modeled zoomorphic figures on their exteriors. Figure 129 has a red-brown (2.5YR 4/6) slip on the modeled area and to its right, and a brown slip (7.5YR 4/4) to the left. It is finished with a category 7 burnish of high luster in the red-brown-slipped area and medium luster on the brown-slipped portion. The interior is a wiped unslipped light brown, and the fired paste color is black with cooled light brown edges.

The Paste 1, 2, and 3 ceramic tube specimens

form a fairly homogeneous group, with decoration characterized by rectilinear incision and rows of dots. Eight specimens are manufactured in Paste 3. They are slipped light brown (7.5YR 4/4-6, 10YR 5/2.5), including within the incisions, and decorated with shallow (0.2–0.4 mm) U-shaped incisions and punctate dots. Figures 130 and 132 have in addition a pre-fire red slip (10R 3/5, 7.5R 3/6) within the incisions. These two sherds, plus one example not illustrated, are finished with a category 5, 6, or 7 burnish of medium or high luster; the other examples have a faint plastic category 1 wipe. Fired paste color is generally light brown, with some red-brown specimens. The three locally made Paste 1 (Fig. 133) and Paste 2 ceramic tube fragments differ slightly from the Paste 3 group in the use of red or red-brown slips rather than brown and in their uniformly red-brown fired paste color. Two examples are slipped and burnished on the exterior with a category 6 medium luster burnish. Figure 133 is an unslipped red-brown and is finished with a faint plastic wipe. Again, incision is shallow and U-shaped.

The Paste 3 specimen illustrated in Figure 131 stands out from the rest of the Tumatumani specimens as being the only polychrome example and clearly belongs to a different stylistic group. It is decorated with a fine-line incised cross and painted in black, white (10YR 8/3), and red. Incised lines delineate the central square of the cross only at the top and bottom; the sides are marked by the change of color between the black and white slips. Thus, while not a true “checkered cross,” it bears more of a resemblance to the checkered crosses found on Pucara pottery (Rowe and Brandel 1971: Figs. 63, 68, 69) than to the southern basin examples. Chiripa crosses are open with punctate dots at the end of each arm (Bennett 1936: Fig. 28g), while Qeya incised crosses are concentric or have + motifs in their centers (Ponce Sanginés 1948: Fig. 38; Chávez 1985: Fig. 67).

The ceramic tube fragments of Pastes 1, 2, and 3 are believed to date to the Late Sillumocco period. This conclusion is based on the similarity of the incision on these sherds, wide lines and punctate dots, to the Paste 1 Late Sillumocco incised ceramics described in the following section (e.g., Figs. 141, 143, 145). In addition, the faint plastic wipe found on some of the Pastes 1 and 3 tube fragments is identical to the finish on these Paste 1 incised sherds. The resemblance of the incised cross of Figure 131 to Pucara checkered crosses would also indicate a Late Sillumocco date for this unusual specimen in the sample. Their position in the Late Sillumocco period makes the Tumatu-

mani trumpets roughly contemporary with Pucara, Qalasangaya, and Qeya. Although trumpets are known from Pucara, and are found in the Qalasangaya assemblage as well (Ponce Sanginés 1970: Figs. 30-1,2; Bermann 1990: Fig. 57c), no Qeya examples have as yet been identified. If the dating of the Tumatumani trumpets is correct, and given that the Paste 1 Late Sillumocco incised ceramics to which they show the greatest resemblance are related principally to Qeya ceramics, then the existence of these incised ceramic tubes at Tumatumani suggests the possibility that trumpets may be found in the Qeya ceramic assemblage as well.

Paste 1 Incised Ceramics (Figs. 134–146)

The incised ceramics described in this section are all manufactured in Paste 1. Three groups, differing in firing techniques, surface finish, and use of slips, can be distinguished within the larger incised ceramic sample. Group A (Figs. 134–136) is composed of five sherds with dark brown, dark gray-brown, or black surface colors. Pastes are black, or have a red-brown core and thick dark interior and exterior edges. Sherds are incised with a medium-width U-shaped line. Incisions are made over a wiped surface, which generally has a more even contour and a smoother look than the surfaces of the sherds in groups B and C. Unincised areas on group A sherds are clearly set off by incised borders (Figs. 135, 136) and are burnished to a medium or high luster with a complete coverage burnish from categories 5 or 6. Two examples are burnished on the interior as well; the others have a category 1 scrape. Sherds of group A have a minimal amount of slipped decoration; on Figure 136, red post-fire paint (7.5R 3/6) was applied in two of the incised dots, while Figure 135 has a red slip (pre-fire 10R 3/6) in the burnished area and within two of the incised circles.

The six sherds in group B (Figs. 137–139) have black, gray-brown, or gray surface colors and are characterized by being only superficially reduced or smudged, producing a red-brown paste with a very thin interior and exterior dark “rind.” Surface color is lighter than that of sherds in group A, and interiors are occasionally red-brown. Sherds in this group also have more mica visible on the surface than group A sherds. Surface contours are even or slightly irregular, and surface finish consists of a category 1 wipe ranging in appearance from a smoothed look with very faint wiping ridges to a

surface with more prominent wiping marks. Interiors are uniformly scraped. Incisions are of medium width and can be either U-shaped or rectangular in profile. Motifs in this group are generally rectilinear and consist of nested rectangles, squares, and L-shaped elements, incised circles, and fields of punctate dots. Red post-fire paint (7.5R 3/6-7) is found in the incisions of all four examples in this group, while Figure 137 has both red and yellow (7.5R 6.5/8) post-fire decoration. A narrow band of red post-fire paint was also applied on the surface of the sherd shown in Figure 138. All post-fire paints are in a poor state of preservation, and it is likely that the vessels originally had paint in more of the incisions than the sample shows.

The third group of incised ceramics, group C (Figs. 140–146), is distinguished by having slipped surfaces. Five specimens (Figs. 140–143) have red slips (10R 3.5-4/6, 7.5R 3/6) on the exterior and unslipped red-brown interiors, two specimens have a light brown (5YR 5/4, 10YR 6/3) slip on both faces, one (Fig. 144) has a red-slipped exterior and unslipped dark brown interior, and one (Fig. 146) has a cream (7.5YR 7.5/6) slip on both sides. All slips are thin and were applied after incision. The specimen in Figure 145, which has a plain red-brown surface, is the only unslipped example, but its incised decoration is sufficiently similar to the other specimens to justify its inclusion in this group. Motifs include parallel lines, double circles, and triangles or angles with fields of punctate dots or a single dot in their corners. Six of ten specimens have post-fire paint in the incisions; four have both red and yellow paint (Figs. 141, 142, 144, 146), and two have only red. Incisions have U-shaped contours and are generally wider and deeper than the incisions on sherds in groups A and C. One sherd (Fig. 141) exhibits the technique of jab-and-drag or stamped incision; the circle on this sherd was created by pushing the incising tool into the clay, then dragging it in a short arc. Surface finish on the sherds of this group is again a category 1 wipe; surfaces have only very faint wiping marks, and none show marked striations. Interiors are scraped. Most examples have oxidized red-brown pastes or red-brown pastes with an incompletely oxidized core, although very superficially reduced gray edges are occasionally found in the sample.

Groups B and C of the Paste 1 incised ceramics show a noted similarity to a class of incised wares, generally scalloped-rim flat or pedestal base *incensarios*, often with feline heads, found in both the northern and southern Lake Titicaca Basin. They form part of the Qeya assemblage as defined

by Wallace (1957) and were included by Bennett in his corresponding Early Tiahuanaco period (Bennett 1934: 409). Chávez (1985), in an analysis of similar sherds from the Departments of Cuzco and Puno, has likewise assigned her sample a Qeya or Early Tiahuanaco date; incised *incensarios* have also been found in late Qeya contexts at Lukurmata (Bermann 1990: 195, Fig. 77b). Aside from the illustrations found in the studies of Bennett (1934: Fig. 13a), Wallace (1957: Pl. 1c,e), and Chávez (1985: Figs. 1–58, 65–69), examples of complete incised *incensarios* can be found in various other publications (Eisleb and Strelow 1980: Figs. 3–5; Fellman Velarde 1961: Pl. 6; Ponce Sanginés 1948: Figs. 38, 39; Ibarra Grasso 1957: Fig. 74; Bandelier 1910: Pl. 21 left; Means 1931: Fig. 56 lower left and center; Ruben 1952: Fig. 30 left).

Similarities of the Tumatumani sherds to the Qeya incised wares are numerous and specific. Like the Tumatumani sherds, Qeya incised ceramics have unburnished matte luster smoothed surfaces, occasionally with visible striation marks (Wallace 1957: 48; Chávez 1985: 159). Both Wallace and Bennett mention only unslipped examples, but many of Chávez's specimens are slipped. Post-fire paint applied in the incisions of Qeya ceramics is also characteristic. Wallace (1957: 48) noted the colors red, yellow, and white for the Qeya Qollu Chico wares, and Bennett (1934: 409) described the same colors for his material, although he did not specifically state it was post-fire. Further references to the colors red, orange, and white can be found for the southern basin examples (Eisleb and Strelow 1980: 23) and red and white for the northern and southern basin (Chávez 1985: 141; Bermann 1990: Fig. 77b). The Tumatumani palette appears to have been more limited, since neither the white nor orange colors are found at the site. Although the Tumatumani sherds probably do not show complete preservation, Figures 139, 142, and 146 suggest that post-fire paint was applied in alternating colors in the incisions, or perhaps in alternating painted and unpainted incised lines. Alternation of post-fire colors has previously been noted as a characteristic of Qeya period incised ceramics (Chávez 1985: 141). The design motifs on the Tumatumani ceramics also compare well with the published examples of Qeya incised ceramics. Nested rectangles and L-shaped motifs are found particularly in the examples from the southern basin—Tiwanaku, the Tiwanaku area, and Qeya Qollu Chico (Chávez 1985: Figs. 67, 68; Bandelier 1910: Pl. 21 left; Eisleb and Strelow 1980: Fig. 3 [compare especially Fig. 137, this paper]).

Fields of dots within triangles are also found on specimens from this area (Eisleb and Strelow 1980: Fig. 3; Ponce Sanginés 1948: Fig. 38; Chávez 1985: Figs. 65, 66), while parallel lines and circles are found on both southern and northern basin examples (Chávez 1985: Figs. 21, 25, 29, 34).

Some of the specimens from Tumatumani appear to have belonged to the same scalloped-edge *incensario* shapes as those found in the Qeya assemblage. Figure 137, for instance, with its squared rim and straight sides, may have come from one of these vessels, from a portion of the rim without scallops, or from an open, straight-sided incised vessel without scallops or feline head, such as that on view in the Tiwanaku Museum in La Paz. The diameter of this sherd, 12 cm, is comparable to the scalloped versions illustrated by Chávez (1985). Unslipped brown or gray-brown rim scallops have also been found at Tumatumani (Fig. 64), as well as unslipped and red-brown-slipped ring bases (Figs. 58, 59), a base shape generally found on Qeya period scalloped *incensarios*. Figure 140 represents an incised example of one these hollow bases, although the total height of the indented portion of the base cannot be judged. The base illustrated in Figure 138 also approaches the ring type.

The existence of feline head *incensarios* at Tumatumani is evidenced by the sherd illustrated in Figure 147. While somewhat difficult to recognize, this specimen is an abstract version of the feline heads found on scalloped *incensarios* from both the northern and southern Titicaca Basin. As Chávez points out (1985: 149), the position of the head on the body of the vessel, with the rim connecting just below the ears, most closely resembles Qeya period examples; earlier feline heads are entirely on the vessel body, while Tiwanaku heads are entirely above the rim. The sherd has an unslipped dark brown micaceous surface, and while the upper portion is scraped only, there are a few incomplete burnish strokes beginning at about the level of the mouth. This, plus the lack of incisions around the mouth or chin as is common on other feline heads, suggests that the piece was not incised elsewhere on the vessel but had a general overall category 5 burnish. The rim shape, not visible in the illustration, is squared like that in Figure 137.

Although the incised specimens of both groups B and C bear a relation to Qeya period incised ceramics and *incensarios*, some specific geographic comparisons differentiating the two can be made. Group B, the ceramics characterized by having a gray surface color with interior and exterior “rinds”

in the paste, is more comparable to the southern basin incised wares. These too tend to have a tan or gray surface color (Chávez 1985: 151), in contrast to the predominantly red-brown surface colors of the material from the Cuzco–Puno area. They are also more likely to be incised with nested rectangles and L-shaped motifs, as is Tumatumani group B. The most specific comparisons are with the incised *incensarios*, as well as other shapes, from Qeya Qollu Chico in the American Museum of Natural History (New York). Specimens in this collection not only have the same characteristic gray surface color but the same superficially reduced “rinds” visible in the paste cross-section as well. Incisions on some of these pieces also have straight-sided rather than U-shaped contours, a trait found only in group B at Tumatumani.

Group C ceramics, in contrast, share certain similarities to the material studied by Chávez, particularly in the use of slips. Southern basin examples are never slipped, while a fair number of Chávez’s pieces are, including within incisions (Chávez 1985: 144), in the same red, red-brown, and light brown slips as the Tumatumani specimens. U-shaped incisions and a surface finish that shows no or only very faint finishing marks are predominant in the Department of Cuzco wares (Chávez 1985: 155–158) as they are in group C. Jab-and-drag or stamped incision, a particular trait of the Department of Cuzco ceramics (Chávez 1985: 140) and not found in the southern basin examples, is also found on one specimen in group C, where it was used to make a circular motif. The jab-and-drag technique is sufficiently diagnostic to link group C with the northern basin examples. However, it was employed in a slightly different manner at Tumatumani, since jab-and-drag incision in the Department of Cuzco specimens was used only to make straight lines or dashes, while circles were stamped with a hollow stamping tool.

While Tumatumani groups B and C can be provisionally identified as belonging to a Qeya tradition of incised ceramics made locally in the Late Sillumocco period at Tumatumani, group A stands apart. These sherds, it is suggested, are pre-Qeya and perhaps even Early Sillumocco in date. Incised ceramics with post-fire paint have been documented from pre-Classic Pucara levels at Pucara by Kidder (Chávez 1985: 151) and Mujica (1978: 301; Mujica and Wheeler 1981: 51), and in pre-Pucara levels at Taraco (Chávez 1985: 151). I have also found this type of incised ware in pre-Classic Pucara contexts at Camata. All of these ceramics have unslipped black or gray surface colors, which

at least in the Camata examples are of a deeper color and include more of or all of the paste cross-section than the sherds in groups B and C, and closer approximate the group A firing technology. Refining the chronological order of the various local incised wares of the Titicaca Basin, however, is a task still to be completed. The Tumatumani excavations add more examples to the published corpus but cannot resolve the chronological ambiguities at this time.

Late Sillumocco—Qeya Painted Ceramics (Figs. 148–155)

A total of 11 sherds were found at Tumatumani, on the surface and in the second construction fill, that exhibit similarities to the painted ceramics of the Qeya period. Six sherds are manufactured in Paste 10 (Figs. 148–151), making this group the only one at Tumatumani to have a significant proportion of imported examples. The other specimens include two of the local Paste 1 (Fig. 152), two of Paste 2 (Figs. 153, 154), and one Paste 3 example (Fig. 155). Although these sherds share enough features to be discussed jointly, a number of differences separate the Paste 10 specimens from the Paste 1/2/3 sample.

The similarities of the Tumatumani sherds as a whole to the published Qeya ceramics lie principally in characteristics of design motif and slip. Like the Qeya examples (Bennett 1934: 399; Wallace 1957: 19a), the Tumatumani sherds tend to have thick, glossy slips, distinguishing them from the Tiwanaku period sample, which have somewhat thinner slips. The color range of the slips on the Tumatumani specimens is also comparable to Qeya ceramics: black-and-red designs on a cream (10YR 8/3-4), white (7.5YR 8/2, 10YR 8/2), light brown (7.5YR 6/5), orange (2.5YR 5/8), or yellow orange (5YR 6/6) background, or an unslipped light brown or light orange-brown (2.5YR 5/6, 5YR 5/6, 7.5YR 7/5, Fig. 149) background. Red on an unslipped buff, as described by Bennett (1934: 399), occurs at Tumatumani (Fig. 155), as well as polychrome on buff. Qeya polychrome painting tends to occur in panels on the sides of vessels or on the interior rim, with the rest of the vessel remaining unslipped. Although most of the Tumatumani sherds are too small to ascertain if the same design arrangement predominates, the only large piece (Fig. 154) has this same pattern of an unslipped buff area below a design panel. Sherd interiors are always wiped and are generally slipped light brown

or light orange-brown, although unslipped examples occur in the Pastes 1/2/3 group. The painted designs on the Tumatumani sherds, mostly diagonal lines and triangles, generally compare well to the published Qeya examples, particularly to the triangle band motif (Bennett 1934: Fig. 13c; Eisleb and Strelow 1980: Figs. 18–23; Bermann 1990: Figs. 73, 75). The filler spots in Figures 148 and 154 and the squares with interior circles of Figure 152 are, however, somewhat outside the range of published Qeya examples.

A limited number of shapes are represented in the Tumatumani sample. No “spittoons” (Wallace 1957: Pl. 2d; Eisleb and Strelow 1980: Figs. 12–16) or painted scallop-rimmed *incensarios* (Wallace 1957: Pl. 1b; Bennett 1934: Fig. 13b) could be identified. Most sherds appear to be from bottles, such as the body sherds with triangle band designs and perhaps the rim illustrated in Figure 153, although the diameter of this specimen seems unusually large. Most Qeya bottles do not have decoration on the exterior rim, as the Tumatumani examples do, but examples can be found in the literature (Ponce Sanginés 1981a: Pl. 2, 1981b: Pl. 3). The base from what is perhaps a cup, illustrated in Figure 154, appears to be similar to an undecorated version encountered by Bennett in his excavations (Bennett 1934: Fig. 13e), while Figure 148 may represent a slightly flared tall cup shape (Bermann 1990: Fig. 78).

The Paste 10 specimens found at Tumatumani differ in several aspects from Qeya ceramics as defined by Bennett and Wallace. In fact, in some respects the locally made examples are more similar to Qeya ceramics than are the Paste 10 sherds. The Pastes 1, 2, and 3 specimens all have the characteristic thick glossy slips, while some of the Paste 10 specimens can approach Tiwanaku slips in their thinness. Qeya vessels generally are burnished in what would be, in the categories used here, a medium or high luster category 6 or a less fine category 7 burnish. The Pastes 1, 2, and 3 sherds have this type of finish, but the Paste 10 sherds have a fine high luster category 7 finish with a very even surface contour. Most significantly, Qeya ceramics are described as having a light buff or brown micaceous paste (Wallace 1957: 19a; Girault 1990: 109; Bermann 1990: 472, 474, 488). This description applies to the Paste 1 and Paste 2 examples, which are all fired to a light brown, and even to the light brown Paste 3 example as a variant. It does not, however, describe Paste 10, which is characteristically dense, hard fired, and red-orange in color, much more similar to the Ti-

wanaku pastes than those of the Sillumocco period. It is possible, therefore, that these Paste 10 sherds were made toward the end of the Qeya period, when firing and finishing practices had begun to approach those of Tiwanaku. Alternatively, they might themselves be Tiwanaku in date, and simply decorated in an earlier, more conservative style. The Pastes 1, 2, and 3 painted sherds could theoretically also date to the Tiwanaku period, since all were found in the second construction fill or on the surface. That none of the sherds in these pastes, of which there are only five, were found in the first construction levels is considered at present to be due to factors of sampling. It does suggest the possibility, however, that the lower platform at Tumatamani was constructed at a time during the Late Sillumocco period when only Qeya-related incised ceramics, rather than painted, were found at the site. This would imply that painted sherds in the Qeya style postdate Qeya-related incised decoration, at least at Tumatamani. These hypotheses, however, cannot be tested without more stratigraphic excavation in the Juli area.

Tiwanaku Ceramics (Figs. 156–165)

Polychrome and fancy monochrome-slipped ceramics dating to the Tiwanaku period are mostly of local manufacture. Of 20 specimens, eight are of Paste 1, eight of Paste 5, and one of Paste 2. The remainder of the sample is composed of one semilocal Paste 3 fragment and two Paste 13 specimens. Since the Qeya period ceramics were determined to be principally imported, the predominantly local production of decorated wares in the Tiwanaku period is notable. Because of the small size of both the sample and the sherds themselves, it has not been possible to make a meaningful temporal subdivision within the decorated Tiwanaku sample at this time, but some specimens, such as the Paste 5 examples, can be suggested to be earlier than others.

Exclusive of the Paste 5 sherds, which are discussed separately, polychrome painted ceramics are found only in Pastes 1 and 13. The Paste 2 example is a rim from a smudged blackware *kerō*, while the Paste 3 specimen is a red-slipped rim, probably also from a *kerō*. Paste 1 specimens are slipped a monochrome red, or are decorated in black on light brown (7.5YR 5/5) or black, white, orange, and yellow on an overall red- or red-brown-slipped background (Figs. 156–159). Paste 13 examples are painted in black and red on a yellow-orange (5YR 5/8) background, or black and yellow

on a red background (Figs. 160–161). All the polychrome examples have medium or high luster category 7 or 10 burnishes, while the monochrome-slipped examples have category 6 or 7 burnishes. When burnishing direction can be detected, it is generally horizontal on Paste 1 bodies and rims, especially the *kerō* shapes, and vertical on the bases. The one Paste 3 specimen has a vertical burnish to the rim, while the Paste 2 *kerō* is burnished horizontally at the rim, and then vertically below this. Surface contours are even or very even. Polychrome ceramics generally are slipped red or light brown on the interiors, which may be finished either with a burnish or with a category 1 or 12 wipe. Monochrome-slipped wares are more likely to have an unslipped, wiped interior surface. Paste 1 vessels are fired in an oxidizing atmosphere to produce a red-brown paste color or are an incompletely oxidized light brown or red-brown with a gray core. Except for the Paste 2 smudged specimen, there are no black or gray surfaces in the sample. The Paste 3 and 13 ceramics are incompletely oxidized, with orange-brown or red-orange pastes and gray cores.

Shapes in the Tumatamani assemblage are limited; most sherds appear to come from *kerō* forms, while some rims indicate a larger open bowl shape. The pronounced curve of Figure 156, with a diameter of approximately 10 cm, is also evidence of a small, convex-walled shape, and scalloped *incensario* vessels are represented by the isolated Paste 1 scallop illustrated in Figure 159, painted with yellow stripes on a red ground. All bases are flat with vertical or nearly vertical sides.

The Paste 5 examples (Figs. 162–165) form an interesting subgroup of the Tiwanaku wares. They are all of the reduced-fiber version of this paste. Fiber voids are rare on the surface of the sherds but are visible with inspection on almost all of the examples. The vessels are painted in black, white, cream, and orange on a red background. Although in most examples the design motifs have a distinctly local appearance, the lines thicker and less carefully applied than in the Pastes 1 and 13 examples, Figure 163 is virtually indistinguishable from the non-fiber-tempered Tiwanaku wares. References to fiber-tempered decorated Tiwanaku sherds are rare, but do exist (Bermann 1990: 203). Although the Tumatamani sherds are of local manufacture, made at the end of a long-standing fiber-tempered tradition in the Juli area, their existence contributes more examples to this new feature in the range of Tiwanaku ceramic technology in the southern basin.

These Paste 5 specimens are somewhat less well finished than the other Tiwanaku polychrome sherds in the sample. All have burnished exteriors, but burnished finishes are from categories 6 and 8, with only two fine burnish category 7 examples. Burnishing reaches only a medium luster, and surface contours are less even. Interiors either are slipped red and burnished or have a category 1 or 12 scrape or wipe on an unslipped red-brown or light brown-slipped surface. Shapes present in the sample include a *kero* (Fig. 163) and a shallow slightly flared bowl (Fig. 162; the sherd is broken right at the joint with the base). All bases are flat. Fired paste color can be light brown, red-brown, red-brown with an incompletely oxidized gray core, or, with slightly higher frequency, can be cooled to produce a red-brown edge and dark core. These Paste 5 sherds are the only Tiwanaku period examples to have cooled edges, a technique more characteristic of the Sillumocco period.

Summary and Conclusions

The presentation of the ceramic artifacts from the fill excavations and surface collections at Tumatumani has been organized in this report according to the different plain and decorated ceramic wares. What remains is to present a unified chronology for the occupation of the site based on the ceramic and archaeological evidence available. The ceramics from Tumatumani are summarized in this section by chronological period, as much as current information allows, and some figures are presented to show the patterning of local and nonlocal ceramic production at the site.

Early Sillumocco

The ceramics of the Early Sillumocco period occupation at Tumatumani form a predominantly fiber-tempered assemblage. Undecorated and monochrome-slipped ceramics believed to date to this period are manufactured in Pastes 6, 7, 8, 9, and the high-fiber version of Paste 5, and thus are all fiber-tempered. Sixty-seven percent of the plainware sample is manufactured in Pastes 5 and 6 and is therefore believed to be locally produced (see paste descriptions). Pastes 7 and 9, semilocal pastes, form 31% of the sample, while nonlocal pastes account for only 1% of the sample. Early Sillumocco ceramics are characterized by a high

percentage of burnished specimens (81% of the sherds in these pastes are burnished on both sides), and a high percentage of slipped examples, totaling 39% of the assemblage. Both red and brown slips were used, with red predominating over brown by a ratio of 2:1. Unslipped ceramics are in the majority brown or dark brown and form 64% of the unslipped sample, with the remainder having a red-brown surface color. Firing that produced black or dark brown cores and cooled red-brown edges was preferred for the decorated and slipped ceramics. Shapes include globular *ollas*, jars, incurving bowls, straight-sided bowls with thickened rims, and bowls with straight, slightly flaring walls. All Early Sillumocco period vessel bases are flat.

As an assemblage, the fiber-tempered undecorated and monochrome-slipped ceramics from Tumatumani share many characteristics with Chiripa ceramics from Bolivia. This suggests that Early Sillumocco is roughly contemporary with the Chiripa period, including Chiripa Mamani and Chiripa Llusco. The question of whether any of the Pastes 1 and 3 plainwares found at Tumatumani also date to the Early Sillumocco period, or whether the fiber-tempered plainwares continue to be made during Late Sillumocco times, must at present be left open. As stated previously, there is no reason to assume that a fiber-tempered and a non-fiber-tempered tradition could not have co-existed at the site. A certain amount of overlap, principally in the decorated ceramics, can in fact be identified in both the Early and Late Sillumocco periods. At issue here, however, are the predominant characteristics of each assemblage. Although our conclusion is subject to revision as more stratigraphic evidence becomes available, we presently believe that the fiber-tempered and non-fiber-tempered plainware traditions at Tumatumani were successive, with a period of transition, presently not identifiable, existing between them. The non-fiber-tempered ceramics at Tumatumani are considerably different from the fiber-tempered wares: they have a high percentage of wiped rather than burnished specimens, show different firing technologies, and occur in different shapes or with different vessel attributes than the fiber-tempered specimens. These differences suggest that the bulk of the non-fiber-tempered ceramics at Tumatumani belong to a different chronological period in the Tumatumani sequence which, through comparison with other ceramic sequences in the Lake Titicaca Basin, can be shown to postdate Early Sillumocco. Excavation data in turn support the hypothesis that the fiber-tempered wares were not

produced in any quantity beyond the end of the Early Sillumocco period, for they were found in only very small percentages in the predominantly Late Sillumocco period first construction fill; most of the fiber-tempered specimens came from the mixed second construction episode levels or from the surface.

Decorated ceramics of the Early Sillumocco period are also in the majority fiber-tempered, but it is in this group that the few examples of non-fiber-tempered specimens occur. The vast majority (83%) of the decorated sample are manufactured in locally produced pastes, with 15% in semilocal and 2% in nonlocal pastes. Decorated sherds in the fiber-tempered Pastes 5, 6 and 9 were found that show affinities with Chiripa ceramics of the Mamani and possibly also Llusco periods, including the use of yellow/cream-on-red decoration and black and yellow on red combined with incision. Other specimens exhibit bichrome painting in various color combinations, or bichrome incised techniques. Shapes are predominantly bowls with direct or thickened rims. Qaluyu-related specimens in the Early Sillumocco assemblage occur in Pastes 1, 4, 5, and 6. They are incised and slipped red or brown, or are painted in black on a cream, light brown, red-brown, or brown background with a red-slipped interior and exterior rim. Notable in this case is that while the locally made ceramics in the Chiripa style are tempered with a large amount of fiber and have fiber voids visible on their surfaces, ceramics made at Tumatamani during the Early Sillumocco period which copy the styles of the more commonly non-fiber-tempered wares to the north were manufactured in pastes with no fiber, such as Paste 1, or with little fiber, such as Paste 6 or Paste 5 (the latter occurs in this group only in its reduced-fiber version). More semilocal and nonlocal ceramics, however, occur in the Chiripa-related decorated sample than the Qaluyu sample, with figures showing 21% from these sources in the former as opposed to only 6% in the latter.

Late Sillumocco

The Late Sillumocco period marks a change from a predominantly fiber-tempered to a predominantly non-fiber-tempered assemblage. Plainware sherds of the Late Sillumocco period have characteristically wiped surfaces on at least one and sometimes both faces. Twenty percent of all sherds believed to be Late Sillumocco in date in the first

construction fill are wiped on both sides, 78% are wiped on one side and burnished on the other, and only 2% are burnished on both sides. Dark brown slips are no longer used for the monochrome-slipped wares; red and light brown are now the prominent colors. Slipping, however, occurs in far smaller percentages than in the Early Sillumocco period; 89% of the total sample is unslipped, with only 10% slipped red and 1% slipped light brown. Firing practices move more toward oxidation and incomplete oxidation, as well as reduction, and less cooled ceramics were produced. New characteristics of vessel shape, such as flat-rimmed bowls, convex-sided bowls, incised tabs and rims, loops and scallops, horizontal handles, thickened edge bases, ring bases, and pedestal bases, appear in the assemblage. The plainware ceramics of this period are manufactured principally in Paste 1, with minor quantities of Paste 3 and 5 specimens. As such, they are more weighted toward locally produced wares, which form 89% of the sample, than the plainwares of the Early Sillumocco period. Paste 5 plainwares of the Late Sillumocco period differ from those of the Early Sillumocco period in that they are manufactured in the reduced-fiber version of this paste, containing much less fiber and with few fiber voids visible on the surface of the sherds. They are apparently the only group of fiber-tempered ceramics made in the Late Sillumocco period, for none are found among the decorated wares. In this case the Late Sillumocco Paste 5 assemblage exhibits marked similarities in vessel shape, finish, and firing to the contemporary Late Sillumocco Paste 1 ceramics, even though differences in paste composition exist.

In dating the Late Sillumocco period plainwares the issue of successive or contemporary fiber-tempered and non-fiber-tempered tradition is again raised. The possibility that some of these ceramics date in part to the Early Sillumocco period certainly exists. Many of the Paste 1 vessels can be related to Qeya period ceramics from Qeya Qollu Chico, so that the bulk of this assemblage can be placed squarely in the Late Sillumocco period. The Paste 3 wares show some similarities to Qalasa-saya ceramics and therefore are more problematic. The illustrated Qalasa-saya ceramics to which the Paste 3 examples are compared, however, appear to date to later in the Qalasa-saya sequence. Information on the characteristics of a possible earlier Qalasa-saya assemblage, dating to the Early Sillumocco period, is not available, so that comparisons cannot effectively be made. The possibility still remains that they are made in a community

that had closer ties to Qalzasaya or was producing early Qalzasaya-related ceramics during a time in the Early Sillumocco period when Chiripa-related ceramics were being produced in the Juli area.

Decorated ceramics of the Late Sillumocco period at Tumatamani are mostly incised. They are manufactured principally in Pastes 1, 2 and 3, with a small number of Paste 10 specimens. An increase in semilocal and nonlocal ceramics occurs during this period; only 60% of the decorated sample was produced locally, with 29% produced semilocally and 12% nonlocally. Designs are almost exclusively geometric, and few or no iconographic or representational figures occur. The polychrome incised ceramics that can be related to Qalzasaya and Pucara specimens are considered to date to this period. They are painted in red, light red or pink, white, cream or yellow, and black on an unslipped or light brown-slipped background and are found in Pastes 1, 2, and 3. Other Late Sillumocco incised ceramics are unslipped or monochrome-slipped and are often found with post- or pre-fire paint rubbed into their incisions. Some of these are specimens in the form of ceramic tubes or trumpets. Examples were found in Pastes 1, 2, and 3 and are decorated in a fairly homogeneous style of U-shaped incisions and punctate dots. Neither the polychrome incised ceramics nor the trumpets appear to have been produced principally in the Juli area; 60% and 72% respectively of these specimens are semilocal, from the Paste 3 production area, with the remainder manufactured locally. Other Late Sillumocco incised specimens are manufactured exclusively in the local Paste 1. These ceramics have rectangular or U-shaped incisions and a wide range of design motifs, including nested rectangles, squares, and L-shaped elements as well as parallel lines and punctate dots. Surfaces are unslipped or slipped red, red-brown, or light brown. All have a characteristic smoothed or wiped finish. The Paste 1 incised sherds were shown to be related to Qeya incised ceramics from the Tiwanaku area, Qeya Qollu Chico, and the departments of Cuzco and Puno. It is not until the end of the Late Sillumocco period that ceramics with exclusively painted decoration, specifically specimens that can be related to Qeya polychrome painted ceramics, first occur.

The Qeya painted style appears to be a nonindigenous development at Tumatamani, or one that was produced less characteristically at the site itself, insofar as 55% of these sherds were manufactured in Paste 10, which is believed to be nonlocal, and were imported from somewhere in the vicinity of Tiwanaku.

Tiwanaku

The Tiwanaku period at Tumatamani was also witness to changes in the ceramic assemblage at the site. These changes did not occur in paste composition, however, but rather in aspects of vessel firing and finish. Although ceramics similar to those of the Late Sillumocco period plainwares undoubtedly continued to be made into Tiwanaku times, new characteristics of ceramic production also appeared. Plainwares of the Tiwanaku period are found in Pastes 1 and 3. Some of these vessels were finished with a finer burnish that left no visible marks of finishing, and some were rubbed or compacted to produce a matte, smooth surface. More vessels were fired in an oxidizing atmosphere, more vessels were burnished, particularly on the interior, and more were slipped. Monochrome slips are still red and light brown, but use of the light brown color becomes more popular. Bowls and jars found in the assemblage are generally smaller in diameter and have thinner walls, and new shapes such as small *ollas* and cup forms appear.

Decorated ceramics of the Tiwanaku period return to a predominantly (85%) locally produced assemblage. Although made locally, they are fairly close copies of Tiwanaku decorative geometric styles. Specimens in Pastes 1 and 13 are painted in black, white, orange, and yellow on a red- or red-brown-slipped background, or are decorated in black on light brown. Shapes include *keros*, large and small open bowls with slightly flaring walls, and scalloped *incensarios*. It is in the decorated ceramics of the Tiwanaku period that we again see evidence of the persistence of the fiber-tempered tradition at Tumatamani. Eight Tiwanaku specimens were found in the reduced-fiber version of Paste 5, painted in black and white on a red background.

LITHIC ARTIFACTS

Matthew T. Seddon

Although lithic debris can provide valuable insights into many aspects of past technological systems, stone tools and debris have generally been given little coverage in reports on Tiwanaku period sites. This report describes the lithic materials recovered from surface collections and excavations at Tumatumani and investigates the tool assemblage and raw material use during the two major occupations of the site.

To carry out the descriptive analysis, a typology was developed to classify the tools. This typology was based primarily on formal characteristics, although some functional hypotheses are suggested for certain tool types. Clearly, though, thorough use-wear studies and experimental work need to be carried out to move analyses of Titicaca lithic materials beyond descriptions of their formal characteristics.

The lithic materials at Tumatumani can, however, provide a great deal of information regarding human behavior at the site. As was pointed out in Part I, the public architecture of Tumatumani was extensively altered during the Tiwanaku period. The lithic assemblage at Tumatumani can serve as a useful if limited starting point for an investigation of the nature and effects of Tiwanaku expansion into this area of the altiplano. It would be valuable information, for example, if we could identify changes in the organization of lithic technology before and after the reconstruction of the site by the Tiwanaku state. The investigation is limited by the nature of the context from which the lithic materials were recovered. Because the mound structures at Tumatumani are composed of mixed secondary deposits, stratigraphic relationships are not clear, and the main change in lithic technology that we might be able to observe at Tumatumani would be additions or deletions of tool categories. Drastic additions or deletions

of tool types in the pre- and post-Tiwanaku fill at Tumatumani could be indicative of changes in technology that may have been related to the arrival of the expansive Tiwanaku state. With this in mind, the other goal of this report is to compare the materials recovered from the different construction fills at Tumatumani to investigate the nature of the lithic technology before and after the restructuring of the site.

Lithic Typology of the Collection

The overall analysis focused on finished and unfinished stone tools and tool fragments as well as debitage. The typology was established for all lithic materials, other than raw material or debitage, with evidence of secondary use or modification. The raw material analysis was applied to both secondarily modified materials and to debitage.

All lithic material collected from the five excavation units and a random sample of lithic debris from the systematically collected surface units was examined. In addition, nonsystematically collected surface materials that were chosen by Stanish were considered. Comparisons will be made between materials recovered from the first construction of the site (levels 9–19, Unit 1), the upper construction (levels 1–8, Units 1–5), the sampled surface collection, and the combined Tumatumani sample.

Other than research on stone tools from the Archaic period, little systematic work on stone tools has been done for the Lake Titicaca region. Uhle (1889) reproduced figures of many types of stone tools from Ecuador, Peru, and Bolivia, including

lithic tools from Tiwanaku, but his report is extremely brief and descriptive. Bennett (1934: 425–427) mentioned the stone tools recovered from excavations at the site of Tiwanaku, and Rydén (1956: 66) also briefly discussed stone tools from the Nordenskiöld collection, but neither discussion is particularly in depth. Hyslop (1976: 442) noted the lack of work on lithic technology for the Titicaca Basin, and whereas his report does summarize tool types from a range of sites in this area, systematic definitions are needed to facilitate future intersite and diachronic comparisons. One problem, however, is that my tool definitions are based on materials from just one site. Fortunately, the tool collection at Tumatumani is similar to the collections recovered from sites that Hyslop (1976: 440–449) examined in his broad survey, indicating that the Tumatumani collection is not drastically anomalous. With these caveats in mind, the Tumatumani interpretations should be considered as preliminary or working definitions that can be modified as more research is done in this area.

As mentioned above, types were defined primarily on the basis of form, although preliminary functional interpretations based on form are posited. Tools that appeared to be different were separated visually, and then metric measurements were used to refine definitions of tool types. The major types I studied were hoes, adzes, hoe fragments, adze fragments, hoe/adze fragments (uni- and bifacial), discoids, cores, grinding stones, and projectile points (Table 7, p. 68). Other types include axes and scrapers, but these were too few in number for separate analysis and were examined as part of an “other” category (Table 8, p. 69).

The lithic typology that follows is limited by the material present at Tumatumani. Clearly, additional types need to be added to the list as lithic materials from other sites are analyzed.

Hoes and Adzes

Bennett (1934: 426) referred to these tools as axes. Rydén (1956: 66) quotes Nordenskiöld’s description of similar tools as “probably toy axes, lost by boys playing here some hundreds of years ago.” Hyslop (1976: 442–444) termed these tools “elongated andesite implements.” I have further subdivided this category into two types, hoes and adzes, on the basis of metric characteristics. Both hoes and adzes are rectangular and thin and possess a beveled bit (arbitrarily defined as the distal end); they frequently exhibit visible use-striations

that run distal to proximal along the blade of the tool (one adze did, however, exhibit lateral striations). The tools often have a smooth, glossy polish, typically near the bit, which I attribute to use. The tools also display large retouch flake removals along the lateral edges to shape the piece and also along the bit to give a beginning to the bevel. The primary difference between the two types is that hoes are generally longer, wider, and thicker than what I have termed adzes (Figs. 166, 167).

For the few recovered complete examples of each type, which were originally separated on subjective visual criteria (which tool is larger, etc.), the following measurements apply. Hoes: length, 11–25.5 cm; width, 11.5–14 cm; and thickness, 1.9–2.15 cm. Adzes: length, 7–14 cm; width, 5–8 cm; and thickness, 0.9–1.9 cm.

It is extremely likely that what I have termed hoes most probably functioned as the distal digging and prying end or *q’orana* (Rivero Luque 1987: 26) of the traditional Andean *chakitaqlla* (Quechua term) or *uysu* (Aymara term) (Rivero Luque 1987; see also Tschopik 1946: 515, Fig. 44). Forms of these traditional field preparation implements are still very much in use today in many parts of Peru and Bolivia. A survey in 1972 by the Nacional Agropecuario determined that 716,000 *chakitaqllas* were in use (Rivero Luque 1987: 8), although the distal digging bit, or *q’orana*, is now more typically manufactured from metal. Rivero Luque (1987: 82–83) reported the presence of a single *chakitaqlla* from the province of Paucartambo in the Department of Cuzco, where the *q’orana* is manufactured from stone with dimensions (28 × 12 cm) very similar to those of implements recovered from Tumatumani. The adzes may also be related to agricultural instruments or to the smaller *makitaqlla* (Rivero Luque 1987: 12–13), which was a hand-held implement used for digging of individual tubers, much like a gardener’s trowel. The polish and striations seen on both of these tools from Tumatumani could easily be explained by wear from cutting through rocky soil in field preparation and harvest. In addition, the *chakitaqlla*, when used for field preparation, is thrust into the ground and then used to pry up large sections of earth (Rivero Luque 1987: 33–44). This would put stress along the vertical (or proximal–distal) aspect of the *q’orana*, which could easily result in fractures from one lateral edge to the other, the most common type of fracture seen on the hoes and adzes at Tumatumani.

While it is extremely likely that what I have termed hoes are in fact the *q’orana* aspect of the

chakitaqlla, this is not firmly established. The forms recovered from Tumatumani do not precisely match the forms of the *q'orana*, both ancient and modern, that Rivero Luque (1987: 17, 29) noted in his study. These forms were typically stemmed at the proximal hafting end and expanded distally to the bit or *boca* (Rivero Luque 1987: 29). The complete examples recovered from Tumatumani tend to be very symmetrical (Fig. 166). In addition, whether or not the adzes represent forms of the hand-held *makitaqlla* is even more questionable, particularly since Rivero Luque (1987: 12) devoted little attention to this type and it may not be common. Because of these questions, I am reluctant at this point to formally define these tools as *q'orana* and *makitaqlla*. I prefer to continue to use the terms hoe and adze as a preliminary measure (Earle et al. [1980: 11] also referred to similarly described tools as hoes). Use of the English terms should be taken for now to convey the impression that these tools are not precisely defined and refers to their generic digging aspect.

There are few complete examples of these types of tools in the Tumatumani collection. Only three complete hoes and four complete adzes were recovered. The vast majority are fragments. Some nearly complete fragments clearly belong to one or the other category, but a large number are too small to be easily classified. The minimum information needed to determine the type of tool represented by a fragment is the presence of both finished lateral edges and both dorsal and ventral faces. In other words, the piece should not display evidence of a proximal–distal snap fracture or a dorsal–ventral break. Fragments that did not meet these criteria were defined as *hoe/adze fragments* (discussed below).

Criteria are also needed to distinguish hoe fragments from adze fragments. Length was not a sufficient attribute because the lateral axis of most fragments was broken. Separation was therefore based on thickness and width. First, fragments were subjectively classified as hoes or adzes, then length and width were measured (Fig. 168). Based on these measurements, width proved to be the more relevant dimension for separating one type from the other. The respective confidence intervals overlap between the two categories for the thickness variable, but there is no overlap for the width variable. Fragments that looked like hoes had widths greater than 8 cm, whereas adzes had widths only up to 8 cm, although fragments with maximum widths of 7–8 cm should probably be considered unclassifiable. Therefore, this benchmark

of 8 cm in width can usefully serve as a means of distinguishing hoes from adzes. Examples of hoe and adze fragments are shown in Figures 169 and 170.

Hoe/Adze Fragments

The type *hoe/adze fragments* was defined separately from hoe fragments or adze fragments, each of which is considered a unique type. Hoe/adze fragments, which are generally quite small, possess polish, striations, and/or worn surfaces that indicate they are from hoes or adzes. However, hoe/adze fragments do not have two lateral edges and often have merely one original dorsal or ventral face. These fragments include pieces broken laterally as well as pieces that were flaked from larger tools.

I further subdivided this type into two subtypes based on the type of break represented by the piece. *Unifacial hoe/adze fragments* have one worn, polished, or striated surface, but appear to have been flaked off the surface of a hoe or adze. Some of these pieces possess a bulb of percussion. *Bifacial hoe/adze fragments* have two surfaces that are worn, polished, or striated, but are missing one worked lateral edge. These pieces are probably the result of a snap break or bending fracture. All of the above types—hoes, hoe fragments, adzes, adze fragments, and uni- or bifacial hoe/adze fragments—were scored separately for each component at the site (first construction fill, second construction fill, surface collection). The majority of these tools are composed of gray andesite, with a small number manufactured from dark black basalt.

Discoids

The fourth major lithic type corresponds to Hyslop's (1976: 442) "circular stones." I renamed these types *discoids*. The majority are composed of andesite. These artifacts were formed by removing flakes from along all edges to make a roughly circular stone typically 2–3 cm thick. They also have two flat, sometimes slightly worn (although not extensively ground or polished), opposite faces or plateaus in the center of each side of the discoid (Fig. 171). They range from 2.2 to 3.2 cm in thickness with an average maximum dimension of 9.5 cm (range, 8.5–11.5 cm). The function of these stones is unclear. Hyslop (1976: 442) suggested

TABLE 7. Tumatumani lithic type collection.

Type	First (lower) construction	Second (upper) construction	Surface-collected	Total
	No. (%)	No. (%)	No. (%)	No. (%)
Hoe	0 (0)	0 (0)	3 (2.1)	3 (0.4)
Hoe fragment	6 (4.7)	9 (1.7)	10 (7.1)	25 (3.1)
Adze	0 (0)	0 (0)	4 (2.9)	4 (0.5)
Adze fragment	3 (2.4)	5 (0.9)	20 (14.3)	28 (3.5)
Unifacial hoe/adze fragment	76 (59.8)	406 (76.3)	42 (30.0)	524 (65.6)
Bifacial hoe/adze fragment	26 (20.5)	91 (17.1)	24 (17.1)	141 (17.6)
Discoids	5 (3.9)	0 (0)	6 (4.3)	11 (1.4)
Random cores	5 (3.9)	2 (0.4)	4 (2.9)	11 (1.4)
Grinding stones	2 (1.6)	6 (1.1)	8 (5.7)	16 (2.0)
Projectile points	0 (0)	4 (0.8)	9 (6.4)	13 (1.6)
Other (see Table 8)	4 (3.1)	9 (1.7)	10 (7.1)	23 (2.9)

that they were grinders or dirt clod busters. They could also be cores. It should be noted that some items I defined as hoe/adze fragments could be fragments of these tools. The type is difficult to interpret. It is particularly intriguing that discoids are present in fairly abundant quantities. Uhle (1889: Pl. 19) did not report any similar items from Tiwanaku. However, Rydén (1956: Fig. 36, Item W) reproduced what is clearly one of these discoids from the Erland Nordenskiöld collection, although he did not comment on it. This collection was recovered from the Mizque Valley in Bolivia, suggesting that the distribution of these items is extensive.

Random Cores

Random cores are the fifth major type. They are typically no larger than a fist, with flake removals on all surfaces. Some have a cortex, and some appear to have also been used as hammerstones or pulverizers, as suggested by crushing along the edges of the flake scars. Nearly all of the random cores were manufactured from basalt.

Axes

The two axes found at Tumatumani were formed from hardened sandstone and are little more than rounded rocks with a pecked, shallow groove for hafting. Uhle (1889: Pl. 19, Item 19) illustrated a similar type of ax from Tiwanaku. There was little effort to form a bit, and the axes seemed to have functioned primarily as crushing rather than as cutting devices. Because so few of these were re-

covered at Tumatumani, they were scored in the "other" category.

Grinding stones

Grinding stones are typically sandstone. They are round or oblong, ground or pecked stones with one flat, worn working surface clearly visible, and were probably used as *manos* in combination with a pestle or *metate*-like stone. I want to avoid use of the term *mano*, as most of the stones do not have a classic *mano* shape (flat and oval), and there is a great deal of variation in shape for these tools.

Chert/Obsidian types

These forms are primarily *projectile points* and *scraping tools*. The projectile points are bifacial, although several examples appear to have been made of flakes, as they possess large areas on one or both sides of the artifact that have not been scarred by flake removals. The collection of points is roughly half chert and half obsidian, with some quartzite examples. I noted three basic types: (1) triangular pieces (Fig. 172), (2) pieces with concave distal ends (Fig. 173), and (3) corner-notched or tanged types, which tend to be quite tiny (Fig. 174). Uhle (1889: Pl. 20, Items 21–30) illustrated nine tanged points, very similar to the ones from Tumatumani, which he recovered from the site of Tiwanaku itself, which suggests that the distribution of these points was extensive and may have been related to the spread of the Tiwanaku state. One concave base type was neatly denticulated along both lateral edges. *Scraping tools* exhibited

TABLE 8. "Other" category.

Lower component	Upper component	Surface
Stone bowl (1)	Basalt stone ball, bashed (1)	Axes (2)
Random core of jasper (1)	Basalt core used as hammerstone (1)	Retouched flakes, chert (4)
Andesite hammerstone (1)	Polished basalt tube (1)	Endscraper, jasper (1)
Basalt core used as hammerstone (1)	Retouched flakes, chert (3)	Sidescraper, chert (1)
	Tested piece, chert (1)	Random core, chert (1)
	Possible point preforms on flakes, chert (2)	

retouching on one or more edges (Fig. 175). One clear endscraper was found (Fig. 175). The sample size of bifacial types is not sufficiently large to merit further subdivisions.

Other

In this category were placed two kinds of artifacts: objects that clearly had been deliberately shaped but whose form defied definition, and types that were too few in number to merit analyzing as a separate type—i.e., objects that could best be analyzed as part of a group of assorted tools (Table 8).

Type Representation by Site Component

All artifacts were examined and scored separately according to the above typology for each of the site components—lower (first) construction fill, upper (second) construction fill, and surface collection. Counts and percentages of each type for each component as well as for the total Tumatamani sample are given in Table 7. Because the

abundance of hoe/adze fragments could skew the representation of formal tool types, results were also generated after exclusion of the hoe/adze fragments (Table 9).

What becomes clear is that there is a relatively even distribution of types in each sample, with hoes and adzes, as complete or fragmentary specimens, being slightly more frequent than other tool types.

It is also evident that there are few or no significant differences in representation of tool types between samples within Tumatamani. Arrangement of the types into a series and presentation of the results in a cumulative percentage graph shows minor variations between the two constructions, but little or no difference between the surface and total collections (Fig. 176). Kolmogorov-Smirnov tests failed to yield significant differences at the 0.05 level for any of the subsamples. There are very few clearly significant differences in tool type composition between any of the subsamples. The few notable differences are the complete lack of discoids in the upper component, the complete lack of projectile points in the lower component, and a drop in the number of random cores between the first and second construction episodes (from 20% of the first construction sample to 6% of the second construction sample). Although these dif-

TABLE 9. Type collection with "hoe/adze fragment" category omitted.

Type	First (lower) construction	Second (upper) construction	Surface-collected	Total
	No. (%)	No. (%)	No. (%)	No. (%)
Hoe	0 (0)	0 (0)	3 (4.1)	3 (2.2)
Hoe fragment	6 (24.0)	9 (25.8)	10 (13.5)	25 (18.7)
Adze	0 (0)	0 (0)	4 (5.4)	4 (3.0)
Adze fragment	3 (12.0)	5 (14.3)	20 (27.0)	28 (20.9)
Discoids	5 (20.0)	0 (0)	6 (8.1)	11 (8.2)
Random cores	5 (20.0)	2 (5.7)	4 (5.4)	11 (8.2)
Grinding stones	2 (8.0)	6 (17.1)	8 (10.8)	16 (11.9)
Projectile points	0 (0.0)	4 (11.4)	9 (12.1)	13 (9.7)
Other	4 (16.0)	9 (25.7)	10 (13.5)	23 (17.2)

TABLE 10. Type collection raw materials (including fragments) by component.

Component	Andesite	Basalt	Chert	Obsidian	Jasper	Quartzite	Sandstone
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Lower	117 (92.1)	6 (4.7)	0 (0)	0 (0)	1 (*)	0 (0)	3 (2.4)
Upper	510 (95.9)	6 (1.1)	7 (1.3)	2 (*)	0 (0)	1 (*)	6 (1.1)
Surface	104 (74.3)	7 (5.0)	11 (7.9)	4 (2.9)	2 (1.4)	2 (1.4)	10 (7.1)
Total	731 (91.5)	19 (2.4)	18 (2.3)	6 (*)	3 (*)	3 (*)	19 (2.4)

* Less than 1.0%.

ferences are intriguing, the small sample size precludes making substantial conclusions at this point. Further testing is necessary to determine if this pattern is repeated elsewhere in the Titicaca region.

The entire sample is dominated by implements that would have been very useful for agricultural activities, although adzes may also have been used for butchering or woodworking. Again, use-wear studies would be invaluable in determining the specific functions of these tools.

Manufacture and Distribution

Raw material frequencies of the tool types for each component were also compared (Table 10). Although projectile points are primarily composed of chert and obsidian, with three quartzite examples (Figs. 172–174), the most frequently used raw material at the site was the gray andesite common to the region. Indeed, in all the subsamples, only one hoe, two hoe fragments, and two hoe/adze fragments were manufactured from basalt, the other major raw material present at the site. Interestingly, nearly 100% of the random cores are basalt. This information diverges greatly from the results of a similar analysis reported by Hyslop (1976: 440–449). Hyslop briefly analyzed the stone tools from all sites in his survey (52 sites occupied from Tiwanaku to Colonial periods). He reported that 60% of the stone tools and debris were basalt and only 19% were andesite (the remainder were quartzite, obsidian, and jasper). The Tumatamani sample is dominated by andesite. Andesite tools range from 74% to 96% of each subsample, while basalt tools range from 1% to 5% (Table 10). A major factor that probably accounts for the pre-dominance of andesite in the Tumatamani collection is that there is a large outcropping of andesite on the nearby mountain, San Bartolomé,

making andesite more common than basalt in the immediate area around Tumatamani, while basalt outcrops are located elsewhere throughout the region (Klinck and Palacios M. 1984). Since Hyslop grouped all lithic materials that he analyzed from a wide geographic area, the difference in local raw material outcropping throughout the region may account for the difference between his sample and the Tumatamani sample. The difference in raw material use between the Tumatamani sample and Hyslop's sample may also be due to the fact that Hyslop grouped tools and debitage together in his analysis. The debitage results from Tumatamani were very different from the tool results, as will be discussed below. However, Hyslop also grouped together 52 sites occupied at different time periods. If changes in raw material use had occurred over time in this region, the temporally constricted Tumatamani materials may then be expected to vary from Hyslop's grouped results. Hyslop (1976: 442) reported that he saw few differences in raw material use between the periods he defined for his survey. Clearly, though, the Tumatamani materials differ from Hyslop's results, and this difference may be due to geographic or temporal variables.

Raw material composition of the debitage yielded very different results, and comparison of the raw material frequencies for the debitage and type collections raises a number of interesting questions. The debitage collection consists primarily of andesite, basalt, and chert flakes (Table 11). Again, subsamples differ little in their percentages of raw material. However, basalt flakes form a substantial portion of each sample (12%–20%), whereas basalt is present in much smaller proportion in the type collection (1%–5%). Furthermore, all the random cores are made from basalt. One wonders what type of artifact was manufactured from the basalt cores. Whatever this artifact was, it clearly was not deposited at the site. It is possible that the flakes themselves were produced as flake tools. It is also possible that basalt tools

TABLE 11. Debitage raw material composition by component.

Component	Andesite	Basalt	Chert	Obsidian	Jasper	Quartzite
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Lower	646 (78.5)	159 (19.3)	16 (1.9)	0 (0)	1 (*)	0 (0)
Upper	6,506 (83.8)	958 (12.3)	239 (3.0)	14 (0.2)	25 (*)	17 (*)
Surface	255 (72.6)	61 (17.4)	30 (8.5)	0 (0)	5 (1.4)	0 (0)
Total	7,407 (82.9)	1,178 (13.2)	285 (3.1)	14 (*)	31 (*)	17 (*)

* Less than 1.0%.

manufactured at Tumatumani were used elsewhere or were moved out of the area via trade or some other mechanism. Use-wear studies of the flakes and regional analyses of stone tools need to be carried out to address these questions.

Furthermore, while obsidian projectile points compose 3% of the type collection, the percentage of obsidiandebitage does not exceed 1% in any of the subsamples. In fact, only 33 obsidian flakes in total were recovered, indicating that manufacture of the obsidian artifacts probably occurred elsewhere.

The different percentages of raw material types between the tool collection and thedebitage collection suggest that a complex system of lithic manufacture and use occurred within the Juli region. The results from Tumatumani indicate differential spatial distribution of raw material procurement, manufacture, use, and distribution. On the one hand, it appears that basalt artifacts manufactured at the site may have been transported elsewhere, either for trade or for use, while the obsidian artifacts were manufactured elsewhere and then traded or transported for use at Tumatumani. In addition, there is an intriguing suggestion from the decrease in the number of random cores between the first and second construction fills that the manufacturing system may have changed over time in the area. However, the fact that all the samples are small and from mixed construction fills dictates that this must remain merely a suggestion until further testing can clarify the pattern. At any rate, a different set of manufacturing and final deposition locales is indicated by the Tumatumani materials. Analysis designed to locate and clarify this pattern at other sites in this period in the Titicaca Basin could yield further information about trade, lithic procurement, elite use of goods, and other aspects of the pre-Tiwanaku lithic technological systems in this area.

Conclusions

The results of a systematic definition and analysis of the Tumatumani lithic debris in terms of assemblage composition and raw material use suggest a number of interesting patterns. As expected, since the two constructions at the site were composed of mixed fill, results from the analysis show little clear change in lithic technology after the Tiwanaku restructuring of the site, although there are some interesting suggestions from the data that merit further exploration. However, raw material use, particularly of basalt and obsidian, differs substantially between thedebitage collection and type collection and could well indicate a system of differential use, manufacture, and final deposition of stone tools. Also, the degree to which the raw material frequencies from Tumatumani, essentially a Sillumocco and Tiwanaku period site, differ from Hyslop's multi-period results indicates possible temporal changes in raw material usage. Further work, particularly in the analysis of raw material use at different sites within this period and between temporal periods, is clearly needed.

Preliminary results from a systematic survey of this area (Stanish et al. 1992) suggest further avenues for work along these lines. Limited and subjective viewing of the artifacts uncovered at a number of other Tiwanaku period sites in the area suggests that these sites have lithic collections (hoes, discoids, adzes, flakes, etc.) similar to the Tumatumani collection. These different sites appear to have been part of a broad system of lithic manufacture, use, and distribution throughout the Sillumocco and Tiwanaku periods in this region. The remaining question regards the nature of this system and how it compares with earlier patterns of tool manufacture and use in the area. Further analysis of lithic debris from these sites could clarify this pattern.

Part 3 Summary and Conclusions

Charles Stanish

The results of our recently completed survey provide the regional context for the Tumatumani data. The results of collecting and intensive mapping at Tumatumani provide a good characterization of surface data from the entire site. Finally, the excavations provide reliable data on the lower terrace found on the eastern side of the west mound. We think that the conclusions about the architectural constructions drawn from the excavation data can be interpolated to the entire west mound as a whole. With this in mind, the following summary of Tumatumani is offered.

Tumatumani is a major site with artificial mounds located in prime agricultural land next to Lake Titicaca. In our typology of sites developed from the survey data, Tumatumani can be labeled a Type 1, Large Artificial Mound (Stanish et al. 1992). Type 1 sites are elite/ceremonial settlements, and there are at least three Type 1 sites, including Tumatumani, in the Juli–Pomata survey area. The other elite/ceremonial site type, Type 3, is characterized by low, nondefensible, terraced hills with corporate architecture on the top. There are at least three Type 3 sites that date to the Sillumocco and/or Tiwanaku periods in the Juli–Pomata region as well.

Tumatumani is therefore one of at least six elite/ceremonial sites in the Juli–Pomata region that date to the Late Sillumocco and/or Tiwanaku periods. It represents one of two principal elite/ceremonial settlement types (Types 1 and 3) for the Late Formative and Tiwanaku periods in the Lake Titicaca region.

Tumatumani is 5.3 ha in size and is composed of two principal mounds. The formal architecture of the west mound is characterized by a low platform with a second, smaller platform built on top

of the first. The east mound, in contrast, is shaped like an elongated U or horseshoe, 150 m at its maximum length. This U shape is a classic Initial period and Early Horizon construction technique in the central Andes as a whole, but it is rare in the Titicaca region. It is the only U-shaped structure in the Juli–Pomata survey, with the possible exception of one small mound in the El Molino area.

The major occupations at the site of Tumatumani include an Early Sillumocco one, a Late Sillumocco one, and a reconstruction of the site by the Tiwanaku state. Minor occupations at the site include Inca, Early Colonial, Republican, and Modern ones. The existence of Early Sillumocco pottery with similarities to Qaluyu (ca. 800 B.C.) in construction fill indicates an earlier occupation prior to the construction of the formal terraces. The nature of the earliest occupation has not been precisely defined: the fill from the first terrace occupation seen in the excavation profiles was collected on the site and reused for the construction of the first, formal terrace base. This fill was then faced with a large wall.

Contemporary with the construction of this wall was the placement of several burials (two of which were excavated this season) at the base of the wall into the natural subsoil. The latest ceramic fragments in this fill (Late Sillumocco) give a terminal date for this construction. The first major terrace at the site was therefore constructed in Late Sillumocco times, ca. 200 B.C.–A.D. 400. The earlier Early Sillumocco village that existed on the low natural hills at the site area was disturbed to obtain the fill to build the formal terrace during Late Sillumocco times. The precise nature of this earlier village site remains to be defined.

The second major construction activity at the site was characterized by a rebuilding of the earlier terraces into larger ones with the same basic architectural pattern. This second occupation would correspond to the platforms now seen on the surface of the mounds. Although no wall stones are now evident, the quantity of stones in the vicinity of the site strongly suggests that these were used to face the platforms in a manner similar to the earlier one. A construction date for this rebuilding episode would be Tiwanaku IV (A.D. 400–750). This date was corroborated by two profile cuts into disturbed surface platform walls that also contained Formative and Tiwanaku materials.

The final occupation discovered in these investigations was a small Inca period house built over the Tiwanaku period terrace. The stones used in the construction of the Inca house were probably those originally used in the construction of the earlier terrace. Reuse of stones and the post-Inca agricultural activities would help explain the lack of any terrace wall stones associated with the second formal construction on the site.

The initial Early Sillumocco occupants apparently chose two naturally high areas near the lake for their settlement. The agriculturally rich alluvial zone was left for cultivation, and this pattern continued throughout the occupation at the site. In fact, Tumatumani is considerably less complex than expected, with all residential occupation and nonresidential architecture located on the mound areas proper. There is no evidence of nonelite residence away from the mound proper with related high-status habitation or elite/ceremonial areas near the core. Likewise, the surface survey did not detect any appreciable differences within the residential area itself. Rather, the terraces constructed on the mound are interpreted as principally residential in function, and terraces that were used by the entire population.

One of the most important results of this research is the ceramic analysis of Steadman, reported in Part 2. This analysis constitutes one of the primary justifications for proposing the Sillumocco culture. I will now summarize some of the important conclusions of her analysis as they relate to the nature of the Sillumocco ceramic assemblage, culture, and time period.

The Tumatumani ceramic assemblage is a local one, but it displays many similarities to the southern Titicaca Basin traditions (Chiripa, Qeya, and Qalasitasaya). These differences are sufficiently marked to warrant its separate cultural designation. The Pre-Tiwanaku IV ceramic assemblage

also is characterized by a less intensive but nonetheless significant borrowing from the northern Titicaca Basin tradition, the ancestral home of the Qaluyu and Pucara styles.

A substantial number of the diagnostic plainwares and decorated pieces in the pre-Tiwanaku IV periods were locally produced. The only significant exception is a group of Qeya imports made in nonlocal pastes. The earliest decorated pieces are local imitations of Qaluyu. Other Early Sillumocco incised and painted pieces are very similar to Chiripa, but *most* were made in local or semilocal pastes. The narrow incisions and unusual color combinations on some of these pieces appear to be purely local innovations in a “Juli” style (pp. 53–54).

In the Late Sillumocco period, the most common undecorated paste type, Paste 1, is used in vessels that are technologically and morphologically similar to Qeya (pp. 40–41), yet most of the rim shapes of these vessels in the Tumatumani materials are not found in Qeya assemblages (p. 40). The characteristic and highly diagnostic Pucara thickened rims also are not found in the Tumatumani assemblage (p. 40).

In other ceramic characteristics we see borrowing from both the north and the south, as well as independent stylistic innovation at the site. Incurving bowl forms are found in Pucara but not in the south (p. 40). The Tumatumani ring-based, scalloped-edge *incensario* shape is very similar to Qeya specimens, while the incised sherds associated with this shape are similar to examples from both the northern and southern Titicaca Basin (pp. 58–59). Pedestal bases are found in both Pucara and Qeya assemblages (p. 40). The Late Sillumocco polychrome incised ceramics borrow from Pucara and Qalasitasaya but are distinctive enough to represent a new, local type produced in Juli (p. 55).

The contrast with Tiwanaku ceramics is quite marked. The Tiwanaku IV period ceramic materials represent a significant change in the source of stylistic borrowing: all influence was from the Tiwanaku state, and there is far less evidence of local stylistic innovation in the decorated ceramic vessels vis-à-vis contemporary styles from the Tiwanaku area itself. By Tiwanaku IV times, both the ceramic and settlement data strongly suggest the incorporation of the Sillumocco populations into a larger political entity controlled by Tiwanaku.

These data suggest that Tumatumani represents a major site that was part of an autonomous po-

litical entity that had borrowed styles from both the southern and northern Titicaca Basin during the pre-Tiwanaku IV periods. By the Tiwanaku IV period, Tumatumani had been incorporated into the Tiwanaku state.

The research at Tumatumani, combined with our survey data, will force us to revise our understanding of the Upper Formative period in the southwestern Titicaca region. The existence of a new Upper Formative period culture—Sillumocco—along with Pucara to the north and early Tiwanaku and/or Chiripa (Tiwanaku I–III and Chiripa Mamani) to the south, points to a much more complex political and economic landscape in the region prior to the emergence of the Tiwanaku state as a regional power.

A traditional conception of the Upper Formative period Titicaca Basin is that it was divided into two great spheres of cultural innovation and political control as represented by Late Pucara and Early Tiwanaku (Tiwanaku III or Qeya). This assumption, implicit or explicit, will have to change. Sillumocco represents an as yet poorly understood

political and economic entity of substantial complexity. Almost certainly, economic and political relationships between the Sillumocco sites and their northern and southern neighbors were constantly in flux, as would be expected in such a political landscape.

In a similar vein, the Tumatumani data, as well as the survey data, indicate that the absorption of the Juli–Pomata area by the Tiwanaku state was not accompanied by major disruptions in settlement patterns. The Late Sillumocco elite/ceremonial centers continued to exist as part of the Tiwanaku system. This suggests that the absorption was gradual, perhaps involving a long history of fluctuating elite alliances that ultimately crystallized into more direct, formal control by the Tiwanaku state.

Research on the Sillumocco and Tiwanaku periods in the Juli–Pomata area is ongoing. Future research will clarify many of the political and economic relationships between the southwestern Titicaca region and its neighbors to the north and south.

















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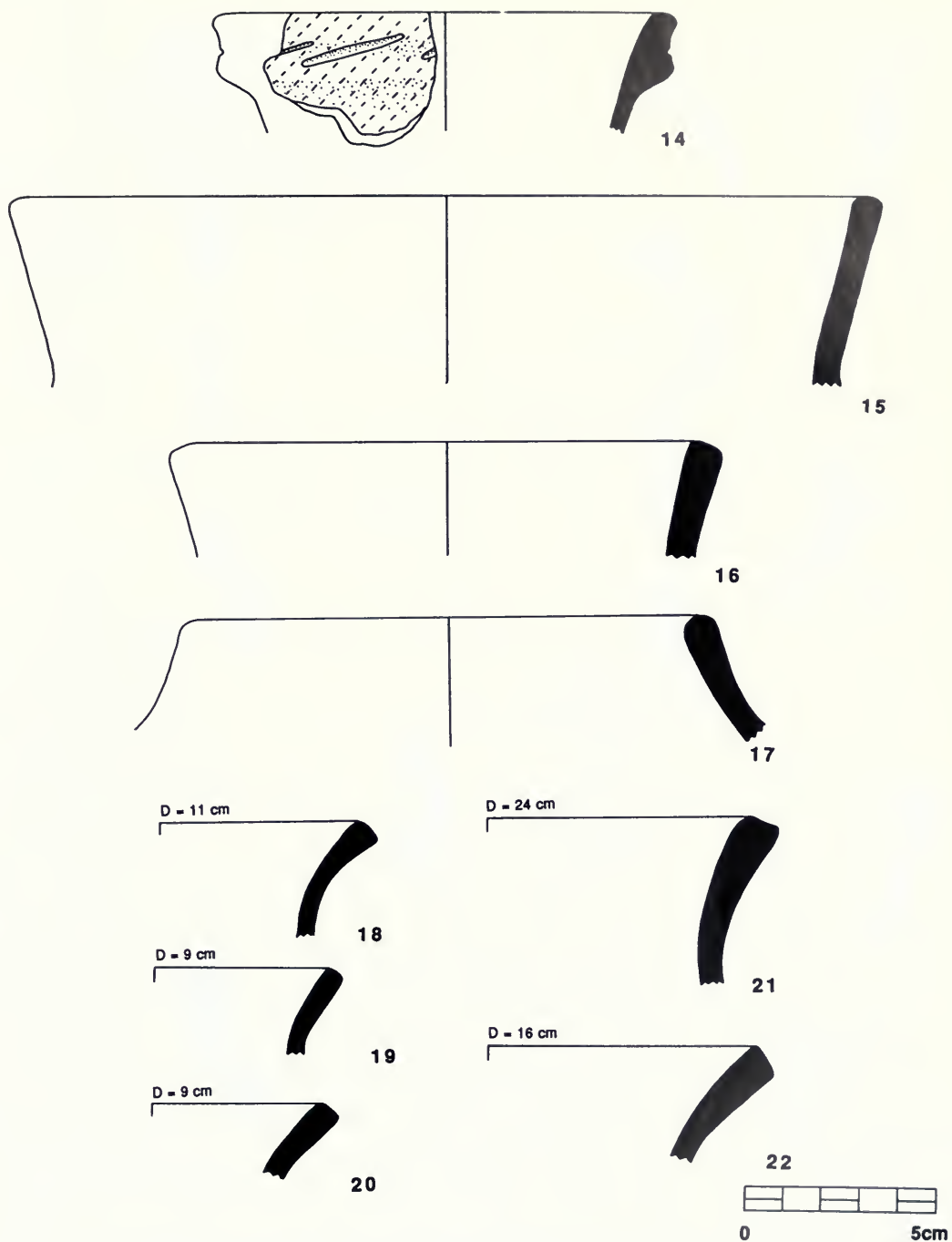
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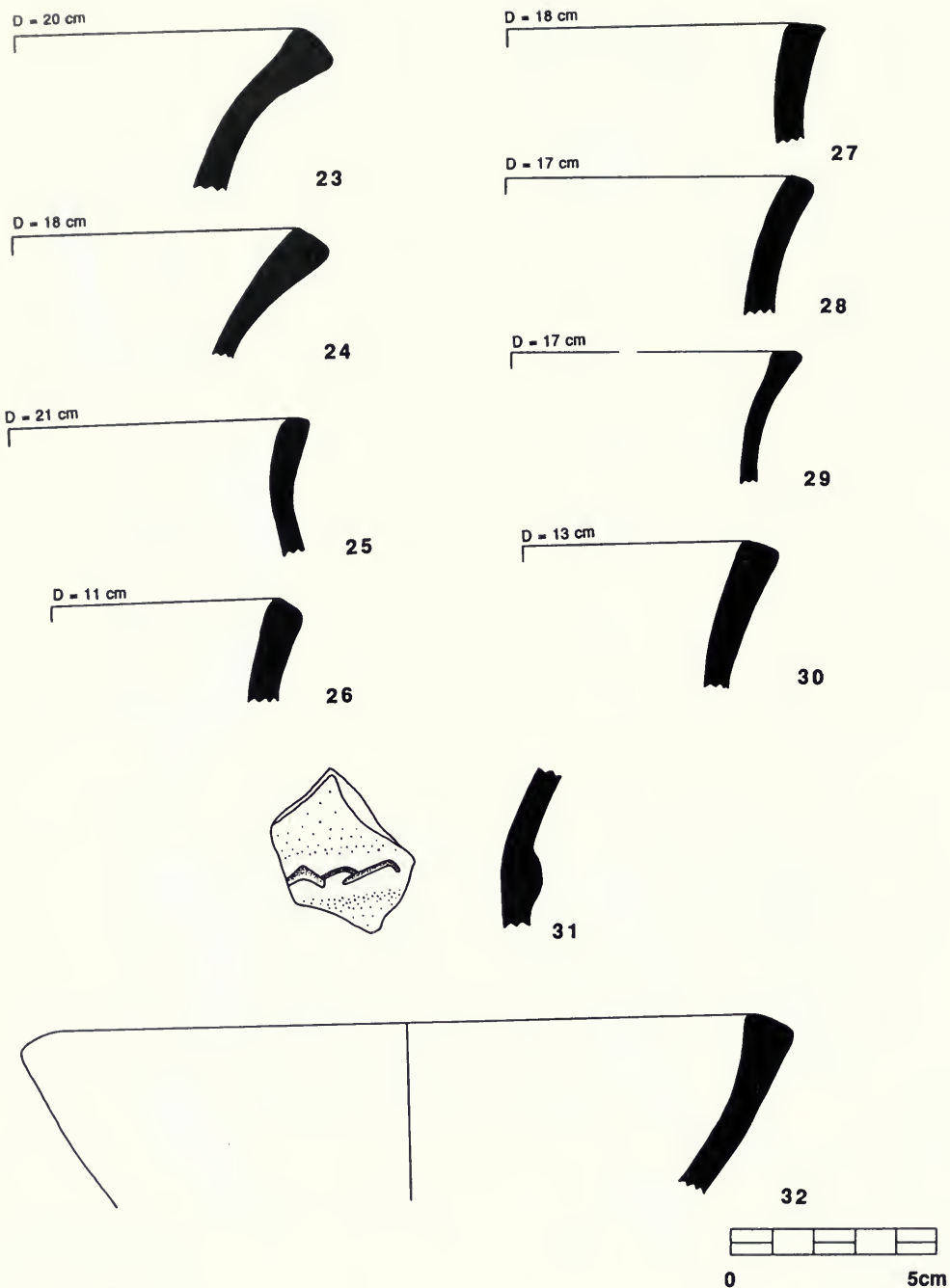
Key to Ceramics, Figures 14-165

	Red		Black
	Dark red		White
	Light red		Cream
	Pink		Yellow
	Red-brown		Yellow-orange
	Brown		Orange
	Dark brown		Post-fire red
	Light brown		Post-fire yellow

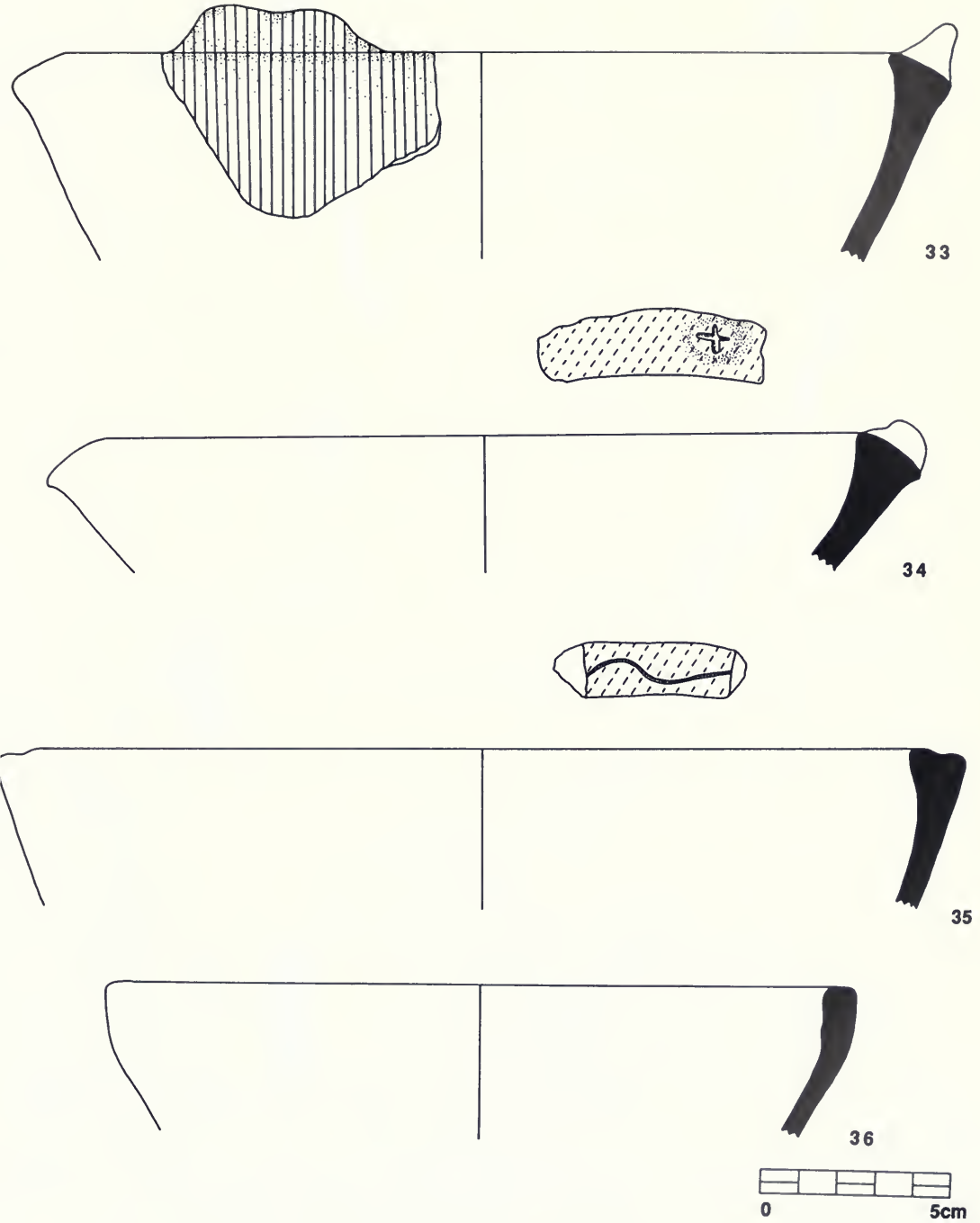
Munsell soil colors corresponding to key: Red: 7.5R 3/6-8, 3.5/6; 10R 3-4/6, 3.5/6. Dark red: 10R 3/2-4. Light red: 7.5R 4/6, 3.5/8; 10R 4.5/6-8. Pink: 5R 5/6. Red-brown: 2.5YR 3/4-6, 3.5/6, 4/4-8. Brown: 5YR 4/3-5, 4.5/4; 7.5YR 4/4; 10YR 4/4. Dark brown: 2.5YR 3/2; 10YR 3/2. Light brown: 5YR 5/5-6, 6/4-5; 7.5YR 5/4-6, 5.5/4-6, 6/4-5; 10YR 5/3, 5.5/4, 6/4. Black: 10R 2.5/1; 2.5YR 2.5/0; 5YR 2.5/1-2; 7.5YR 2-2.5/0; 10YR 3/1. White: 5YR 8/1; 7.5YR 8/2-3; 10YR 8/2-3. Cream: 7.5YR 7.5/4-6, 8/4; 10YR 8/4. Yellow: 7.5YR 6/7-8, 7/6-7, 8/5-6; 10YR 7/6. Yellow-orange: 5YR 5/8, 6-7/6. Orange: 2.5YR 5/8. Post-fire red: 7.5R 3/6-7; 10R 4/8. Post-fire yellow: 5YR 6/8; 7.5YR 7/7-8.



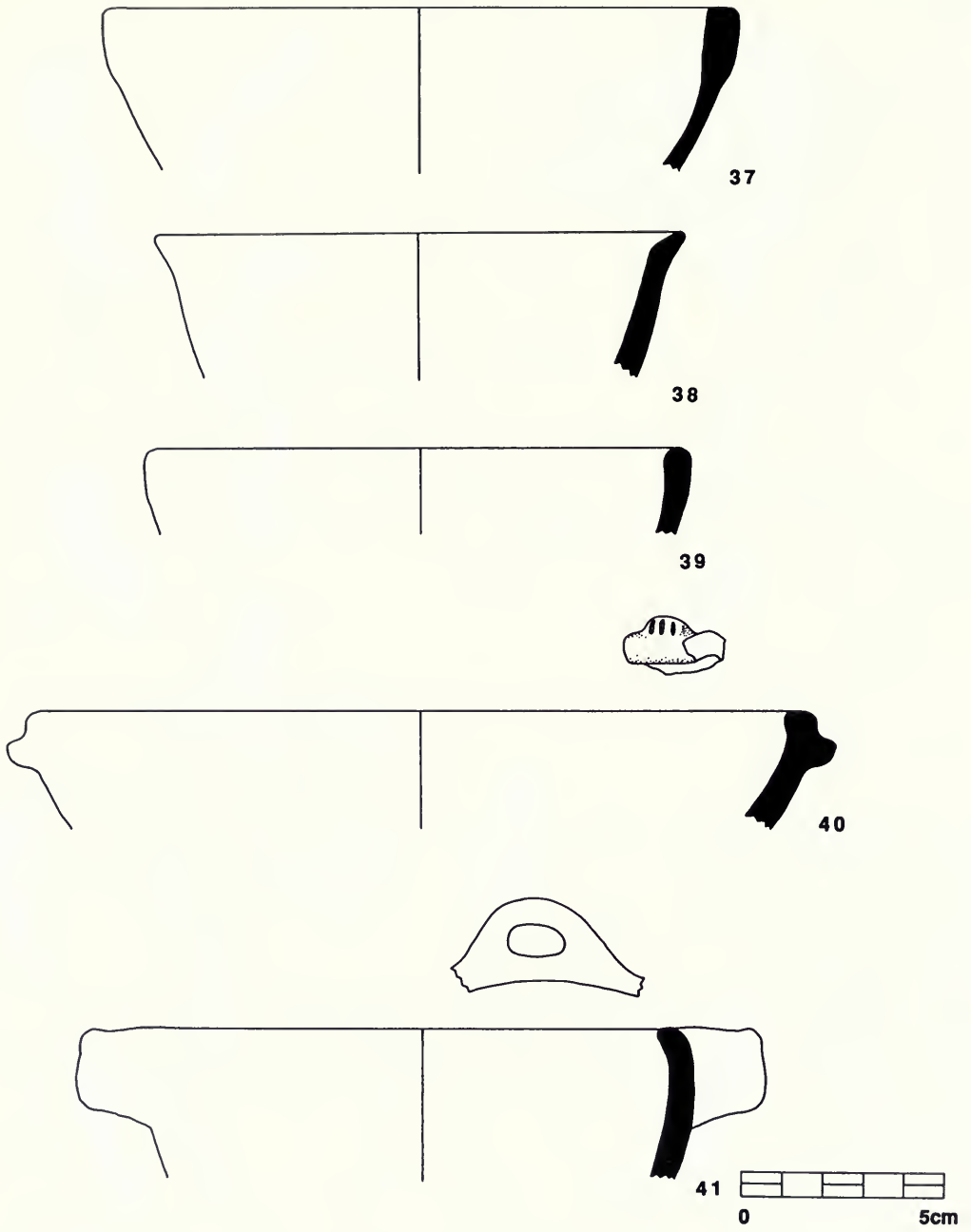
Figs. 14–22. 14, Paste 4 jar; 15, 16, Paste 7 jars; 17, Paste 7 olla; 18–22, Paste 1 jars.



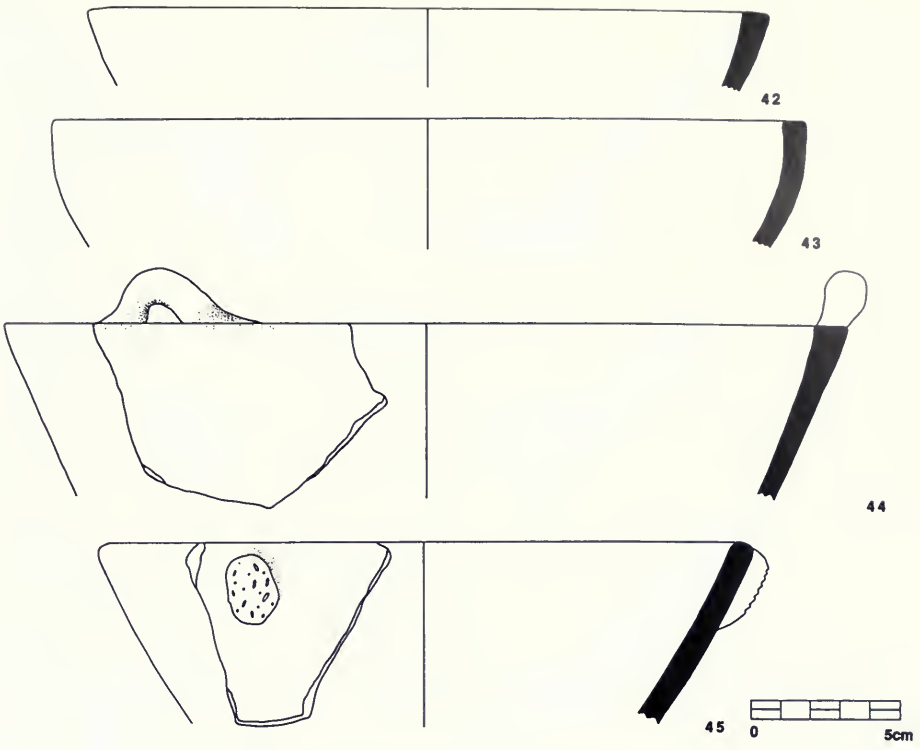
FIGS. 23–32. Paste 1. 23–30, jars; 31, incised fillet at neck joint; 32, bowl shape A.



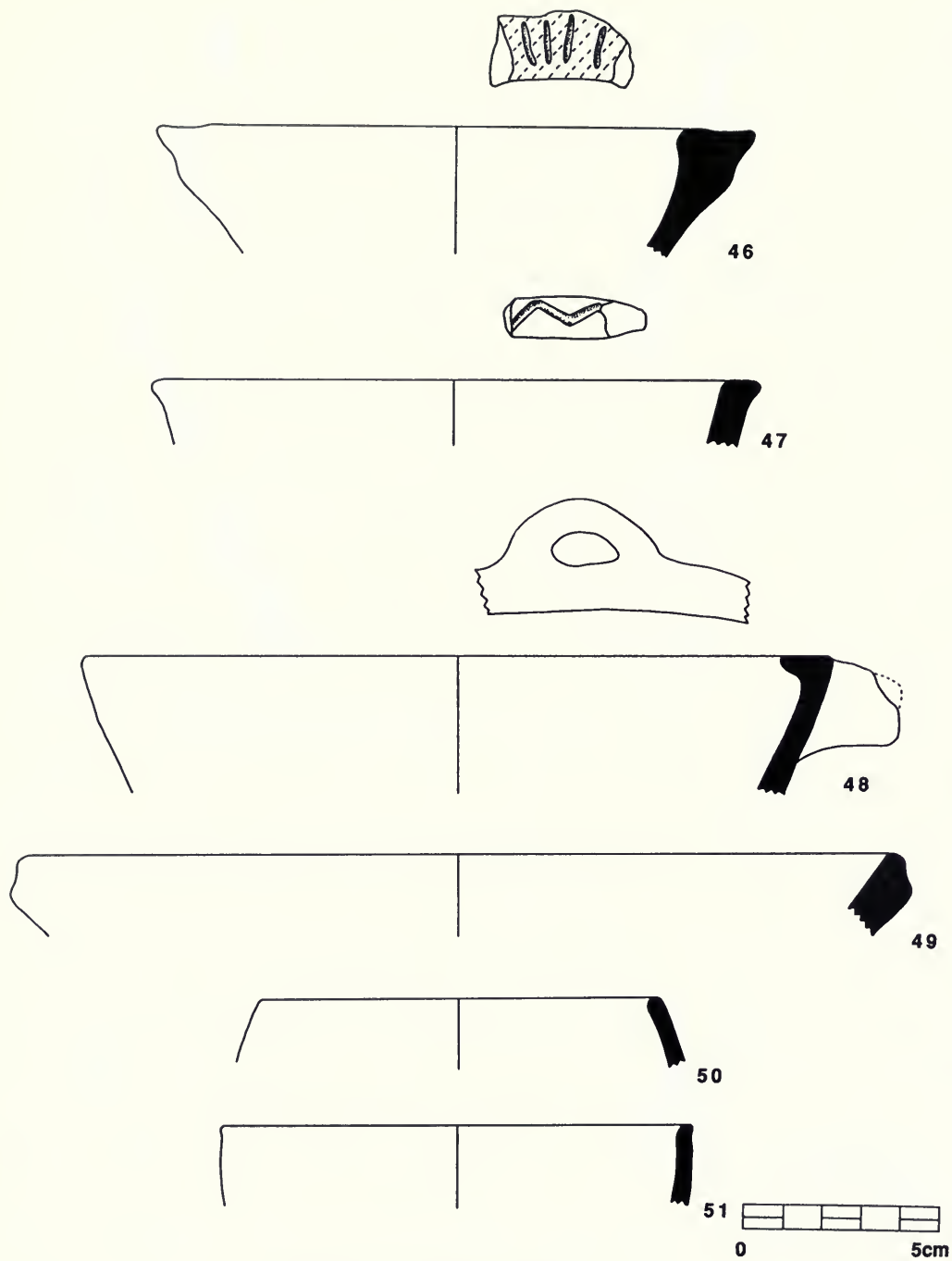
Figs. 33-36. Paste 1. 33-35, bowl shape A; 36, bowl shape B.



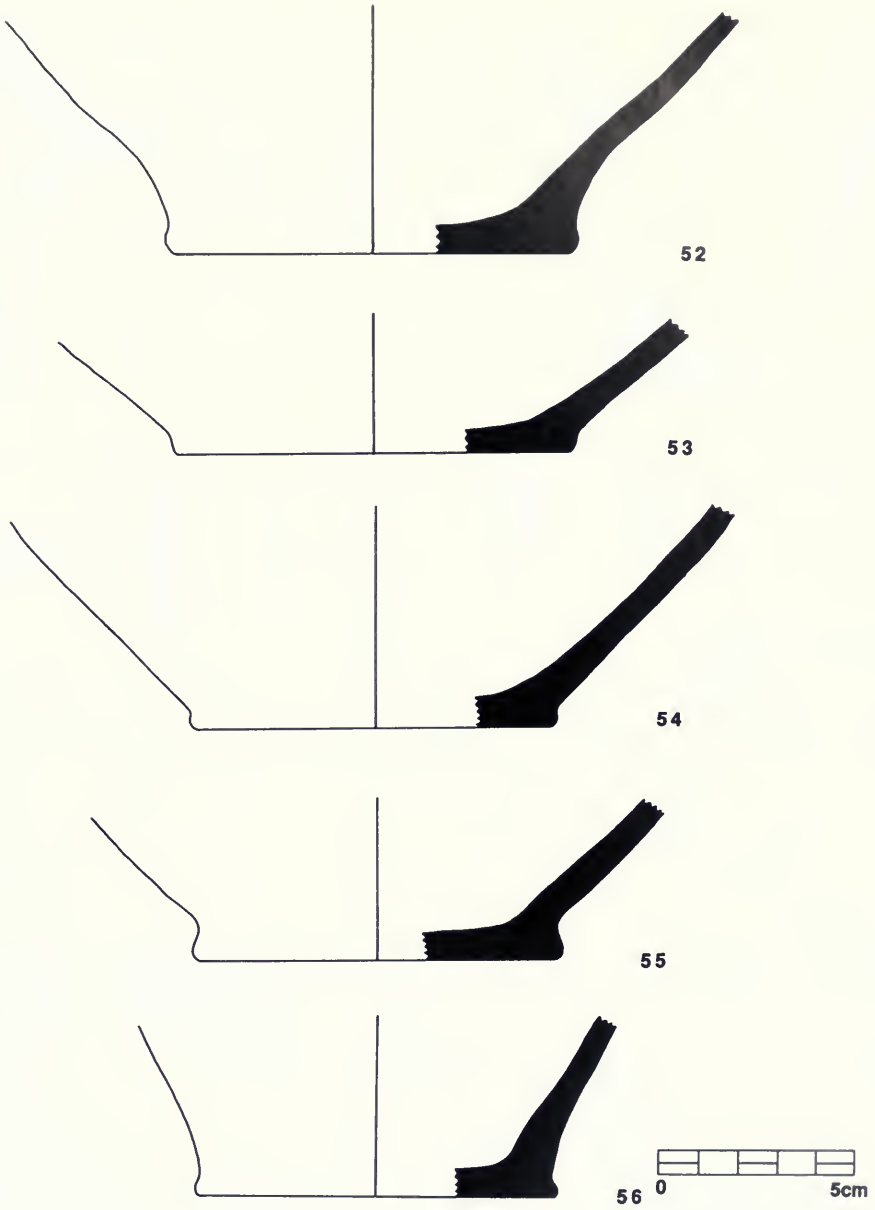
FIGS. 37-41. Paste 1. 37, bowl shape B; 38, bowl shape C; 39-41, bowl shape D.



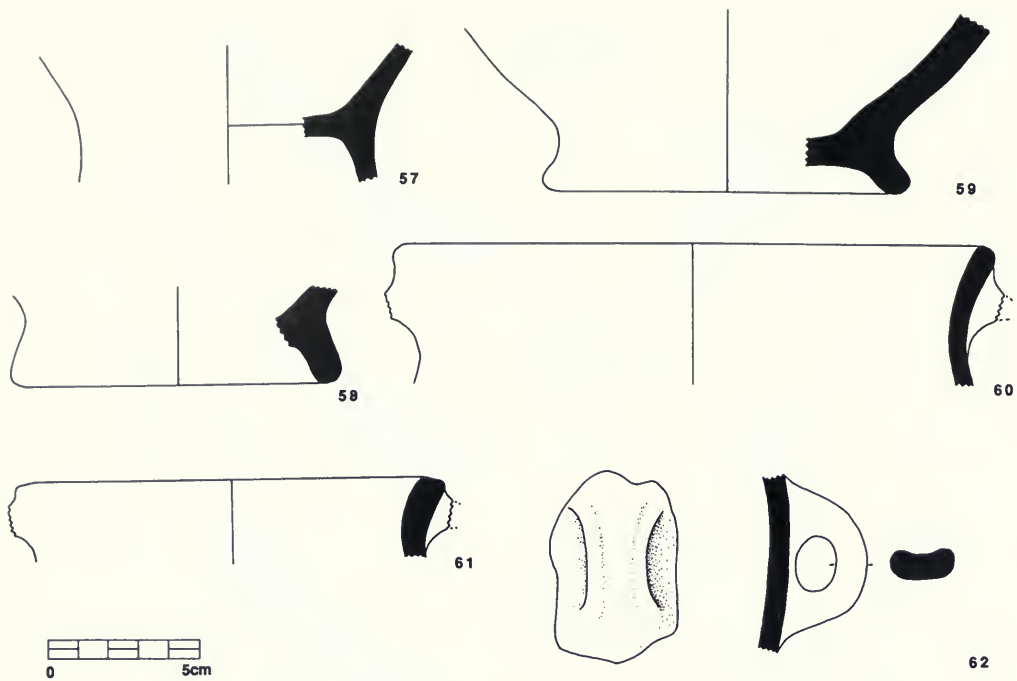
FIGS. 42-45. Paste 1. 42, 43, bowl shape E. 44, 45, straight-sided bowls.



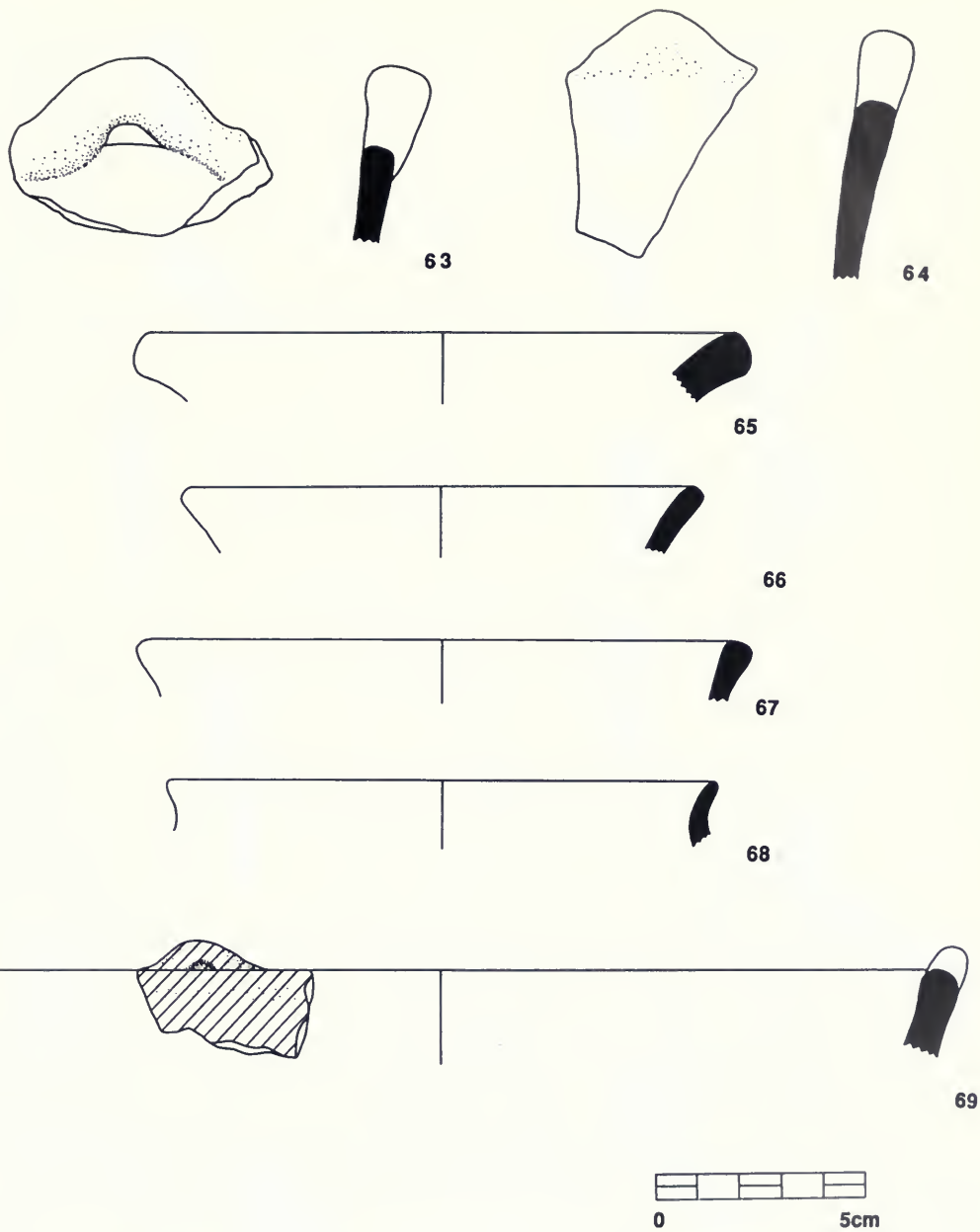
Figs. 46–51. Paste 1, miscellaneous rims.



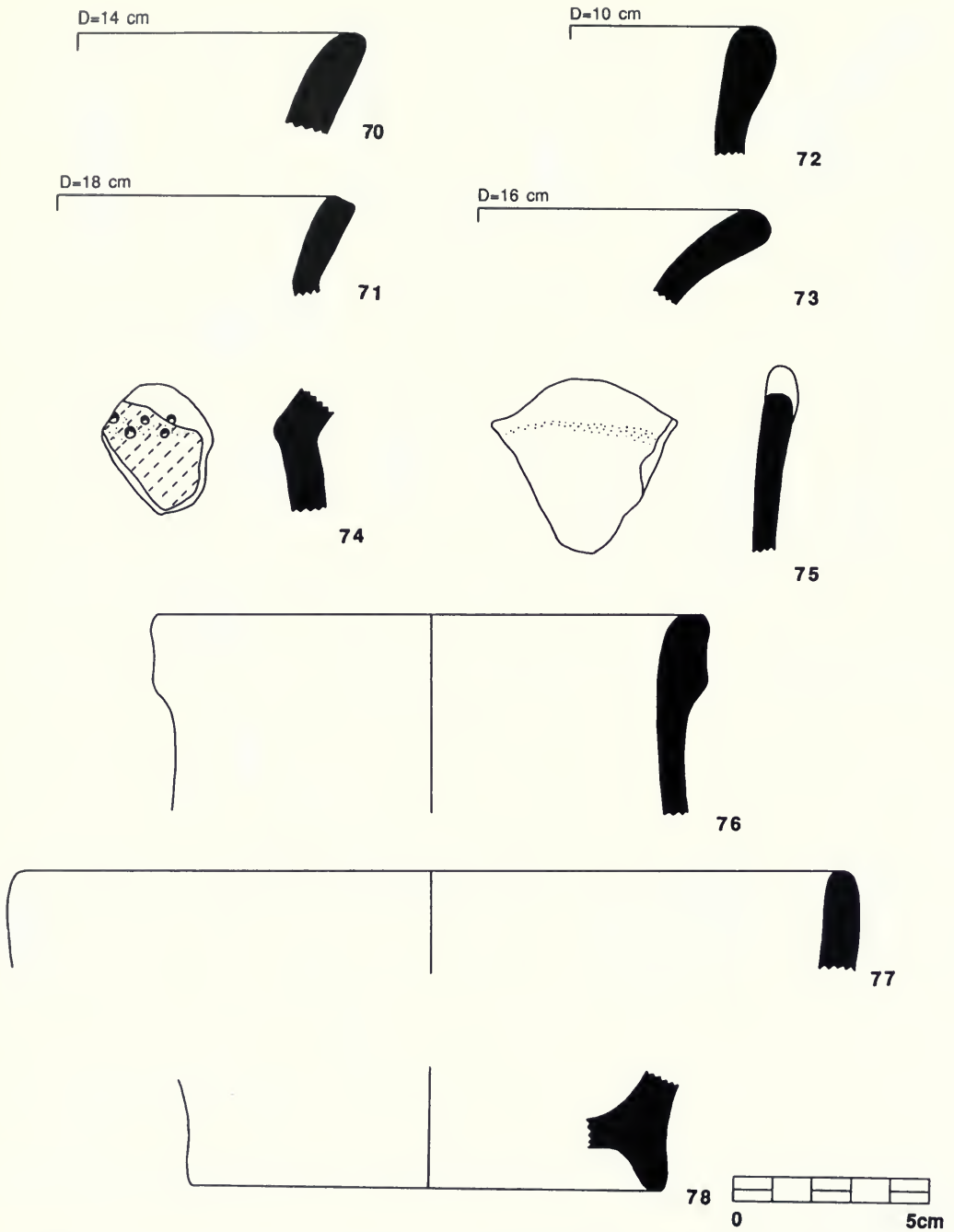
Figs. 52-56. Paste 1, thickened edge bases.



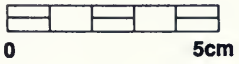
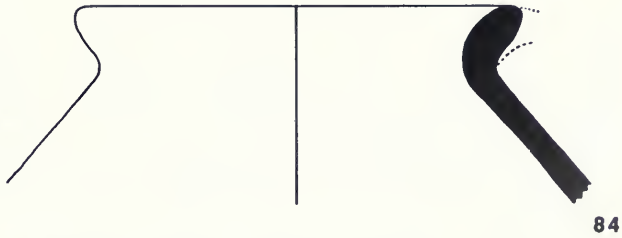
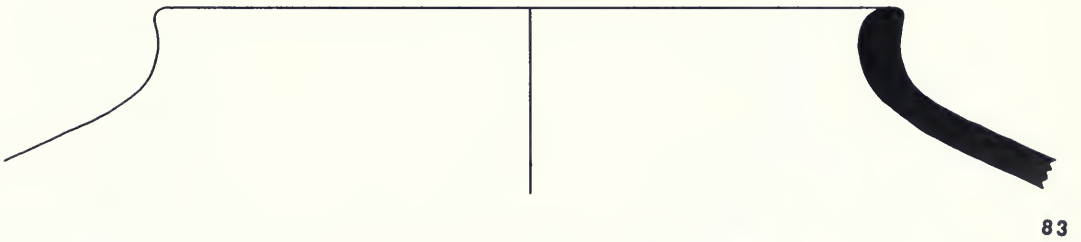
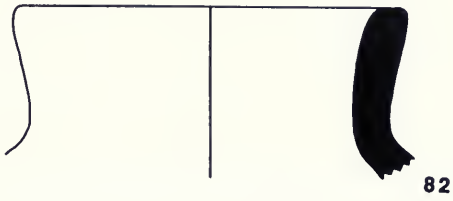
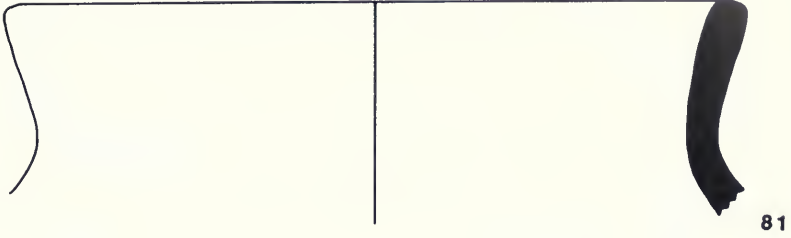
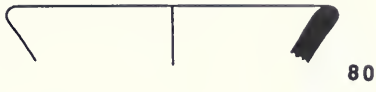
FIGS. 57–62. Paste 1. 57, pedestal base; 58, 59, ring bases; 60, 61, rim-to-body strap handles; 62, strap handle.



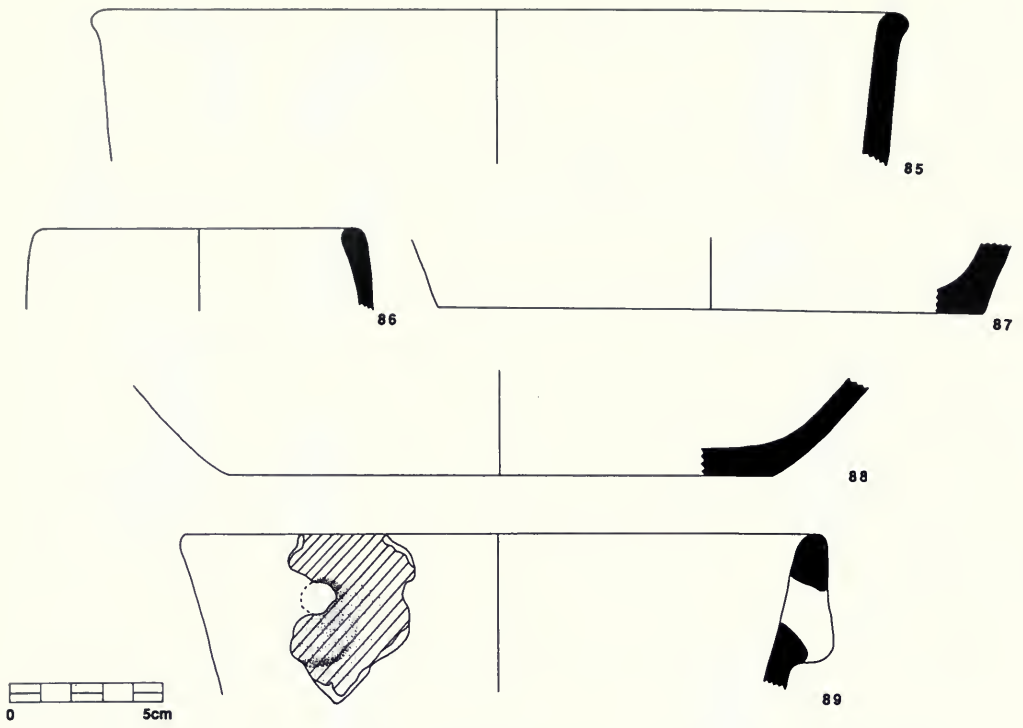
FIGS. 63–69. Paste 1. 63, rim loop; 64, scallop; 65, 66, Tiwanaku period jars; 67, 68, Tiwanaku period small *ollas*; 69, Tiwanaku period bowl.



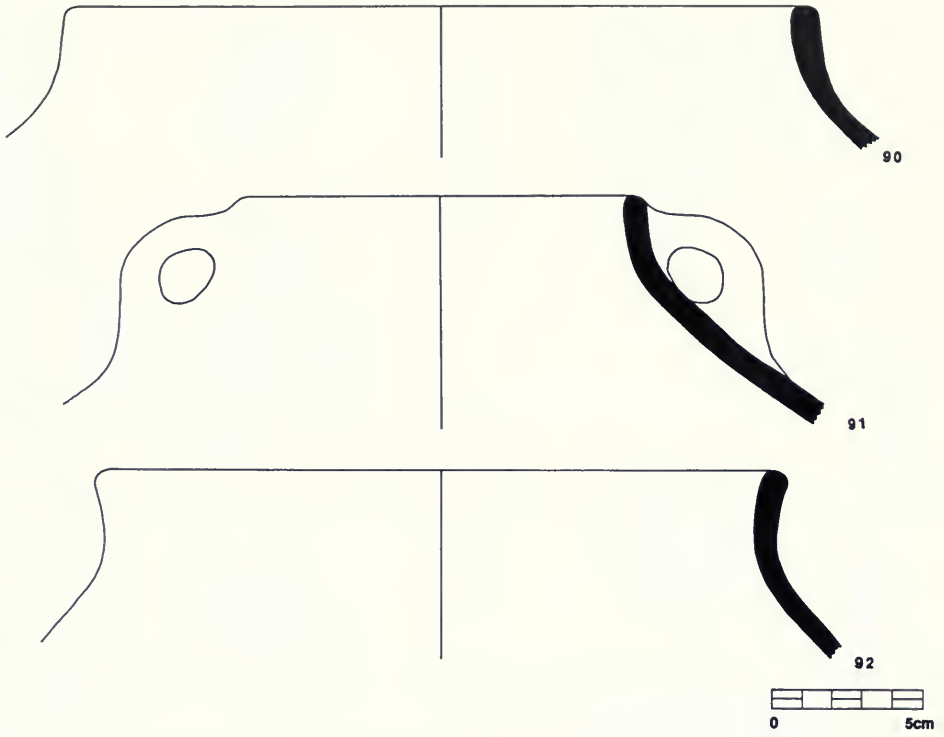
FIGS. 70-78. Paste 3. 70-73, jars; 74, punctate incision at neck joint; 75, scallop; 76, tall-necked jar; 77, bowl; 78, ring base.



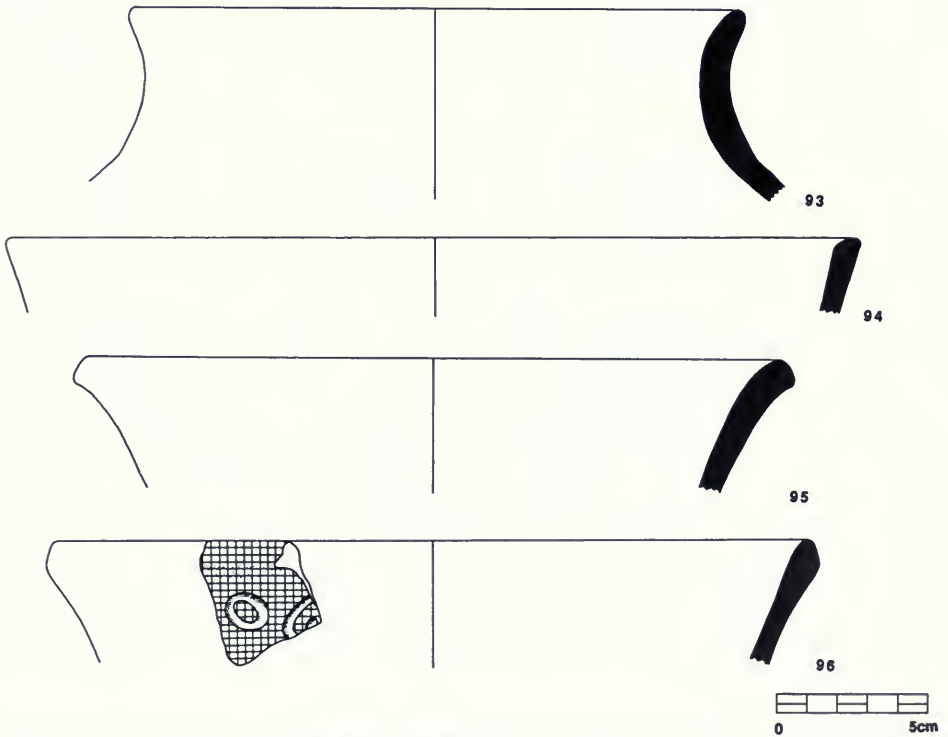
Figs. 79–84. 79, 80, Paste 3 Tiwanaku period shapes; 81, 82, Paste 5 jars; 83, 84, Paste 5 ollas.



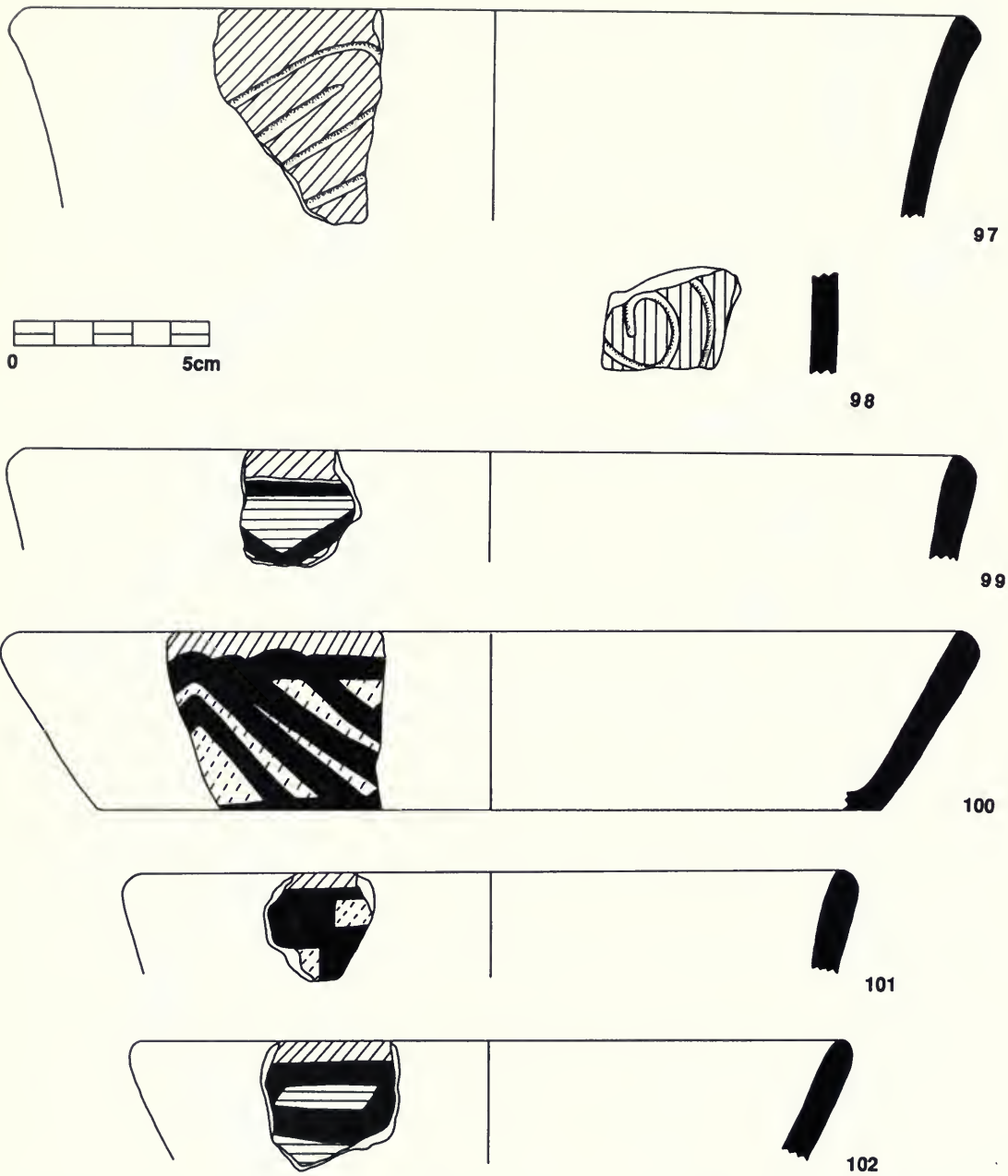
FIGS. 85-89. Paste 5. 85, straight-sided bowl; 86, incurving bowl; 87, 88, bases; 89, spout.



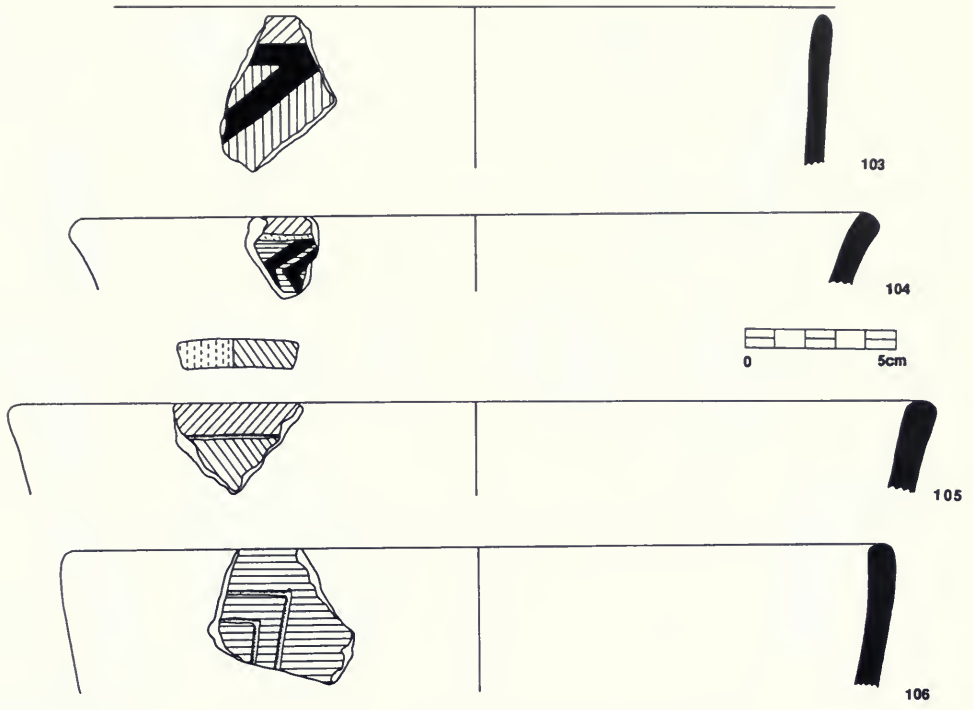
Figs. 90–92. Paste 9. 90, 91, *ollas*; 92, jar.



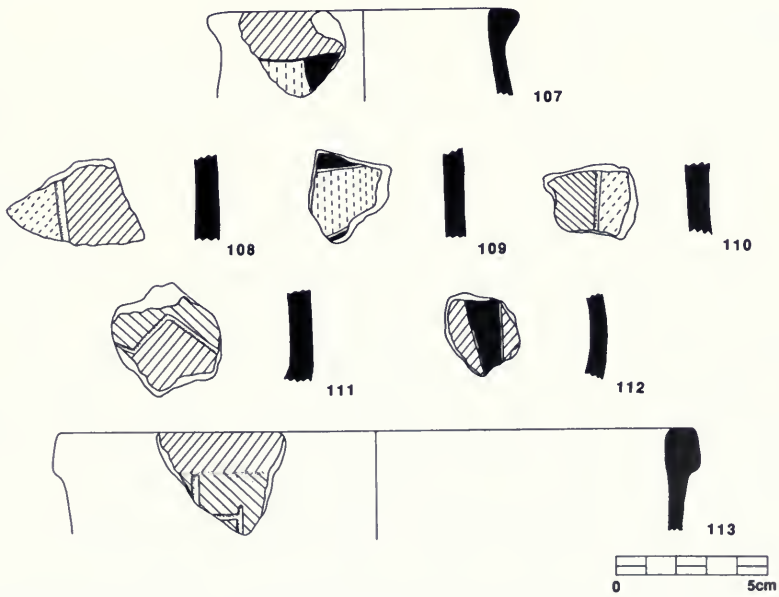
Figs. 93–96. Paste 9. 93, jar; 94, 95, bowls. 96, Paste 1 Early Sillumocco–Qaluyu incised bowl.



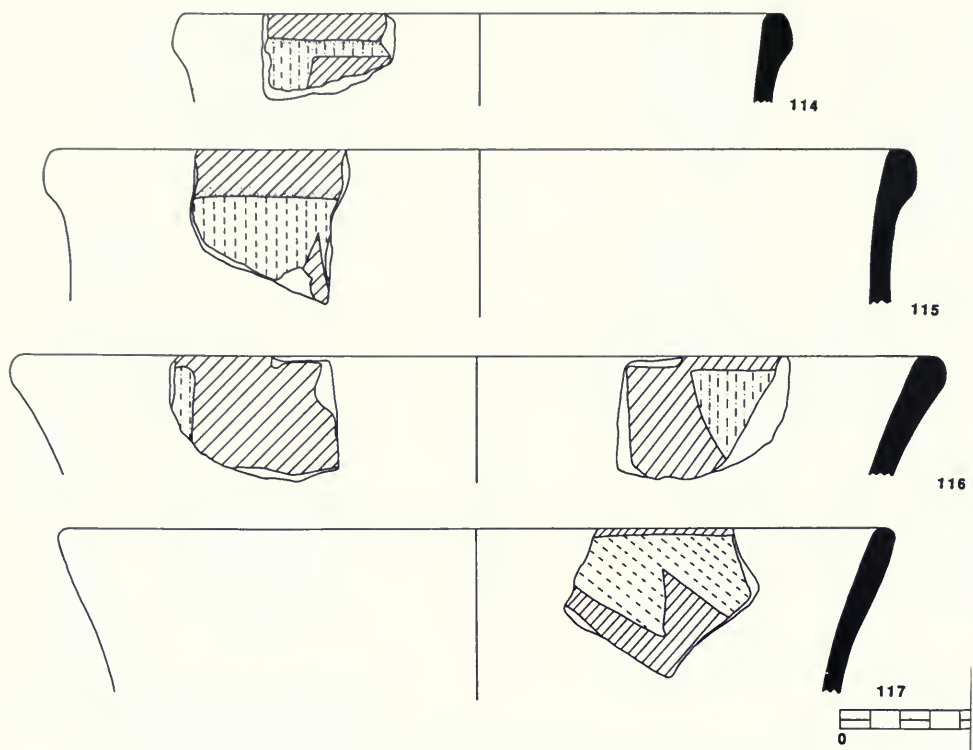
Figs. 97–102. Early Sillumocco–Qaluya incised and painted ceramics. 97–100, Paste 1; 101, 102, Paste 5.



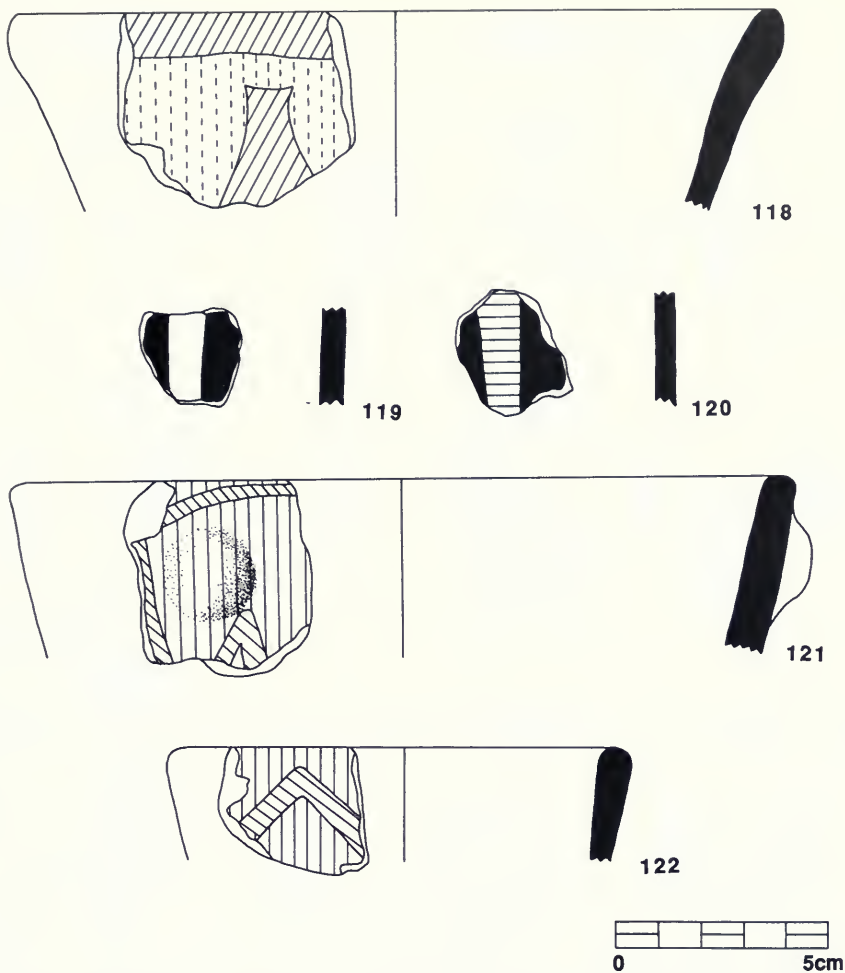
Figs. 103–104. Early Sillumocco–Qaluyu painted ceramics. 103, Paste 6; 104, Paste 4.
 Figs. 105–106. Early Sillumocco–Chiripa incised ceramics in Paste 5.



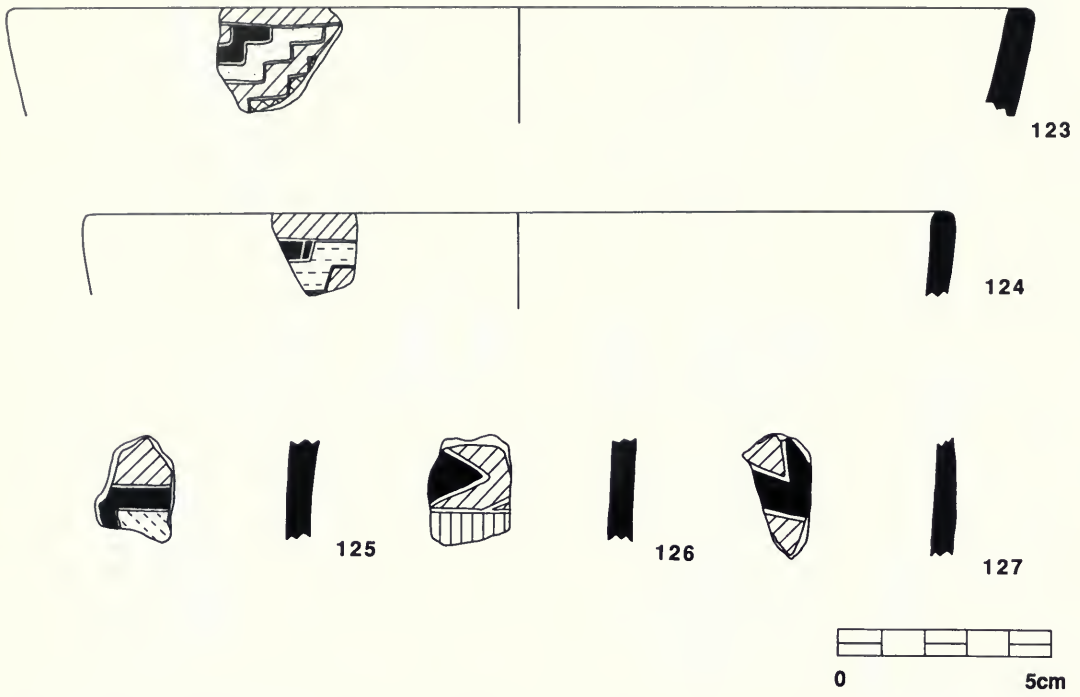
Figs. 107–113. Early Sillumocco–Chiripa incised ceramics. 107–110, Paste 5; 111, 112, Paste 9; 113, Paste 6.



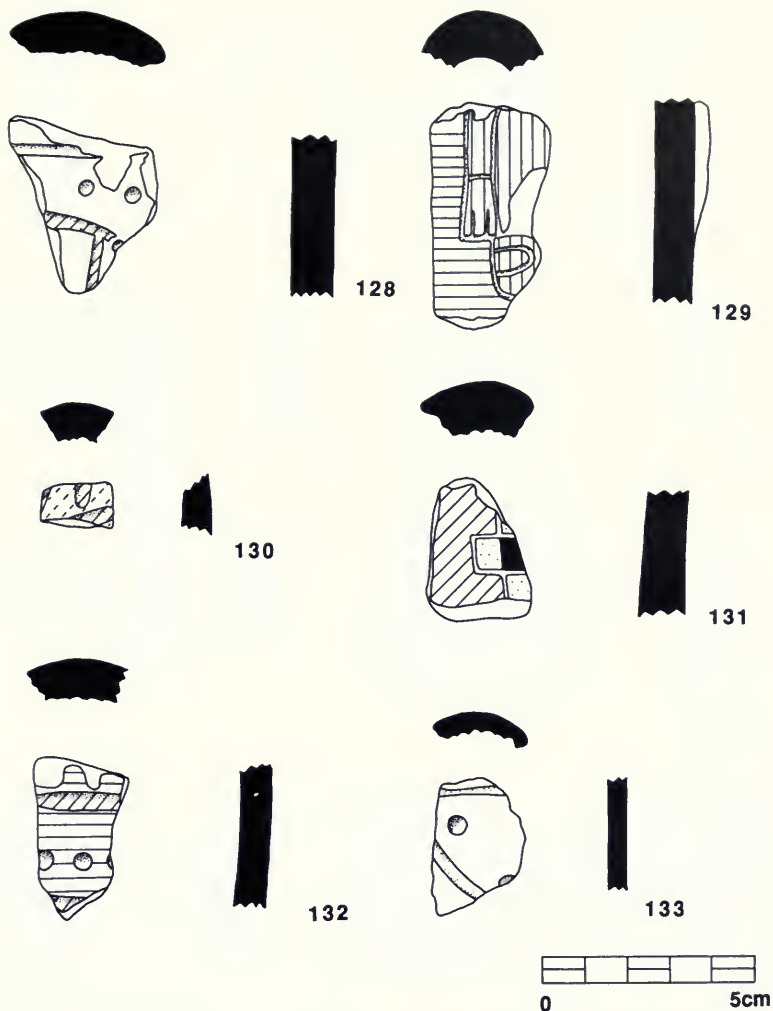
Figs. 114–117. Early Sillumocco–Chiripa painted ceramics. 114–116, Paste 5; 117, Paste 9.



FIGS. 118–122. Early Sillumocco–Chiripa painted ceramics. 118, Paste 6; 119, Paste 5; 120, Paste 9; 121, 122, Paste 5.



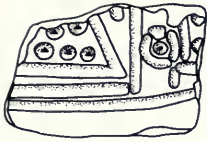
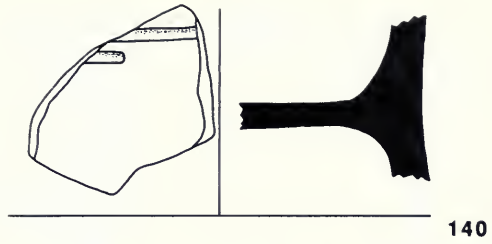
Figs. 123–127. Late Sillumocco polychrome incised ceramics. 123–125, Paste 3; 126, Paste 1; 127, Paste 2.



Figs. 128–133. Ceramic tubes or trumpets. 128, Paste 7; 129, Paste 5; 130–132, Paste 3; 133, Paste 1.



Figs. 134–139. Paste 1 incised ceramics. 134–136, group A; 137–139, group B.



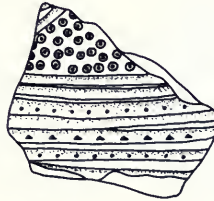
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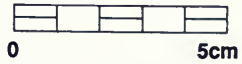
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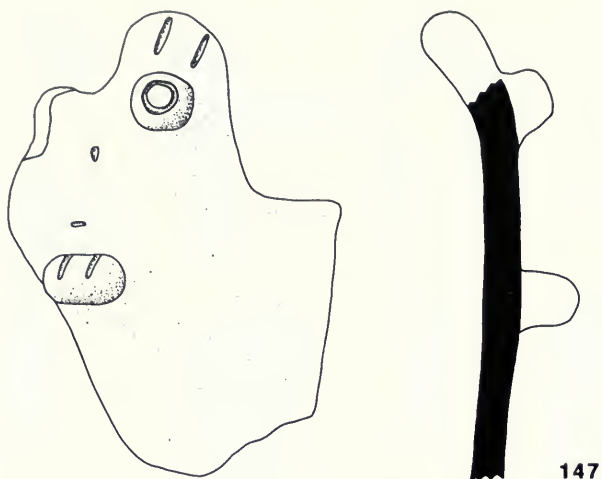
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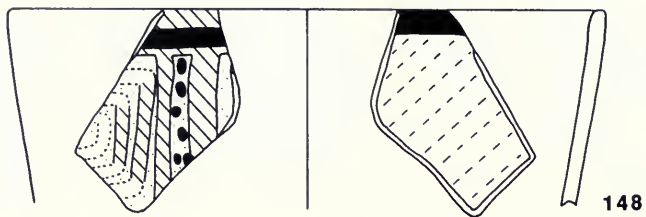
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FIGS. 140–146. Paste 1 incised ceramics, group C (140–144 are slipped red, 145 is unslipped, 146 is slipped cream).



147



148



149



150

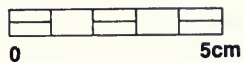
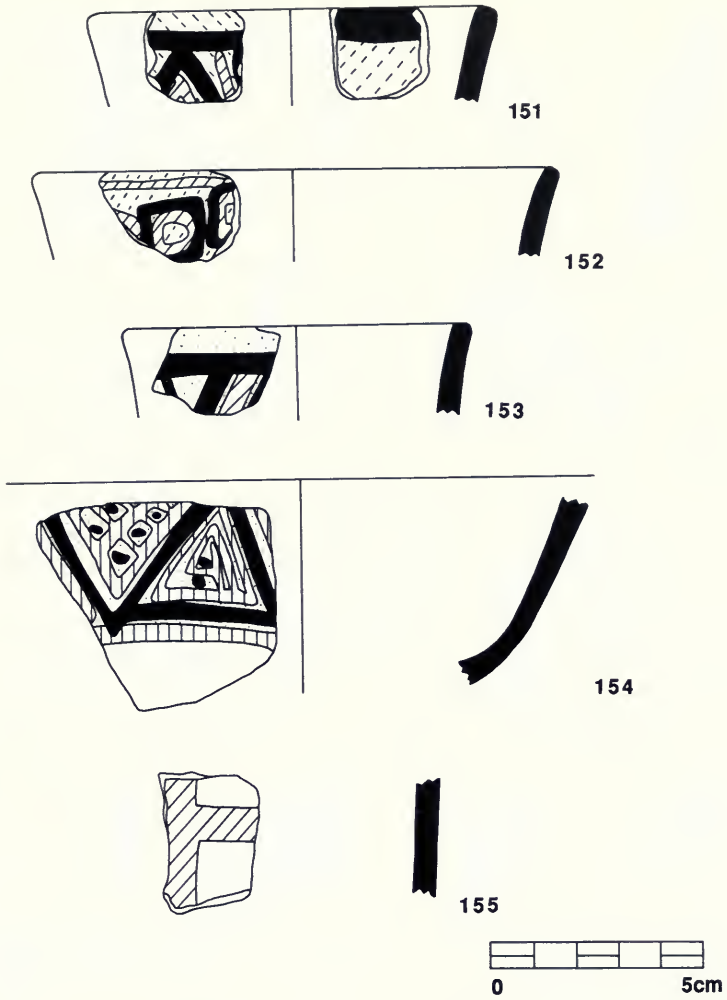
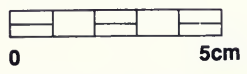
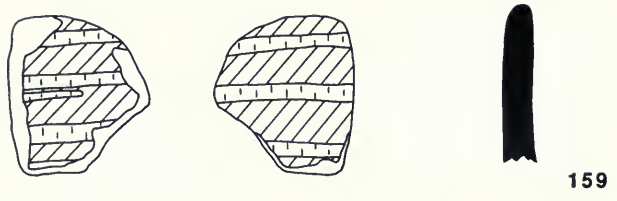


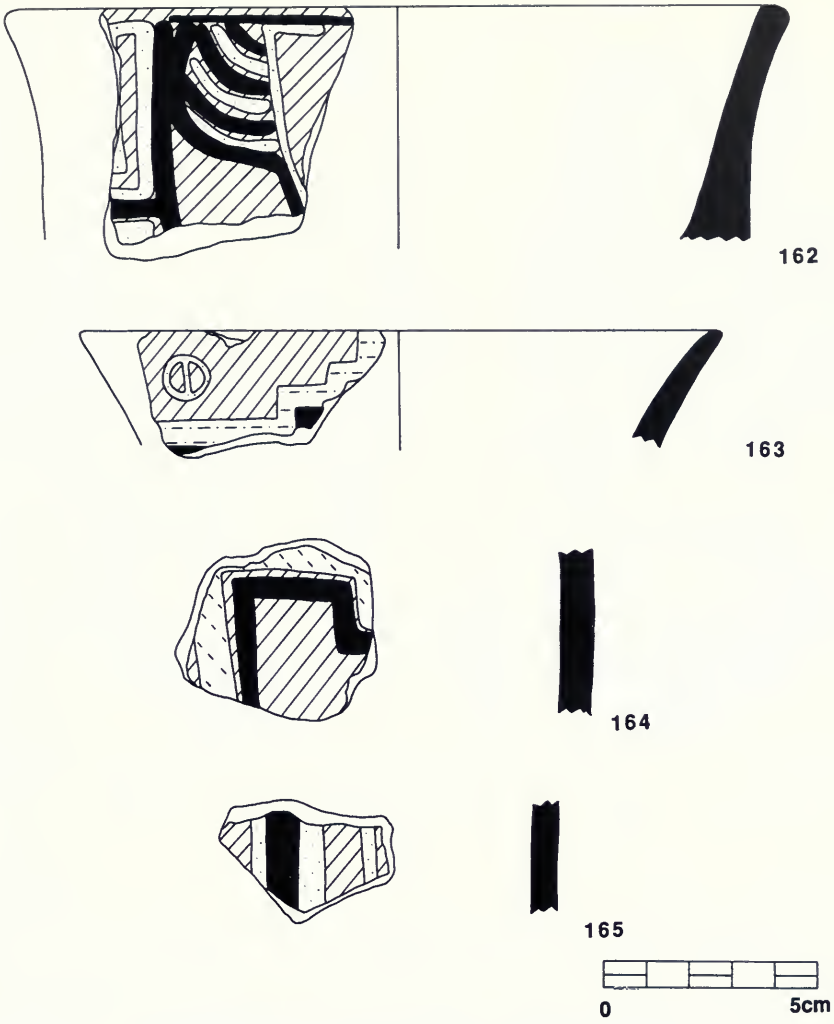
FIG. 147. Paste 1 incised and modeled feline head.
 FIGS. 148–150. Late Sillumocco–Qeya painted ceramics in Paste 10.



FIGS. 151–155. Late Sillumocco–Qeya painted ceramics. 151, Paste 10; 152, Paste 1; 153, 154, Paste 2; 155, Paste 3.



Figs. 156–161. Tiwanaku painted ceramics. 156–159, Paste 1; 160, 161, Paste 13.



FIGS. 162–165. Tiwanaku painted ceramics in Paste 5.

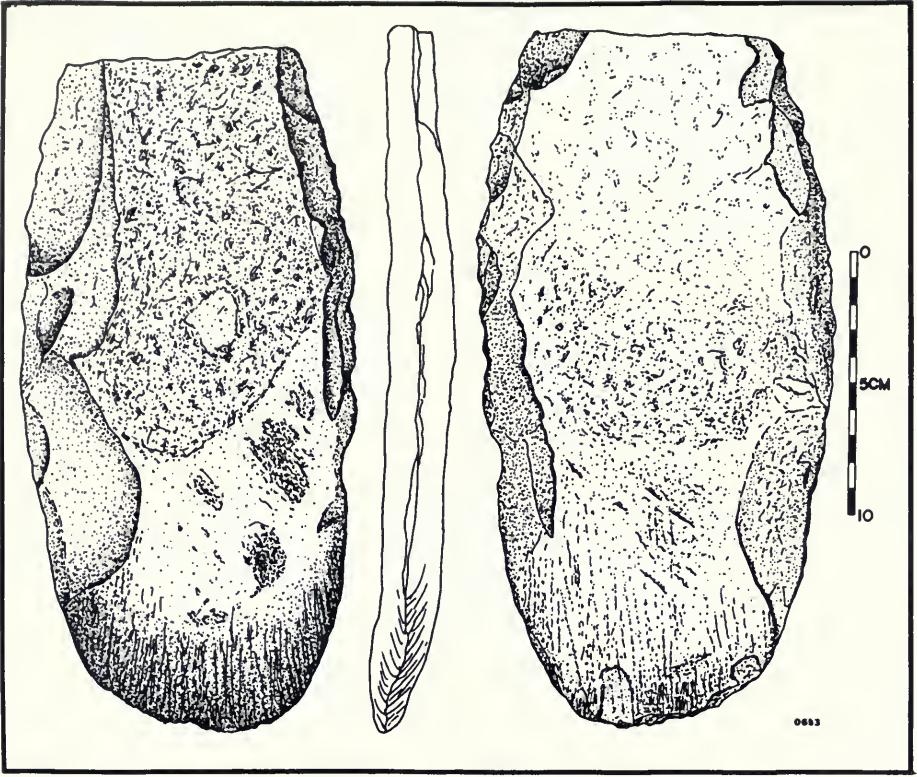


FIG. 166. Complete hoe.

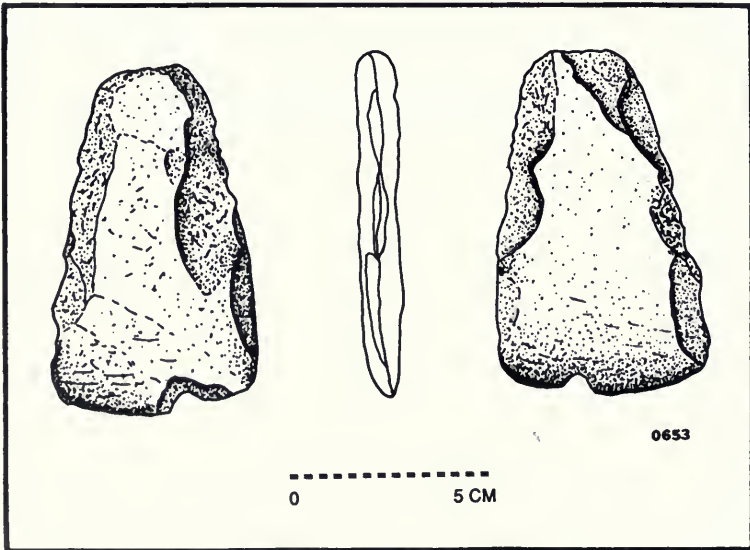


FIG. 167. Complete adze.

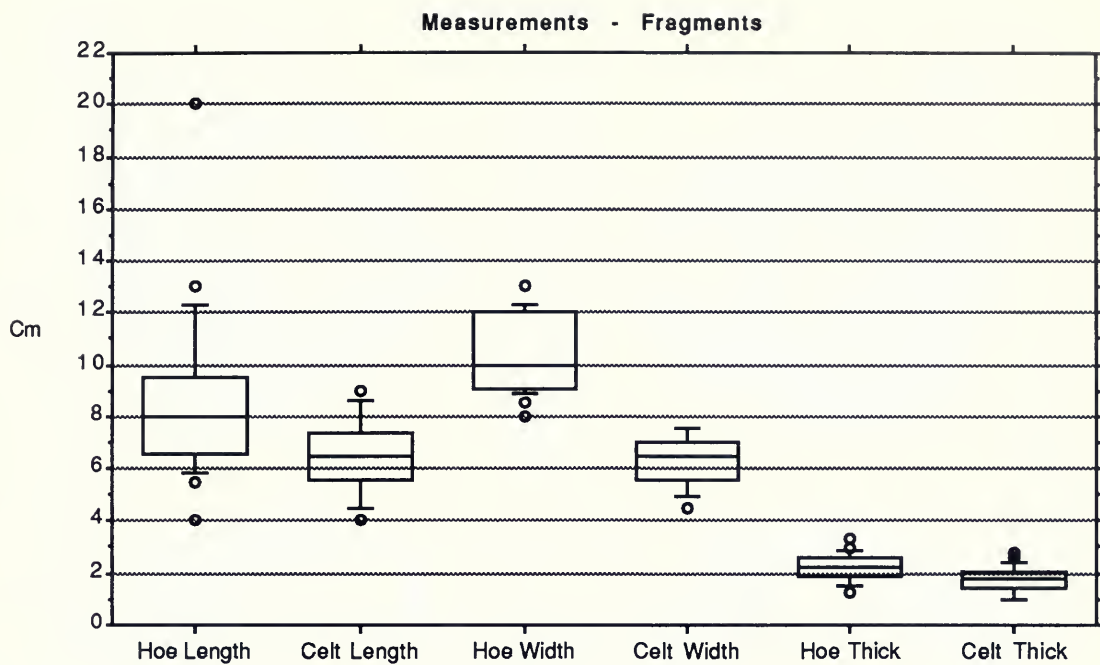


FIG. 168. Hoe and adze (celt) dimensions.

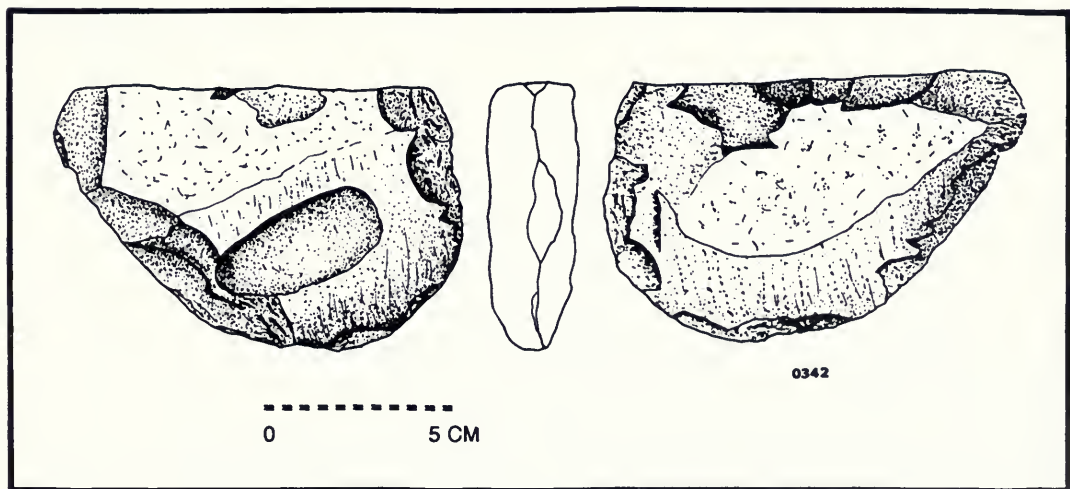


FIG. 169. Hoe fragment.

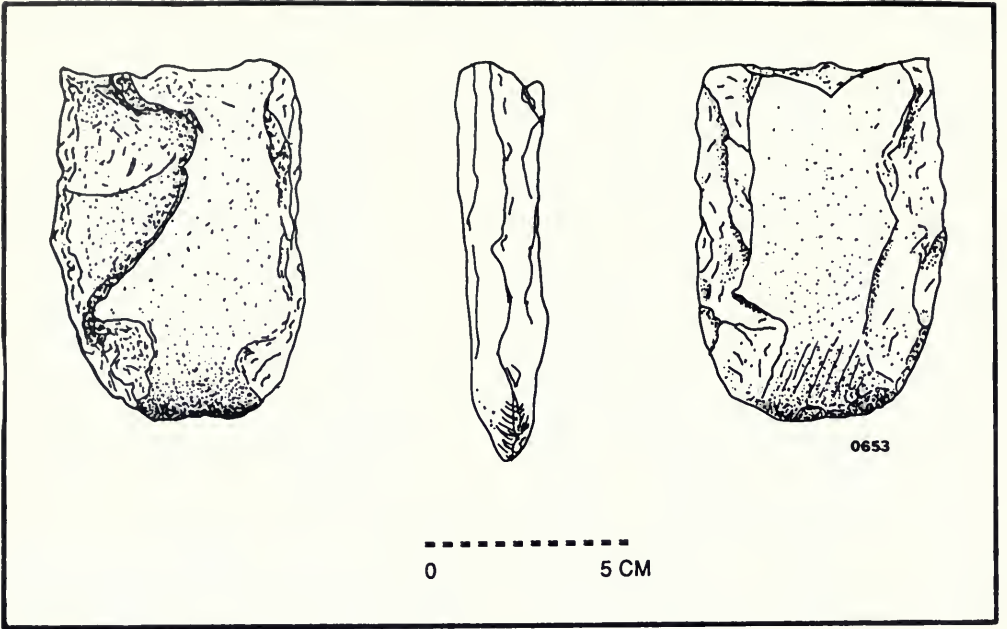


FIG. 170. Adze fragment.

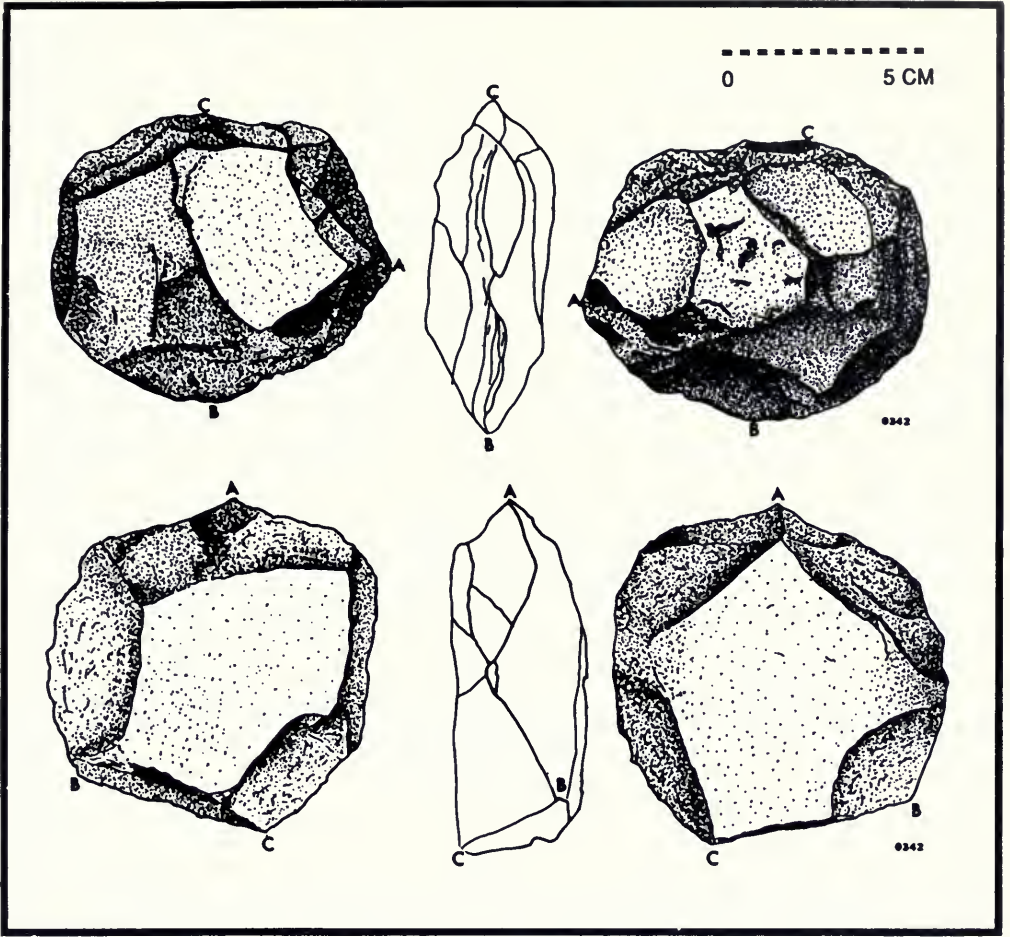


FIG. 171. Discoids.

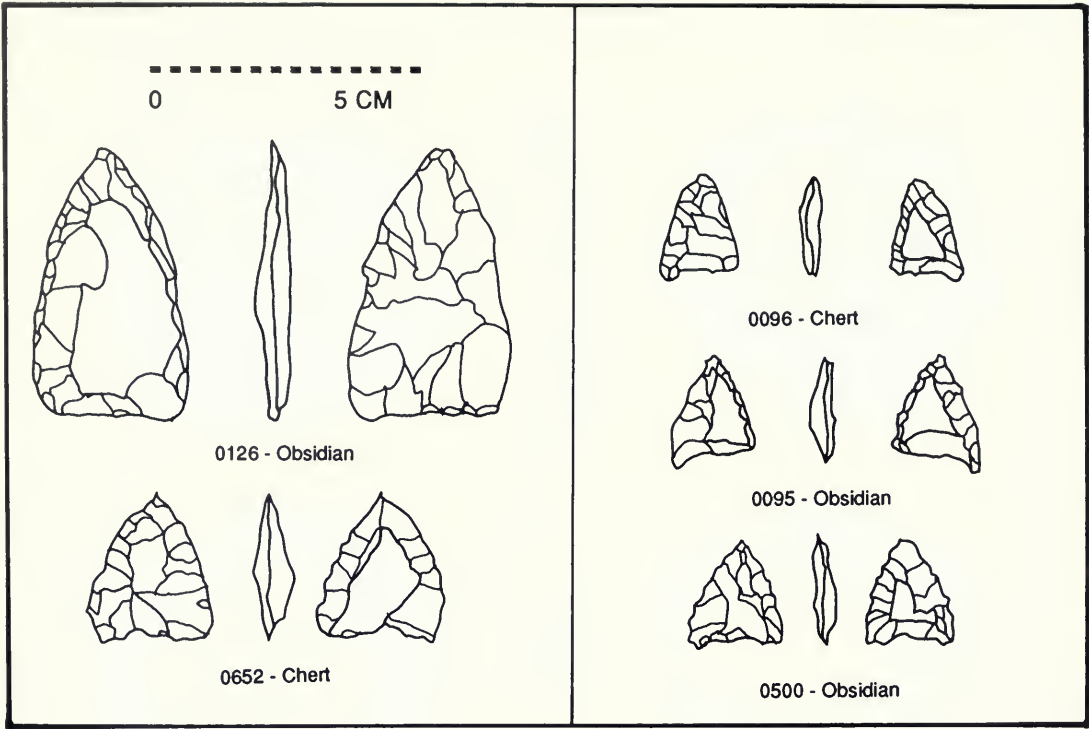


FIG. 172. Triangular projectile points.

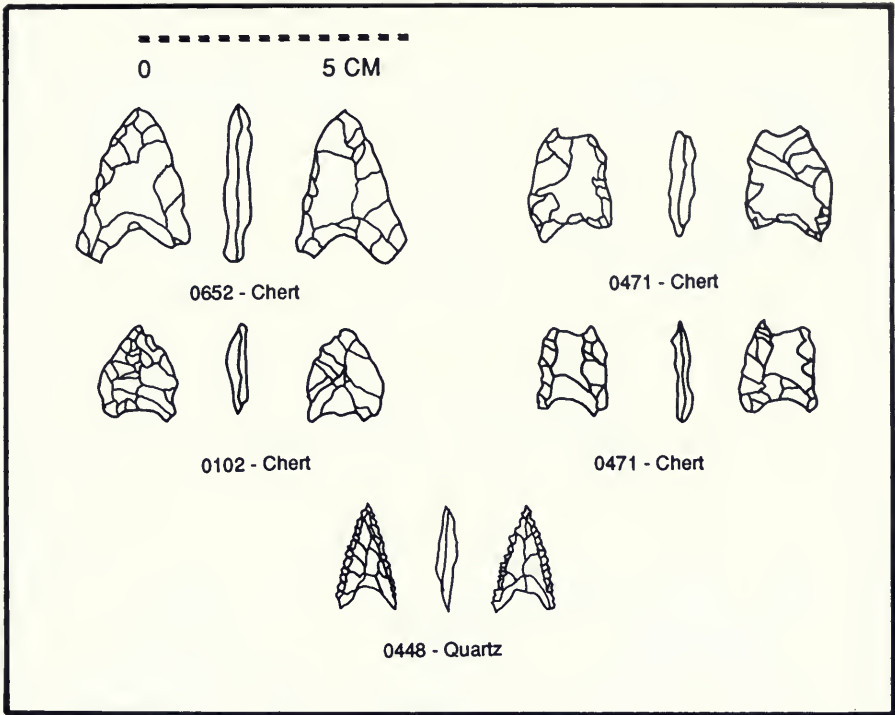


FIG. 173. Concave-base projectile points.

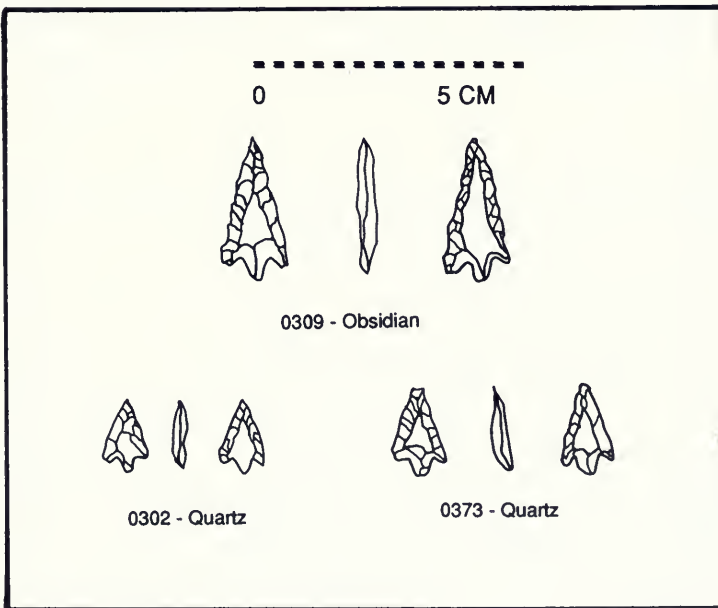


FIG. 174. Corner-notched projectile points.

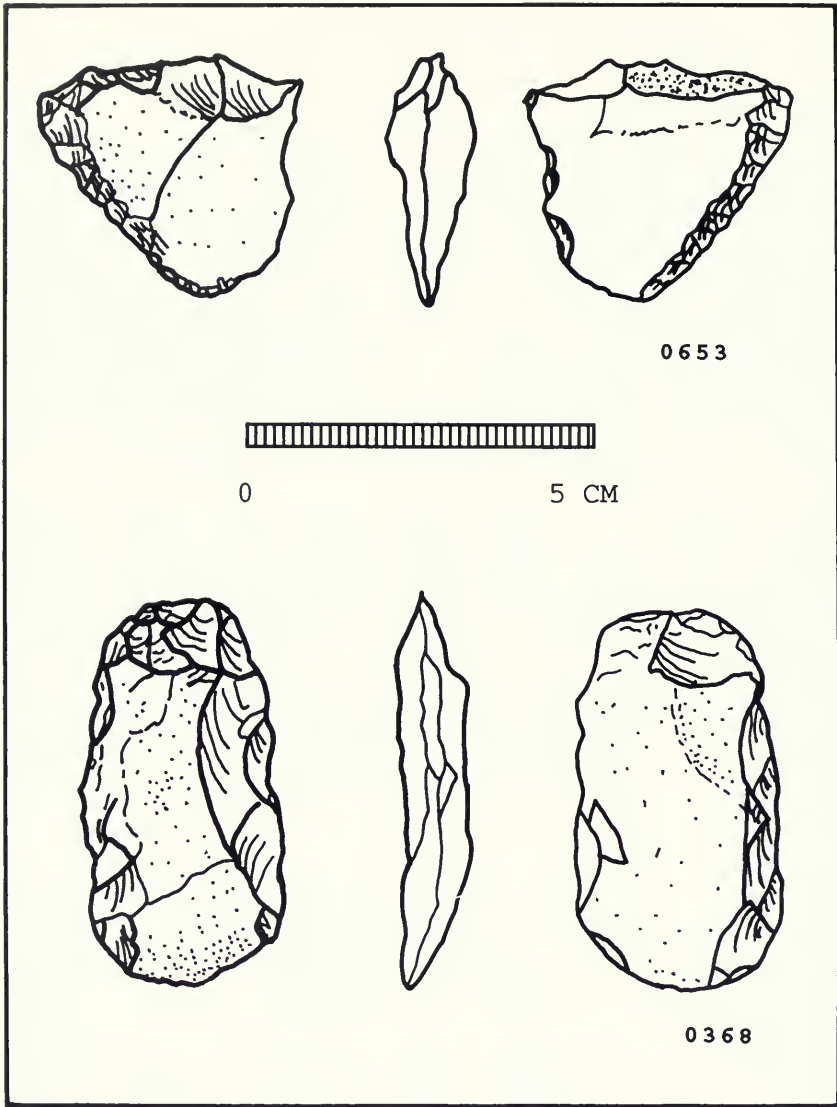
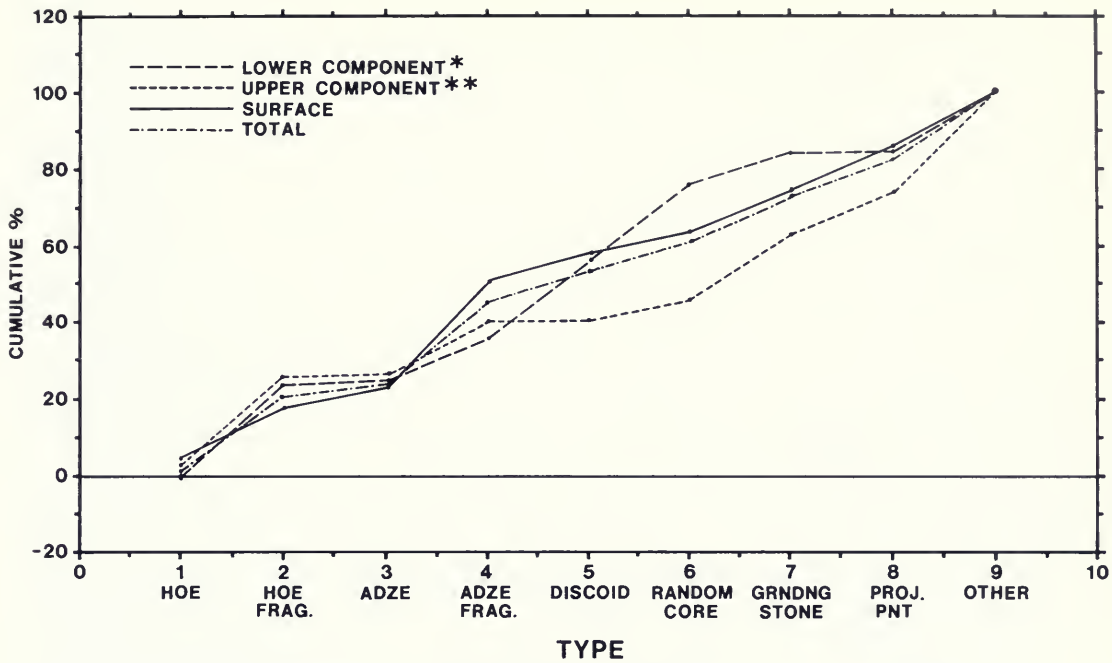


FIG. 175. Scrapers.



* FIRST CONSTRUCTION ** SECOND CONSTRUCTION

FIG. 176. Cumulative percentage of tools by component.

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