TRADITIONAL POTTERY OF RAQCH'I, CUZCO, PERU: A PRELIMINARY STUDY OF ITS PRODUCTION, DISTRIBUTION, AND CONSUMPTION

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The pottery-making village of Raqch'i is located on the Cuzco-Puno highway, 19 km. north of Sicuani and about 120 km. southeast of the city of Cuzco, in the district of San Pedro de Cacha, province of Canchis, department of Cuzco (fig. 1 locates the places mentioned in this article). It is 3 km. northwest of San Pedro de Cacha and 5 km. southeast of Tinta, on the Vilcanota River at an elevation of about 3480 m. Two nearby communities, Q'eya (ca. 1.5 km. southeast of Raqch'i), and Chiknu (ca. 3.5 km. northwest), also make pottery. Raqch'i and Q'eya are both ayllus of San Pedro de Cacha, and Chiknu is an annex of Machaqmarka, an ayllu of Tinta. Raqch'i is nestled at the foot of an old lava flow of the volcano Kimsach'ata (=three peaks), and in the immediate vicinity there are several archaeological sites, including the well-known Temple of Wiraqocha.

To my knowledge, the earliest mention of Raqch'i as a pottery-producing village is in Cosme Bueno (1951, p. 103), who reports ceramic production and trade in the vicinity of "Racche" in 1769. In the nineteenth century, both Squier (1877, p. 411) and Middendorf (1974, p. 342) refer to the community as producing ceramics.

I am aware of only two individuals who have reported on the traditional ceramics produced in this immediate area. Dean Arnold, who visited Raqch'i and nearby Machaqmarka very briefly in December 1972 and Raqch'i again in March 1978, mentions these locations (1985) as well as Q'eya and Tinta. Gertrude Litto visited South America for ten months beginning in October 1971, surveying a large number of pottery-producing villages, including "Machacmara" which she describes in some detail (Litto, 1976, pp. 22-31), Chita Pampa near Cuzco, and Checca Pupuja and Pucara in Puno.

My interest in Raqch'i ceramic production began in 1967, while excavating at nearby Pikicallepata. The interest intensified when I concluded that the area was the origin of a widely-distributed Early Horizon ceramic ware with volcanic glass temper (Chávez, 1982, pp. 272-301). My formal investigation of modern Raqch'i pottery, upon which this article is based, began in July 1971, and continued in July 1973, August 1974, and January and July 1985. I was assisted throughout by Sergio J. Chávez who, among other things, carried out interviews in Quechua, permitting the inclusion of native terms for forms, materials, tools, and processes.[1] Some interviews were in Spanish, and some were taped to permit checking against notes. Photographs were taken, and drawings of tools and pottery forms were made. Samples of temper and of raw and prepared clays were obtained for future analysis. Florentino Camino Quispe, caretaker of the ruins, served as our primary informant, and we have stayed in his house during each visit since 1967. In addition to Camino, who no longer makes pottery, four other potters were also interviewed and observed in the process of making pottery: Leonarda Camino, his daughter; Martín Rodríguez Camino, his nephew; María Quifle Quisluyo, Rodríguez's wife; and Nicasio Mamani, Camino's distant cousin.

Raqch'i potters use local clays and volcanic temper to produce small press-molded bowls and large, coiled, flat-based vessels built on a ceramic disk turntable. Generally, women make the former and men the latter, so that each marriage forms a new pottery-producing unit, the family. The family may have to acquire

forms elsewhere in the village if it cannot produce a full complement itself (since single forms cannot be fired alone), resulting in some intravillage distribution, achieved through *mink'a*, an institutionalized means of obtaining extrahousehold labor.

Almost all families in Raqch'i produce pottery, primarily during the dry season, for distribution at distant fairs, periodic markets, and individually in Raqch'i. Raqch'i pottery transport their wares over a vast area, from Ollantaytambo to Maranganí, and from these points others distribute it elsewhere. Raqch'i families must make pottery to supplement their otherwise insufficient agricultural production. Pottery may be sold but, most importantly, can be exchanged directly for needed produce. The dry season scheduling of pottery making does not conflict with agricultural activities, coincides with the dates of the annual fairs that are tied to Catholic festivals, and occurs when conditions are most favorable for production and transportation.

In a regional context, there is a complementarity of vessel forms related to function that corresponds to two vertical ecozones within the region. Only high-elevation villages in the puna or altiplano produce vessels that can be repeatedly exposed to fire (like cooking pots), while lower-elevation villages in valleys, such as Raqch'i and the nearby communities of Q'eya and Machaqmarka, specialize in containers, especially those related to the maize and *chicha* (beer, usually of maize) production of these lower areas.

I shall argue that socio-economic interdependence is artificially maintained by technological factors and the organization of production at the household, village, and regional levels. Furthermore, this interdependence serves to even out the distribution of needed resources or to provide greater access to them. The male-female complementarity of vessel forms, the requirement of a full complement of vessel forms for firing, the ecozonal complementarity of vessels having different functions, and even village specialization itself appear to be artificially maintained. For example, within a given ecozone at the regional level, there is interdependence as pottery producers acquire needed food and nonproducers needed pots. Between ecozones, there is interdependency since both producers and nonproducers need a full repertoire of vessels; when pots move vertically, so does the cultivated food exchanged for them. Annual fairs provide one locus for this and other regional resource distribution to occur.

Despite the amount of data obtained, this study must remain preliminary. Only a small number of potters were interviewed and/or observed in Raqch'i, which is, in turn, only one of three pottery-making communities in the area that merit investigation; the sample was both limited and nonrandom. Future investigagation should also involve, for example, pottery-making villages in both ecozones and pottery-distribution locations, such as fairs and markets. Experiments and technical studies need to be carried out to determine whether the technological limitations described here as imposed upon themselves by the potters are necessary, and comparison could be made to prehistoric pottery.

Vessel Forms and Their Functions

The following list includes all the vessel forms and functions that were recorded, but other forms, variations, or functions may exist.[2]

Coil-built forms with flat bases made on ceramic turntables (*moldes*)

1. ***P'ampana***: A very large, wide-mouthed container, like a *raki* in form, about 1.45 m. high, built of 17-20 coils. Although no longer made today, a *molde* used to make the *p'ampana* (fig. 14) was seen.
   This form was used to ferment and store a large quantity of *chicha* for celebrations with many people in attendance.

2. ***Raki*** (diag. 1, figs. 3, 4, 39): A large, wide-mouthed container (exterior rim diameter of vessel in fig. 4 is 54.5 cm.), with flaring neck, is said to weigh 25-30 pounds (none was weighed). The globular body has two vertical handles, and narrows to a flat base. Size variants include the *hatun raki* (large *raki*) and the *huchuy raki* (small *raki*).
   Form is used to ferment and store *chicha*, to store grain and probably other items, and as a flowerpot.

3. ***Qocha urpu***: A very large, small-mouthed container, like an *urpu* in form, but a *p'ampana* in size. No longer made today, it is the largest vessel shown in the painting in fig. 2. Estimating from this painting, rim diameter was about 60 cm. and height about 1.80 cm.
   This form was used to ferment and store a large quantity of *chicha*.

4. ***Urpu***: A large, small-mouthed container (rim diameter about 19 cm.), like the *raki* in size and form except for its narrower mouth.
   Form is used to ferment and store *chicha*, and to store grain.

5. ***Mak'a*** (fig. 3): Tall, narrow-mouthed jar with two vertical handles.
   Form is used to store grain and *chicha*.

6. ***Tumin*** (figs. 3, 5): A smaller, tall, narrow-mouthed jar with two vertical handles.
   Form is used to carry *chicha* and water, the small mouth preventing spillage. A plug of cloth or of corncobs tied with string may be used to cover the mouth (M. Farfán de Chávez, pers. comm., June 1973), as may cowhide lids or plugs; plastic is now tied over the mouth.

7. ***Kamaña*** (figs. 3, 6): A globular jar with two vertical handles and a low shoulder angle.
   Form is used to separate *chicha*, e.g., to carry boiling *chicha* from the pot it was boiled in to the *raki* for fermentation, or to dip it from the *raki*.

8. ***Chamaka*** (figs. 3, 7): A wide-mouthed container with incurved rim and two vertical handles.
   Form is used to carry potatoes and hold them while peeling, to hold *phuspu* (boiled broad beans) after they have been cooked, for washing, and for holding *chuño* (a form of freeze-dried potato).

9. ***Aysana*** (figs. 3, 8): A pitcher with one vertical handle and a pouring spout.
   Form is used to hold and pour liquids.

10. ***Lavador*** (Spanish = washbasin) (fig. 40): A large bowl or basin with flaring walls.
    Form is used for washing.

11. ***Wich'i*** (fig. 9): A wide-mouthed container with one vertical handle and a pouring lip.
    Form is used as a chamberpot; container for milking; and to wash, soak, and sort beans, *chuño*, and grains before cooking. Previously used as a dipper, like the gourd dipper.

Press-molded forms with rounded bases

12. ***Puruña*** (fig. 10): A large, flaring bowl. Size variants include the *hatun puruña* (large *puruña*).
    Form is used for washing people (especially the *hatun puruña*) or clothes; in peeling potatoes or other vegetables; and in various stages of ceramic production, especially as a mold for reproducing the same form.

13. ***Chillaku*** or ***huchuy puruña*** (small *puruña*) (fig. 3).
    Form used in peeling vegetables; in ceramic production, especially as a mold for reproducing the same form.

14. ***P'uku*** (figs. 11-13): A small, open, hemispherical bowl of various sizes, including the *una p'uku* (fig. 13; small *p'uku*) and the *malta p'uku* (medium *p'uku*). Some *p'uku*s have annular bases (fig. 12), called *tianachayoq*.
    Form is used for serving food at home or, commercially, outside; in ceramic production, especially as a mold for reproducing the same form. Small ones are used as lids and as containers or ashtrays for sale to tourists.

Other forms

15. ***Molde*** (figs. 14-19). A disk or platelike ceramic support of varying size, sometimes with a pedestal.
    Form is used in the production of coil-built vessel forms.

16. ***Tiles***: No longer made, this form is used for roofing.

17. ***Imitation Inca forms***: Forms like *kero*s, or beakers, were reported, in 1974, to be made for sale to tourists.

18. ***Azucarero*** (Spanish = sugarbowl): Form was not seen, but reported in 1985; it is used to hold sugar.

This form classification is based on technique of manufacture, which indirectly determines the base shape, but there is another based on size, which is related to season of manufacture, as Camino pointed out. The largest coil-built forms (*raki*, *urpu*, and small *raki*) are called *hatuchaq* (largest) and are produced only in the dry season, primarily for the August fairs. All other forms, both coil-built and press-molded, are called *khullu* (smallest), and, in addition to their production for the August fairs, may be made in small quantities throughout the year.

Coil-built forms with flat bases made on ceramic turntables (figs. 4-9)

Of the two basic forms used to ferment *chicha*, the small-mouthed versions (*qocha urpu* and *urpu*) are said to be preferred by people living at higher elevations, e.g., Pomacanchi, Sangarará, Marcaconga, and Yanaoca. In contrast, the wide-mouthed forms (*p'ampana* and *raki*) are preferred by people living at lower elevations where maize and *chicha* production flourish, e.g., Cuzco, Tinta, and Calca. Camino had no explanation for the difference in the two forms, and only pointed to the need for a large neck diameter in the *raki* to dip out the *chicha*. When pressed about the *urpu* in this regard, he said the *chicha* would have to be poured out, since a jar for dipping would not fit.

Professor Rodney C. Kirk, cultural anthropologist at Central Michigan University, suggested that the variation may relate to differential fermentation rates, which vary with temperatures determined by altitude (pers. comm., February 1977). As sugar is converted to alcohol, the released carbon dioxide produces foam, which

seals out oxygen preventing the liquid from turning to vinegar, since anaerobic bacteria cause fermentation. At higher temperatures (lower elevations), fermentation would be faster, and the large amount of foam produced would overflow if the vessel had a narrow mouth, while at lower temperatures (higher elevations), a narrow mouth would prevent dissipation of the smaller amount of carbon dioxide foam covering the liquid. Other variables may be involved in the choice of vessel form, however, including the grain used to make the *chicha* (e.g., maize in valleys and quinoa at higher elevations).

The flaring neck of the *raki* accomodates a basket containing grass used to strain boiling *chicha*. Camino stated that the strainer they use in Raqch'i is not a basket, but rather a coarsely woven cloth, placed over the vessel mouth and tied at its neck. They boil *chicha* in a pot called *k'auchimanka*, made in Pucara, although large tin containers are now used. The large size of the mouth and neck facilitates dipping out the *chicha*, using a *kamaña* or a gourd dipper (Martha Farfán de Chávez, pers. comm., November 1982).

The *p'ampana* and *raki*, when in use, may be set partially into the ground; in fact *p'ampana* literally means "for burying." According to Camino, in *chicherías* (public places where *chicha* is made and sold), the base of the *raki* is fitted into a hole, about 10-15 cm. deep with pulverized dung at the bottom, made in the dirt floor. He also noted that the *p'ampana* used to be partially buried in a similar hole to prevent it from tipping over, and make it easier to dip from. I observed a *raki* in a Cuzco *chichería* (January 1983) that was buried to within one span below the handles in the dirt floor, and was told that it was buried in ash and grass. Burying such a large vessel strengthens the walls that must support the heavy liquid, and apparently contributes to maintaining a fairly constant temperature, which is important in the fermentation process.

The largest *chicha*-fermenting forms (*p'ampana* and *qocha urpu*), no longer made today, were previously in demand. People from Pomacanchi, Sangarará, Marcaconga, and Yanaoca would order *qocha urpus* as part of the marriage obligation, in which the parents of the bride provide the vessel as a gift to the husband-to-be. Their larger size could supply *chicha* to greater numbers of people than the *raki* and *urpu*.

Large vessels, such as the *raki*, *mak'a*, and *tumin*, are carried on men's or women's backs, supported by a llama-fiber rope passed through the handles (Litto, 1976, p. 28 top), or can be tied to the backs of burros, also using the handles. The handles, then, aid in the transport of these vessels.

Press-molded forms with rounded bases (figs. 10-13)

According to one consumer (Martha Farfán de Chávez, pers. comm., June 1973), the mother and father of a family have the largest *p'ukus*, and the size of a child's *p'uku* corresponds to the size of the child. In addition, *p'ukus* may be used to serve food to visitors, to serve food for sale, and to measure a single serving.

Aside from various everyday containing, serving, and washing functions, the press-molded forms play an important role in ceramic production. Vessels of each shape are used as molds for the production of their respective forms. *Puruñas* are also used in various stages of pottery making: to receive sifted temper, to measure quantities of clay and temper (figs. 20-21), to contain the ash used as a

parting agent (fig. 33), and to lift the hot coals used to start the fire for firing. Similarly, the *chillaku* is used as a water dish during pottery making (figs. 34-35, 41-45), while *p'ukus* serve as containers for temper (figs. 33-35) or parting agent (figs. 41-45).

Disk-shaped *moldes* (figs. 14-19)

Moldes are ceramic supports used on a stone slab to rotate the coil-built forms during their manufacture. They are numerous and of various sizes; larger ones lack the pedestal that smaller ones have. Potter's marks, absent on other forms, may occur on *moldes*, e.g., as circles incised with wire on the upper surface (fig. 18), or lettered initials incised on the exterior. Both the marks and the initials serve to identify to whom the *moldes* belong, since they are borrowed by other potters.

The relative lack of documentation for these turntable disks has been pointed out by John Rowe and Patricia Lyon (O'Neale, 1977, p. 41). All of the supports discussed below are turned on a stone slab in forming pottery.

Litto (1976, pp. 28-30) describes and illustrates the fired-clay turntables used by pottery of Machaqmarka, just north of Raqch'i, as well as in Chita Pampa near Cuzco (p. 21). Those in Machaqmarka are called *pocos* (*p'ukus*?); this term was not used in Raqch'i. These turntables, consisting of a disk with a cylindrical pedestal, are like the smaller Raqch'i supports in form and dimensions. Linné describes and illustrates similar *moldes*, which he calls a "sort of potter's wheel," used in Tirapata in the northern Lake Titicaca Basin (Linné, 1925, p. 95, fig. 28). Tschopik (1950, pp. 203, 209) describes flat pottery plates (*pallalla*) used as supports in pottery making in Chucuito. The folklore students of the University of Cuzco (Cátedra de Folklore, 1966, pp. 127, 144), Spahni (1966, pp. 40, 43), Litto (1976, pp. 32, 34), and Panyella (1981, fig. 729) mention the use of disks with pedestals (*moldes* or *moldecitos*) in Checca near Santiago de Pupuja, and they are also used in Pucara, both locations in the Lake Titicaca Basin. Disk supports are also used in the Ayacucho area (Spahni, 1966, pp. 61, 74-75; Arnold, 1972, p. 862, pl. b; Litto, 1976, p. 42); in Quinua the support consists of two disks, a slab (*tiapo*) of lime cement or volcanic tuff on a ceramic or plaster plate, turned as a unit on a tile or flat stone. Similarly, in Huayhuas near Ayacucho, two-piece pottery supports (called *molde*) are used, one larger disk on a smaller one (O'Neale, 1977, pp. 44-45, fig. 22). Ravines (1978, p. 450) mentions disks or "*plato-moldes*" (*muyupu-chaca*, *chaca*, or *tiapu*) used in Ccaccasiri, Huancavelica. Small disks have pedestals while large ones are convex like Raqch'i examples. O'Neale (1977, p. 50, fig. 33), who calles them foundation disks (called *moldes*), also indicates that one-piece examples from Mito Alto near Huancayo have the owner's initials scratched on them. Similarly, Lavallée (1967, p. 107, throughout), who calls the disk and the stone slab a "false-wheel," says that each potter, in Aco near Huancayo, engraves his name and sometimes the date of manufacture in the center of the disk. Finally, Tello (1938, pp. XIV-XVI) refers to ceramic disks (called *tilla*) from Ancash.

The disks reported in the literature and, presumably, a particular ceramic forming technique are distributed only in the highlands, at least from Ancash in the north to Chucuito in the Lake Titicaca Basin in the south. However, the use of such *moldes* also occurs today in the Ica Valley on the south coast (John H. Rowe, pers. comm., January 1984). Arnold (1981, p. 37) has argued that this forming technique involving a turntable support corresponds to Quechua speakers in the Central Andes, but the Chucuito case, being Aymara, invalidates his suggestion.

Since Lavallée discussed the antiquity of such turntable discs in 1967 (p. 119), new evidence has come to light. With one exception, however, archaeological examples have not been published, perhaps because archaeologists have not recognized them as such. The oldest known disk, from Paracas on the south coast, has a figure incised on it and dates to Early Horizon 10 (J. H. Rowe, pers. comm., 1984). Rogger Ravines (1977, pp. 53, 54, 71, fig. 61) reports a "*plato de alfarero*" possibly related to the Middle Horizon 2A offering deposits from Ayapata, Huancavelica; Max Uhle collected such a plate, of late date, in Ica (J. H. Rowe, pers. comm., 1984); and an Inca *molde* was found at Tipón, an Inca site near Cuzco (J.H. Rowe, pers. comm., 1984). At the site of Qaluyu just north of Pucara, I recovered a pedestaled *molde* in a mixed upper level of uncertain, late or even modern age. The provenience of these specimens points to a south coast or south to south-central highland distribution prehistorically; while the use of non-Spanish terms for the modern *moldes* in Ancash, Huancavelica, Chucuito, and possibly nearby Machaq-marka, further suggests a pre-Hispanic occurrence in these regions; and the form of the upper surfaces of Raqch'i *moldes* suggests the basal form of such Inca vessels as the so-called aryballus.

Production

Clay and temper procurement and preparation

Clay (*allpa*) is obtained from locations on the plain called Allpapata just south of Chiknu, or Machaqmarka, on the east side of the Vilcanota River. The clay belongs to the Tinta town council, and Raqch'i potters pay a fee of 20-100 *soles* per year (July 1971, when the *sol* was at $.0235) to remove it. Pits are dug into the plain to extract the two kinds of clay used in paste preparation: *ura allpa*, a fine quality clay from 1-2 m. deep in Ura'allpapata; and *hawa allpa*, a poorer quality clay from a depth of 30-50 cm. in Hawa'allpapata, some 200 m. away. Although there are other places in the area to obtain clay, Ura'allpapata yields the best quality. Machaqmarka potters use only this fine quality clay in the preparation of their paste.[3]

Temper, referred to as "sand" (*aqo*), is procured from around the volcano, Kimsach'ata, just above the community (fig. 1). Raqch'i potters had free access to this material until about 1982, when they agreed to pay the community for temper in order to increase its funds. A sample of this temper was identified geologically as pyroclastic material, namely volcanic cinders, consisting of basaltic scoria or basaltic cinders.[4] It is volcanic glass, and can be called a glassy scoria-ceous emanation; it is not pumice. Although the same clay is used for *moldes* as for vessels, these disks are made with a finer *aqo*, called *hanku aqo*, found lower on the volcano; this temper was not sampled or observed firsthand.

Temper is dug from the ground surface around the volcano, and screened (*suysuy*) there, using a coarse sieve. Only the fine "sand" (*ñut'u aqo*) is brought home, born by either people or burros, leaving the coarse portion (*chharqa*) at the source. The *aqo* is screened a second time in the house, using a finer, round sieve, made from a metal can with holes punched with a nail; a *puruña* holds the screened *aqo* (fig. 20). The temper is never ground; I was told that it would be difficult to do so, and sufficiently fine temper is already abundantly available. The major need for fine temper is to permit a "good" surface finish, since coarse fragments would drag, and mar the surface in the process of finishing.

The two types of clay are mixed together in equal parts. Mixing is needed, it was explained, because of the scarcity of the fine clay. The finer clay is also deeper, and thus likely harder to obtain, but workability of the resulting clay may be another factor. The dry clay is then ground with a stone rocker mill (*tunaw* and *maran*) until fine (fig. 21). The ground, untempered clay (*allpa kuta*) is then screened through a larger, rectangular sieve (figs. 20-21); poorly-screened clay can cause white-colored spalling.

The *aqo* is then mixed with the clay in estimated proportions of about two parts clay to one part *aqo*. The standards of measure are the *puruña*, the Spanish *arroba* (25 lbs.), and the amount contained on the hide used for kneading the clay: one *puruña* = one *arroba*, and two *puruña*s full of mixed clay = one hide full. To make a *hatun raki*, two *puruña*s full of mixed clay are mixed with one *puruña* of *aqo*. Amounts may be increased or reduced proportionally.

The prepared clay and water are mixed by hand and then left in piles on the *maran* for one day, in order to soak the clay thoroughly (*chullurusqa*). Hand mixing does not fully wet the clay, but letting it stand allows water to penetrate by capillary action so that there are no dry lumps.

The clay is kneaded with the feet on a cowhide for about 15-20 minutes (fig. 22). The cowhide is first well sprinkled with water, using a piece of woolly sheep skin. Using bare feet, especially the heels, the person doing the kneading slides from side to side, checking the clay by hand from time to time to see that it is well mixed, until the clay is smooth (*llamp'u*), and "the person sweats." If the mixing is not thorough, the vessel will crack when fired. The cowhide will last about four years before it is worn through. The same clay preparation process is used for all vessel forms.

Processes of manufacturing pottery

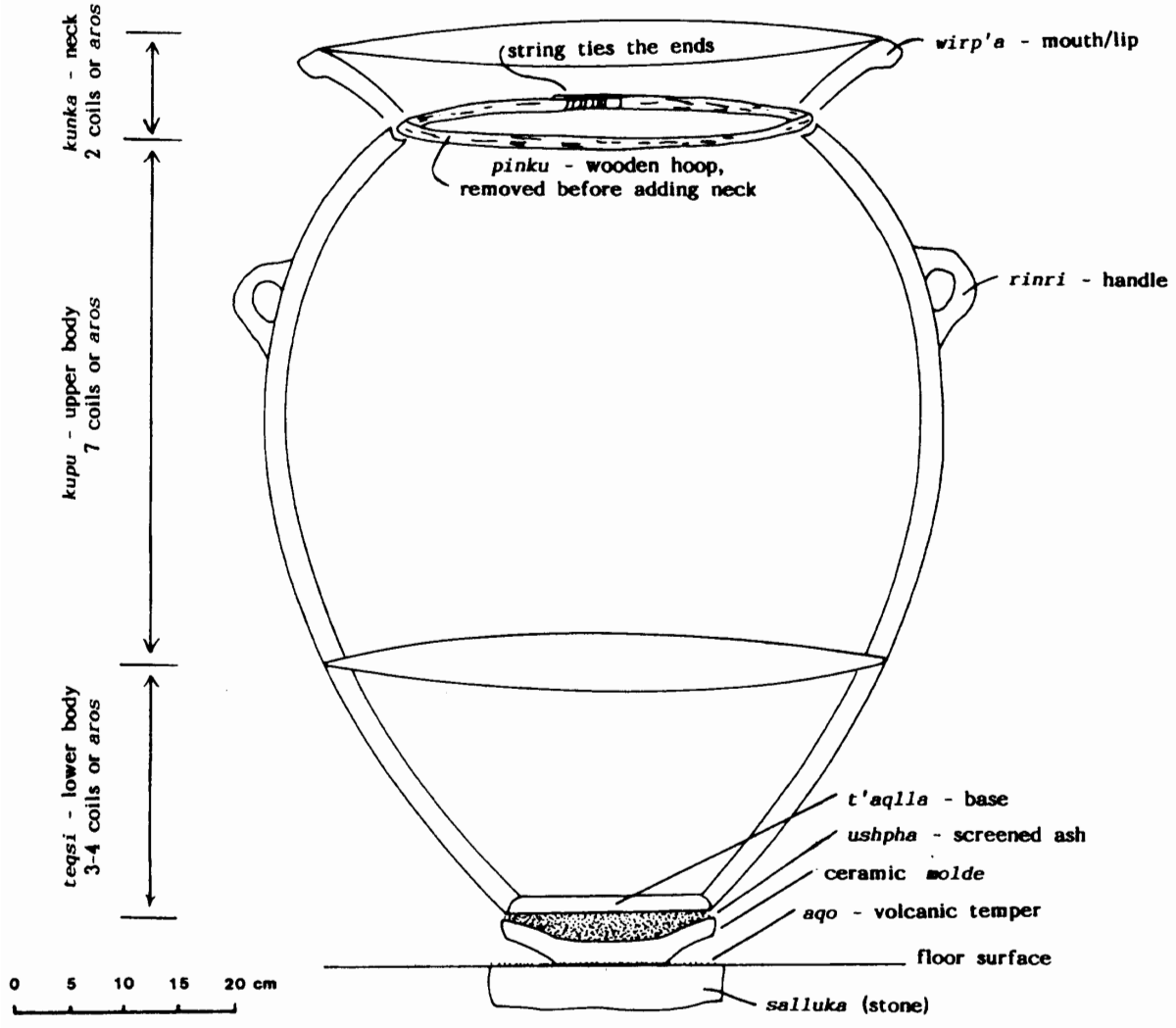
The Appendix details the steps followed in the manufacture of both coil-built and press-molded forms, including native terms for vessel parts, tools, equipment, and processes involved. Some general observations may be made here, however.

Diag. 1 shows *raki* construction and diag. 2 *puruña* manufacture. The bases of all coil-built forms are flat, and of all press-molded ones convex. Dimensions of some coil-built vessels are determined by natural measures (e.g., hand span), and portions of the vessels are named for human body parts (diag. 1 and Appendix). Coiling does not involve the spiraling of a single roll of clay, but rather the placement of successive, separate, ring-shaped coils (*arus*) (fig. 38). The construction of a *raki* involves making a flat base upon which is built a globular body consisting of the lower portion (*teqsi*) of 3-4 coils, and an upper portion (*kupu*) of 7 coils to which the handles and neck (2 coils) are added in that order. Interior rather than exterior finishing of the body is of primary concern until the *kupu* is completed. The vessel, supported on its *molde*, is rotated only until two of the *kupu* coils have been added; after that, the vessel remains stationary, and the potter walks around it. Exterior finishing involves four processes, each having the same name as the tool used in that process. After the completed *kupu* has partially dried, the first three of these processes are carried out. Handles and neck are then added, and the vessel is dried again; the last exterior smoothing is followed by a final drying. Slipping, painting, and firing complete the vessel.

Tools vary in form, material, and manufacture primarily depending on the

Diagram 1

Raki Construction: Key to Parts and Materials

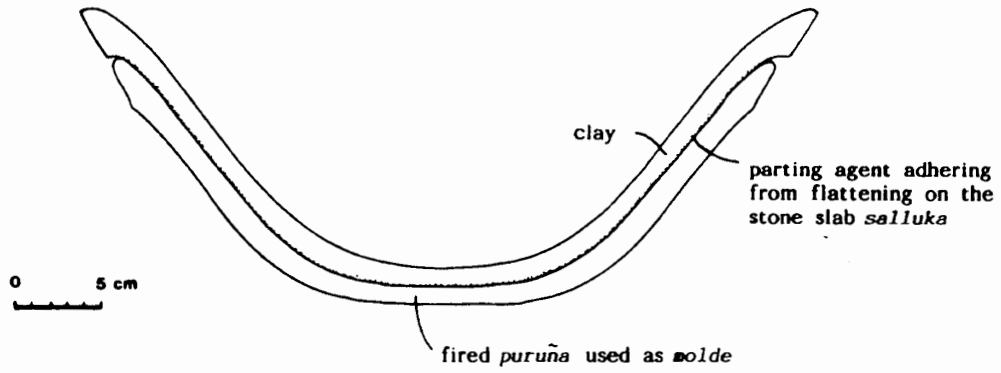


part of the vessel on which they were used, whether interior or exterior, and on the degree of finishing they produce. The flat base is formed using a *t'aqllana* (fig. 23), chipped into its circular form from a naturally flat, sedimentary stone from the river. Interior finishing is done with triangular *chawinas*, ground to shape from porous volcanic rock; their shape varies depending on whether they are used on the *teqsi* or the *kupu* (figs. 24-26). To finish the exterior, first a metal *k'isuna* (fig. 27) is used for scraping, and then a *qaruna* (figs. 28, 29), ground from porous volcanic stone (probably scoria) to a different shape from the *chawinas*, is used for initial smoothing. The final smoothing is done with *llamp'uñas* and *llunk'unas* (figs. 30-32) of various forms, but all with one very smooth edge, and made of hard, fine-grained rock or even glass to achieve the desired fine finish.

While the interior of *puruñas*, *chillakus*, and *pukus* is smoothed, the exterior has a rough and porous texture resulting from the adhering parting agent used on the *salluka*. The exterior contour, however, is very even because the clay is pressed into the mold. The vessels are the same size and shape as their molds, including exterior lip thickening, because the vessel rims project above the rims

Diagram 2

***Puruña* Construction**



of the molds (see diag. 2).

The term *molde*, it may be noted, is used for both the ceramic turntable disks and the round-bottomed vessels used as molds. Both forms are rotated on the *salluka*. In 1954, Qeya potters making bowls were using specially-made, bowl-shaped *moldes* with thicker walls than bowls to resist wear from rotation on the *salluka*. (J.H. Rowe, pers. comm., June 1985). Steps 1-2 (see Appendix) are essentially the same for both coil-built and press-molded forms. Likewise, both forms are rotated in the same direction: counterclockwise in step 2, clockwise in later steps. However, the *chawina* is used pointing downward for the *teqsi* of the *raki*, while for the *p'uku* it points upward.

Decoration

Three kinds of mineral colorants are used, as indicated in the Appendix. Red earth (*taqu*) for red comes from Yauri, capital of the province of Espinar. The white earth (*chaqu*), which is white in color before and after firing, is dug from the ground locally. Black pigment (*chinchi*) comes from a stone called *qellka*, which people find locally while cultivating. It is burned in an oven, then ground, and prepared like ink with water.

Camino told us that the designs have always been as they are now (e.g., bands, crosses, circles, single wavy lines). Everyone employs the same designs, even potters in Qeya; each family does not have its own. Litto (1976, pp. 23-31) documents very similar decoration used by Machaqmarka potters, and suggests that rosettes, fillets, and delicate painted lines are imitations of Pucara or Checca Pupuja decorative techniques.

Appliqué decoration is also used, although apparently less frequently than paint. A punctate fillet (*chumpi*) may be applied below the neck of *tumin*s or *mak'a*s. A round appliqué rosette (*ana*) having two incisions forming a cross, may be placed on the top of each handle, and two or four on the top of the rim of *mak'a*s and *urpu*s (or below the rim of flower pots).

Firing

Litto (1976, pp. 25-27) provides photographs and a description of firing in

nearby Machaqmarka. Although we never observed firing, the process appears to be virtually identical, according to our interviews.

Most families fire on the ground in the open patio of their house. In the patio of Camino's house there was a circular area of burnt orange soil, 3.1-3.5 m. in diameter, left from the firing process. Martín Rodríguez fires in his small animal corral, where the fuel is stored, since the patio of his house is too small. Roof tiles, no longer made, were fired in the same manner as pottery.

Families in the community who make pottery for the annual August 15 fairs make complete inventories of forms for firing between August 2-5. For proper
B stacking and firing, all forms must be present in a given proportion of large to small vessels. Although single forms are never fired separately, Camino pointed out that small quantities that do not include all forms or make complete inventories can be fired. That is, in the rainy season, when the three largest forms (*hatuchaq*) are not made, others (*khulla*) can be produced and fired in small amounts, but evidently with a range of forms included, from *mak'a* to *p'uku*. A large firing requires 4-5 hours, while a small one takes only about 2 hours. In a 5 hour firing, 20 *raki*s, 30 *tumin*s, 100 *puruña*s, and 200 *p'uku*s can be fired. The amount of cow or burro dung needed for five hours of firing would perhaps measure 2 × 1.5 × 1 m.

Dung is the major fuel used, together with grass, and firewood may be used as specified below. Cow and burro dung are called *waka k'awa* and *asnu k'awa* respectively, while sheep dung is *ucha* and llama dung is *taqya*. Pulverized dung of any kind is *wanu*. *Kulcha* is sheep dung that, in the corral has been stamped to powder and mixed with enough water to permit shaping it into clods or chunks (*k'urpa*s). Just a small amount of *kulcha* is used in firing because sheep dung produces too much heat, and can crack the pots. Burro dung produces less heat and is better. People know the approximate proportions of *k'awa* and *kulcha* for firing. Llama dung may also be used, but the people of Raqch'i do not have llamas. Pure *taqya* cannot be used for firing, but pure *k'awa* can. Some people do not have sheep, so they buy llama dung.

Steps in the firing process include the following:

1. The circular firing area is covered with dung to a depth of 30 cm.
2. *Raki*s are positioned near the center, on top of sherds (*k'arpa*s) on the ground, mouth up.
3. *Tumin*s are placed around the *raki*s and on top of the fuel, also mouth up. Fuel surrounds the *tumin*s and other vessels.
4. Small vessels are added last, on top of the other vessels. *Raki*s and *tumin*s have their mouths partially covered by *puruña*s followed by *p'uku*s. A *puruña*, for example, is placed base up, and tilted so that it partially covers the mouth of a *raki*.
5. A circular wall of stones or adobes about 30-50 cm. high is built around the heap of vessels and dung, about 20 cm. away from it.
6. In the space between the wall and the vessels, additional dung is added to the height of the wall. When there is not enough dung, firewood (*llant'a*) such as eucalyptus or *capulí*, which is better, may be used. The firewood produces the same results as the dung, but is scarcer.
7. The entire mound is covered with a calculated amount of grass. Grasses used are *paja brava* or *iru*, which is like *paja brava*, and grows around the volcano.

8. Finally, dry burro or cow dung (pulverized cow dung, *waka wanu*, is better) is placed on top of everything.
9. Portions of the wall are then removed to make holes all around through which the fire may be ignited.
10. To start the fire a pile of dung is ignited outside the wall. When it burns red, like coals (*sansa*), it is scooped up in a *puruña* from which the red hot coals are pushed with a stick into the prepared holes in the wall all the way around.

Salt is used in firing at two points: (1) it is scattered on the bottom of the empty firing area "*para que agarre la calor*," to have the heat/fire take hold or to have the fire well ignited; (2) it is thrown on top of the mound for more heat and fire. The overall purpose of the salt is to fire well ("*quemar bien*"). Litto, whose Machaqmarka informant said salt "made it better" (1976, p. 26), interprets its use as ritual; it explodes in the fire. The use of salt needs clarification.

During firing, burning should occur only in the interior, and flames (*qallu*) should not be visible, since if they are, heat is lost and pots do not fire well. If flames show, they are covered with grass, pulverized dung, and broken pots (*k'analla*). The fire is extremely smoky. Firing is completed when all the fuel is consumed. Vessels are cooled for the same number of hours as they were fired and then removed.

People in the community believe that bad luck in firing will occur if nonfamily members watch. Consequently, only the family can enter the house during firing, and the door or entryway into the patio is closed very securely. A curtain may be placed over the door so that no one, not even neighbors, can see or come in. Family members will tell friends in the village that they are firing, so that people not supposed to be there will know to stay away. In addition, firing may be carried out at night to avoid people looking in. No offering is made for success in firing.

Location of raw materials

The distances involved in obtaining clay, temper, and colorants fall within the preferred ranges for these materials found by Arnold (1981, pp. 34-37; 1985, pp. 35-60). Raqch'i potters obtain their clay from about 3 km. away and temper from within 1-2 km. Machaqmarka and Q'eya share this resource territory, at least for clay and temper, encompassing the area within and around the 5 km. between Machaqmarka and Q'eya. While materials for white and black paint are local, that used for red paint comes from the province of Espinar, perhaps 70 km. away. Specifically, people from Yauri bring *taqu* for red paint to exchange only for maize and other vegetables, or to sell. Furthermore, a generation ago, people from the province of Chumbivilcas apparently brought to Raqch'i the especially durable rocks (possibly quartz) used as polishers (*llamp'unas*). Finally, llama dung is sometimes purchased, and brought back by burro, from the punas, such as Pirurumi near K'uchu'uma.

Quantity produced

A potter can completely finish two *rakis* per day (except for the final drying) if there is someone to help him. In July 1973 we observed that Martín Rodríguez had 7 *rakis* finished inside his house and 3 outside, 2 *rakis* and 3 *teqsis* (lower portions) in process. Leonarda Camino made 33 *p'ukus* in one day (1974), and

could have produced more, but had used up all the clay. In one month alone, she produced 40 *puruñas*, 60 *chillakus*, and 100 *p'ukus*. One can observe the number of vessels made by Nicasio Mamani and family in figs. 40 and, especially, 46, including approximately 4 *rakis*, 10 *mak'as*, 10 *tumins*, 10 *lavadores*, 1 *puruña* (at least 12 more were outside drying), and 30 *p'ukus*.

Vessel life

The life span of vessels depends, of course, on whether they are well cared for. We were told that *rakis* and *tumins* last for about two years; the vessels crack and bases get holes in them. *Puruñas* will last for about two years when well cared for, while *p'ukus* tend to last more than two years. *Moldes* last at most ten years in good use.

Use of Pottery Fragments

Sherds from broken pots were observed to be used in at least five ways. A sherd from a *raki* can be used as a *qaruna* in place of the stone tool. *Rakis* are placed on top of sherds on the ground during firing, and sherds are used to cover the mound if flames appear. Children make round sherds, about 5-7 cm. in diameter, for playing a game; and large fragments are placed along the ridgepole of thatched roofs. Fragments are also used to tilt up ollas on the earthen stoves so that oxygen can reach the fire. In addition, sherds (even prehistoric ones) or tile fragments are used between adobes to level them during construction (Edwin Chávez, pers. comm., 1983).

Consumer Notes[5]

In selecting a vessel to buy at a market, several qualities are considered. While the form and decoration of pottery indicate where it is produced, the decoration is not important *per se* in the selection of pots; one can buy pots from different locations, since they need not match. The quality of firing is the most important factor in selecting vessels in the market, and can be evaluated by vessel color. A well-fired vessel is red, while a poorly-fired one (*hanku*, or uncooked) is "white"; although the color cannot be observed on completely glazed pieces, these are always well-fired in any case. To test for cracking, which may not be apparent visually, the vessel can be struck; it will ring if uncracked. Potters can detect cracks in vessels by filling them with water. Once cracked, the vessel cannot be repaired and must be thrown away. A *raki* must be well-fired and uncracked, otherwise pouring boiling *chicha* into it could cause it to break. Furthermore, when the temper of an olla is not fine, cooking can cause the pot to crack.

Vessels must be stable, with an even base so that they stand straight. The size of the olla and diameter of the mouth are important considerations as they relate to function. Large ollas are used for making soup; medium-sized for rice; and small ones for chocolate, *mate* (herb tea), milk, and to set soup aside for later consumption. A wide-mouthed, medium-sized olla can be used to make *chicharrones* (crisp-fried pork), rice, *adobo* (a stewed pork dish), and other main-course dishes. The smallest-sized ollas can be used to store lard, *ají colorado* (which does not spoil in an olla), money, and as ornaments.

Once a vessel is obtained, the consumer must further process it before it is used. Without the curing process, it is thought that vessels, especially ollas, would last only a matter of days, since they would rapidly break or crack. *Chicha* jars and even plates are also cured, but storage vessels do not have to be.

A curing process, applied to vessel exteriors, involves two steps (compare the varnishing process in Linné (1925, pp. 148-151): (1) *parisqa*, the vessel is heated, mouth down, over a fire made on the ground; (2) *arisqa*, a hot mixture is painted onto the exterior of the hot pot. The mixture consists of *chuño* and a dark molasses. The *chuño* is ground (about two handfuls for one olla), water added to reach a soupy consistency, boiled, and mixed with the molasses, which dissolves, producing a consistency like thick glue. A wooden spoon is used to apply the hot mixture, which dissolves on the hot vessel exterior. The mixture must dry well, until the following day, to penetrate the pores. Alternatively, the hot vessel may have grease or fresh beef spleen, lung, pancreas, or meat applied to its exterior, or it may be painted with *sut'uchi* (coarse maize sediment, a by-product of *chicha* making, usually used to feed guinea pigs) (Gertrudis García de Aguilar, Cuzco resident, pers. comm., January 1983). Vessels apparently may also be painted on their exteriors without being heated first. The hot mixture dries rapidly in the sun, and a second coat is applied.

This curing process produces a black, shiny, varnishlike surface once the olla is used. The outside of glazed ollas are not usually cured, although they can be. In Raqch'i no such processing is practiced, not even for ollas obtained from elsewhere, and Camino was unaware of this *parisqa/arisqa* process. That some consumers perceive it necessary to cure vessels while others do not suggests the process is not strictly necessary. If not, then why is it done? Such coating does reduce permeability, and may lengthen vessel life, though the latter remains to be proved. It is possible that such curing is related to distance from or availability of replacement vessels. Testing of cured and uncured vessels could resolve these questions.

In addition to curing the exterior, a second process, cleaning the interior, must be performed on all vessels, including those that have not been cured. A few days after curing, boiling water is poured into the vessel, and left for ten minutes or until the water cools; after rinsing with other water, the vessel can then be used. This process assures that food will not have a ceramic taste or smell. Even glazed pots must be treated with boiling water.

Just before using a *raki* for the first time for *chicha*, users in Raqch'i fill them halfway up the body with water (not boiling); for ollas they swish cold water around the interior, and empty it out. Camino had heard that, in *chicherías*, hot water with *sut'uchi* is painted on the inside of jars.

A ceramic vessel may also be bound (*seq'osqa*) to avoid breakage. For vessels like *rakis*, cowhide strips are soaked, then bound net fashion around the body of the vessel up to its neck. As the hide dries, it tightens. Placing a leather strap around the neck of an olla also prevents cracking.

Ceramic Variability

Procurement of clay and temper, as well as clay mixing, are unskilled tasks carried out in essentially the same manner by the entire community. Likewise,

everyone uses the same designs, as noted above.

Individual differences do occur in attributes of form, however, resulting from minor variations in family pottery production. Such individual differences permit people to recognize the pottery made by others. Camino used the analogy of writing in this regard; people use the same letters to form the same words, but each individual's handwriting differs. At the same time, Camino talked about variability in terms of family differences. When a man and woman marry and establish a new household, the woman continues to make the female forms learned from her mother, as does her husband the male forms learned from his father, and they can each recognize the pottery made by their families of birth. The new family, with its children, however, create a set of all forms having a combination of individual variations different from that of any other family.

Furthermore, Camino implied that more variability can be observed in *rakis* (and other coil-made, male-produced vessels) than in *puruñas* (and other press-molded, female-produced vessels), a logical observation considering the differences in production techniques of each, although women may not agree. There is less room for variation in the molded vessels, since they essentially repeat the mold form, while each coil-built piece is built up by hand. Camino noted that the characteristics of Martín Rodríguez's vessels were the pretty handle and neck. One may also compare the *rakis* made by Rodríguez, shown in fig. 39, with those made by Nicasio Mamani, shown in fig. 40.

According to Camino, differences in shape attributes for *rakis* or other large, coil-made vessels include the following (especially the first two):

1. Some handles are of uniform width, some taper; their placement may be higher or lower on the body.
2. Neck diameter and height vary.
3. The contour of the *kupu* varies according to the location of the greatest diameter.
4. The thickness of body walls varies, in turn affecting total weight.
5. Diameters vary.

While everyone paints *rakis* with red, only some paint *tumins* and *puruñas* with white, red, or black. Some people paint small vessels with white. No maker's marks or other identifying symbols were observed on Raqch'i ceramics except the *moldes* (fig. 18), as noted above.

The Social Organization of Pottery Production and Intravillage Distribution

That the primary unit of pottery production is the family, residing neolocally, is indicated by the following points:

1. The complementarity of vessel forms that exists is based on a division of labor by sex.
2. Pottery making is learned in a family context.
3. Individual differences in pottery are expressed as primarily family differences.
4. Assistance in production is provided by family members.
5. Only family members may be present during firing.

Distribution, on the other hand, may be carried out by nonfamily members.

There is a sexual division of labor which, according to Camino, is based on vessel size; men make all the large vessels while women make the smaller ones (Table 1). This division also tends to correspond to the two different techniques employed. Men and women both make pitchers, however, and some exceptions exist, which are discussed below. The division is not uniform for all three communities (Table 1), although the general size division seems to hold. In Machaqmarka, "Making pottery is mainly the work of men, although many of the women, too, do make pottery" (Litto, 1976, p. 25). In one family, only the father made ceramics, "as his children were very small and his wife did not do it" (Litto, 1976, p. 27). Litto does not illustrate any of the vessel forms typically produced by females in Raqch'i possibly because, of these, only *p'ukus* are made in Machaqmarka. She does not specify what forms are made by each sex. Furthermore, she reports that even small bowls are formed on the turntable disks (Litto, 1976, pp. 29, 30 lower photo) in contrast to Raqch'i practice.

To increase income, because of the recently worsened economic situation, some women in Raqch'i began making male forms around 1982-83, including all those listed in Table 1, even *rakis*. Although Camino has not directly observed this production, he has heard that there are two to three women who make male forms very well. Similarly, men are now making at least two of the traditionally female forms, *puruñas* and *chillakus*. Camino stated that when he was young, about 50 years ago, the forms made by men were kept more clearly separate from those made by women. These recent changes confirm that, although the organization of production based on the complementarity of male-female forms is traditional; economic necessity can bring about innovations.

The 1936 painting by Angel Rozas of ceramic production near Raqch'i (fig. 2) shows women finishing (and perhaps manufacturing?) large *tumins* while men are finishing huge *qocha urpus*, a form no longer made. If manufacture rather than finishing of these two forms by women and men, respectively, was intended to be represented, however, and assuming the painting is accurate, then considerable change has occurred in Raqch'i even before the current economic crisis (unless perhaps Machaqmarka was meant to be represented, where a different division of labor may have occurred). The male-female dichotomy of forms based on technique would then not hold, while one based on size would. Other female forms, like *p'ukus* or *puruñas*, are missing from the painting.

Camino, at least, seems to view change in the male-female dichotomy as difficult. In 1973 when he was asked about the possibility of women making *rakis*, he emphatically declared that Raqch'i women would not be able to make *hatun rakis*. He stated that women have trouble using the *kupu chawina*, the tool used on the upper interior surface, that they do not know how to calculate or to control it resulting in an ugly surface. It is not just a question of force, then, although force is needed, but rather of calculating thinning evenly. Women finish *mak'as* and *tumins*, however, so it is not clear why they could not make *hatun rakis*. Although men make the larger vessels, women may complete the arduous task of clay preparation and directly assist in the process of making the large vessels. The grinding, mixing, and kneading of the clay were observed to be carried out by one male potter's wife (fig. 21). While interviewing and observing her husband making a large vessel, we saw her carry out the following tasks: bring drying *teqsis* inside out of the sun, collect *k'isuna* scrapings to add to new clay, and polish a *raki*. However, men also knead clay, and only some women do. This potter's wife did so because she "was still young and still helped her husband a great deal." After a year or so of marriage, women have babies and no longer

Table 1

Forms Produced by Male and Female Potters in Raqch'i, Q'eya, and Machaqmarka

	Vessel Form	Raqch'i[a]		Q'eya[b]		Machaqmarka[c]	
	Coil-built	male	female	male	female	male	female
Largest (*hatuchaq*)	*raki*	x		x			
	urpu	x		x			
	small *raki*	x		?		x	
Smallest (*khullu*)	*mak'a*	x		x		x	
	tumin	x		x	x	x	x
	kamaña	x			x	x	x
	chamaka	x			x		x
	aysana	x	x		x		x
	lavador	x		x	x	x	x
	wich'i	x			x		x
	Press-molded						
	puruña		x		x		
	chillaku		x		x		
	p'uku		x		x		x

[a]Based only on information provided by Camino in 1971, not including the changes he mentioned occurring about 1982-83 (see p. 176). In 1973 he said that some women make *tumin*s and some men make *puruña*s.

[b]According to Camino, 1985; in 1973 he said that all forms were made in Q'eya. In 1954 John H. Rowe (pers. comm., 1986) recorded that men made *raki*s, *mak'a*s, and *p'uynu*s (small jars) as well as *tumin*s and *urpu*s; women made *puruña*s and *p'uku*s as well as *harrachas* (small pitchers), although he saw a woman making *mak'a*s.

[c]According to Camino, 1985; in 1973 he said men make only *mak'a*s and *tumin*s. Litto (1976, pp. 26, 30-31) illustrates at least the following forms made in Machaqmarka: small *raki*s, *mak'a*s, *tumin*s, pitchers, *lavadores*, *wich'i*s, and forms that look like *kamaña*s.

have the time for such tasks, it was stated.

Marriage may be viewed as the creation of a new pottery-producing unit, since the forms each spouse knows how to make complement those of the other. It may be that the ages at which young people begin to make pottery independently (15 for girls, 18 for boys), as indicated by Camino, correspond to their ages at or near marriage. Camino's daughter Leonarda, however, had been producing her own pots for about seven years before she married. Upon marriage, each spouse will make pottery according to the way he/she learned it in his/her own

family. Because men make certain forms and women others, no relearning is necessary after marriage, so this division of forms by sex eliminates potential conflicts as a husband and wife complement one another. Furthermore, because procurement of materials and mixing them for clay preparation are carried out the same throughout the community, these steps do not require relearning either.

Before a married couple has children who can assist them, the process of making pottery is slow and production is low. Families with young children, on the other hand, can produce ceramics faster. Quite young children can bring clay and temper, and older ones can prepare materials for the potter. Pottery making is learned by children in the family as they first observe and assist in these unskilled tasks (e.g., fig. 34; Panyella, 1981, fig. 722). An 18 year old boy can make pottery alone, and can help make it before that, learning from his father. Some men make pottery as early as age 13, and precocity in the craft is regarded as a mark of intelligence. Women learn the skill from their mothers. Leonarda had been making pottery since she was 15. Family differences in pottery can be understood, then, as the learning of ceramic production occurs in the family setting, including the transmission of variations to children as part of that process.

Continued residence in Raqch'i, rather than birth alone, appears to be a determining factor in maintaining specialization within the village. For example, about 1977 Leonarda married a man from nearby San Pedro, where she now lives. She no longer makes pottery because people in San Pedro do not do so; and, since one form cannot be fired alone, she does not make pottery on her own. Neither does she make pottery at her father's house in Raqch'i when she visits there. Immigration to Raqch'i by nonpotters provides a pool for recruitment of additional pottery producers. For example, if a man marries a woman from Raqch'i, resides there, and has no job he may then learn to prepare clay and/or gradually learn pottery making. Others will never learn, however, because of the difficulty and the degree of individual commitment required. Neither does residence guarantee that all will become potters. The current younger generation helps, but shows little interest (1973). Camino's youngest son, Sixto, for example, only assists in bringing clay and temper, and does not make pottery, but may yet learn. He is married to a woman from Raqch'i who makes pottery, but he is currently working for the Instituto Nacional de Cultura reconstructing the Raqch'i church, and is going to school. Sixto's inability to make pottery may relate to the fact that his father was no longer making pottery when Sixto was growing up.

Ceramic production in Raqch'i, then, is divided into the skilled tasks of pottery construction and the unskilled tasks involved in preparation and general assistance. This organization of production takes advantage of individuals who are just learning pottery making or who are not skilled in the construction of certain forms, by assigning them the vital unskilled tasks like clay and temper procurement and preparation. As seen in the preceding examples, the unskilled division includes young children, older novices, new residents, and women or men who may perform these tasks for their spouses.

A family should produce an adequate number of all vessel forms because, according to Camino, a certain proportion of all forms is needed for proper stacking and firing. In addition, a complete repertoire would, it seems to me, be advantageous for exchange or sale outside the community. The full complement of forms is theoretically obtainable when male and female members of the family are able to produce them, especially assisted by children. However, when a family cannot achieve a proper balance or number of forms, there are two remedies:

First, men can make female vessels, or women can make some male forms. Some women make *tumins*, while some men make *puruñas*. Men producing *puruñas* in 1973 did so only because, (a) there were no children to assist the two spouses in manufacturing pottery, and (b) they knew "by chance" how to make *puruñas* (some men do not).

Second, a family may obtain needed vessels from relatives or friends through a form of intravillage distribution made possible by the traditional institution of *mink'a*, used here in the general sense of recruiting extrahousehold labor for a given task at a given time. *Sañu mink'a* is the term applied to the labor obtained for pottery making. Specific arrangements of payment for such labor vary, and may include goods, like food (*mikhuna*), cash (*qolqe*), or equivalent reciprocal labor (*ayni*).

In Raqch'i, if potter A needs to complete the ceramic inventory, he or she will first determine who can make the needed vessel form and who can produce a surplus of unfired vessels to dispose of or share; but consideration is also given to who produces the best ceramics. Once the potential supplier (potter B) has been identified, potter A solicits potter B's labor for pottery making, imploring the individual to help, and payment is agreed upon (food, money, or reciprocal labor). Potter A, however, must furnish all materials to potter B, including prepared clay and temper, and may also provide daily expenses in grass, dung, food, or cash. Potter B will make the vessels in his/her own house and bring them unfired, even the large *rakis*, to potter A's house for firing, over distances as short as between neighbors or as long as several blocks. *Mink'a* transactions may be made with anyone, including friends and relatives, and Camino indicated that the process worked the same way in the "olden days."

An example will illustrate this system of intravillage distribution. Camino no longer has time to make pottery because he is the caretaker of the archaeological area of Raqch'i, and more recently ticket taker as well. His wife cannot make pottery because she has arthritis. Consequently, they obtain a complete repertoire of needed vessels from others. In 1974, his nephew Martín provided three *rakis* and another nephew four *tumins*; in addition, a goddaughter made *puruñas*, supplementing those his daughter Leonarda made. In turn, Leonarda made *p'ukus* for for Martín and the other nephew. Although all these individuals are his real or fictive kin, Camino assured us that these relationships were not the basis for the exchange. Martín needed *p'ukus* and identified Leonarda as the potential person to make them. After they agreed, Martín prepared the clay and brought the necessary materials to Leonarda's house where she made them. Leonarda then took the unfired *p'ukus* to Martín's house. In return for her labor, Martín made *rakis* from the prepared clay she provided him and brought them unfired to her house. The transaction was thus cancelled in *ayni*, reciprocal labor. Alternatively, Martín could have repaid by helping in the agricultural fields, involving a different kind of labor. From Leonarda's point of view, she reciprocated in labor for Martín's *raki* production. The labor, food, or money exchanged for pottery-making labor results in the intravillage distribution of unfired pots to complement the set a family needs for firing and external distribution.

In summary, the firing technology that requires a number of diverse forms to be fired together rather than separately appears artificially maintained (other firing options could be devised), and such a technological requirement creates and maintains an interdependency of the male and female producers. When a full complement of forms cannot be achieved within the family unit of production,

this technological requirement creates and maintains an intravillage interdependency, achieved and made possible by the institution of *mink'a*. Family or intravillage interdependency are, of course, needed in other areas of production and resource distribution aside from ceramics.

Scheduling of Pottery Production

Most people make pottery seasonally to exchange for food during various annual fairs that occur on August 15 in celebration of the Assumption of the Virgin. People who have time will make pottery in small quantities all year round, even in January or February, during the rainy, growing season. The largest vessels (*hatuchaq*), including the *raki*, *urpu*, and small *raki*, are made only in time for the fairs, while the other forms can be made any time during the year. Dry climatic conditions may be more critical for the production of the largest forms, as noted by Arnold (1985, p. 70).

Generally, pottery production takes place during the colder, dry season, after harvest time and before planting, from at least July to the end of August; some people, for example, were beginning to make pottery around July 9, 1971, during our visit. People like Martín Rodríguez make pottery only or mostly for fairs, planting and cultivating during the rest of the year. Pottery making during the dry season does not conflict with agricultural activities, while taking advantage of the sun and lack of rain, conditions most propitious for drying and firing pottery. Others have noted the correspondence between ceramic production and variables of climate, the agricultural cycle, and the economic/ritual cycle of fairs (e.g., Valcárcel, 1946; Arnold, 1985, pp. 66-108; ms.). Annual fairs held during the dry season, precisely when agricultural products are readily available to exchange for pottery, provide the "significant redistributive mechanisms" (Arnold, ms., p. 5) whereby pottery and other products can be exchanged. Furthermore, as Arnold has noted, the dry season is the best time for travel, when routes are open and people are free from most agricultural obligations.

External Distribution of Raqch'i Ceramics, Acquisition of Nonlocal Pottery, and Exchange

Pottery production today is primarily a part-time activity, inextricably linked with agricultural production. In order to supplement the low agricultural yield of the area, ceramics are bartered or exchanged directly and exclusively for certain kinds of food, or are sold for money. They are not exchanged for clothes, textiles, animal products, or other pottery. Camino stated explicitly that the amount of food people produce does not last all year, and that they would not have to make pottery if they had enough agricultural produce.

Factors he identified as limiting agricultural productivity include the small size of fields or parcels of land, which are divided among children each generation, and the abundance of volcanic rock. Furthermore, some fields flood during the rainy season. Some people have more land than others, but when asked whether those who make pottery all year round were those with less land, Camino responded negatively. The presence of extensive archaeological remains further limits arable land in the vicinity, as do cultivation restrictions imposed as conservation measures since the creation of the National Archaeological Park in 1969. Finally, irrigation is not utilized, leading to agricultural marginality by restricting maize

cultivation and limiting production to one crop per year (Arnold, 1985, pp. 180-183).

There are three major means by which ceramics are distributed externally: during annual fairs away from Raqch'i, at distant periodic markets, and on an individual basis locally. Producers exchange pottery for food or sell it for cash depending on the wishes of either distant or local consumers. Cash sales occur in the city markets, like Sicuani and Cuzco, as well as through middlepersons in Cuzco.

Annual fairs

On August 15, there are annual fairs in T'iobamba near Cuzco, in Calca, in Oropesa, and in Cusipata, and some Raqch'i potters take their ceramics to each of them. For many potters, like Martín Rodríguez, who make ceramics primarily for annual fairs, fairs provide the major distributive mechanism. Arnold (ms., p. 5) saw boxcars full of pottery from Raqch'i and Pucara being unloaded at the Cuzco-Puno railroad station between August 12-14, 1972, to be transported to the T'iobamba fair by truck. Valcárcel (1946, p. 480) notes that, "The Tiobamba fair sets the price of maize for southern Perú." Valencia Espinoza (1979, p. 189) indicates that people from Puno and from Raqch'i who sell or exchange ceramics during the Oropesa fair have specific locations there in which to do so. Camino said that at large distant fairs like Urcos in February, T'iobamba, and Calca each village has a designated site, but in nearby locations like Sicuani, Tinta, and Combapata, people from the three San Pedro-Tinta pottery-making communities are mixed.

People from Canas come to the annual Tinta fair on August 24 (San Bartolomé) to exchange their products (e.g., camelid fiber, *ch'uñu*, *muraya*, *qañiwa*, and ceremonial/medicinal plants) for those of lower elevations in the Vilcanota River Valley. Among the products they obtain are ceramics from Pucara and Raqch'i (Valencia Espinoza, 1979, p. 187). Families from Raqch'i, Q'eya, and Machaqmarka may take their pottery to this fair. There may be other fairs to which Raqch'i potters take their products. Despite the proximity of the Tinta-San Pedro communities to Cuzco, they do not sell their pottery there at the festival of Santurantikuy (December 24), although potters from Puno and even Ayacucho do so (Cátedra de Folklore, 1966, p. 140; personal observations, 1982, 1984, 1985).

Markets

There is a weekly Sunday market at Pampacuchu in Sicuani where pottery is sold for cash. Raqch'i potters apparently do not distribute their pottery at this fair, presumably because it would conflict with other fairs farther away where they could obtain more diverse agricultural products, while the Pampacucho center is available to them throughout the year. In Sicuani, people buy *tumin*s, *puruña*s, *p'uku*s, and only some *raki*s. Consumers come to Sicuani from Maranganí and other locations to the south, including Pucara. In 1971 and 1973, Camino told us that Sicuani was the southernmost point to which Raqch'i residents take their pottery; in 1974, however, he said that Maranganí was the southernmost. He noted that they almost never take pottery to Pucara, but speculated that the Pucara people might buy it if they did so.

In the city of Cuzco, there is a daily market in which pottery may be sold, either directly or through middlepersons in Cuzco, who then charge slightly more for the vessels in the market (in 1973 the difference was 20-30 *soles*, when the *sol* was $.0235). Only in Cuzco are middlepersons used; elsewhere pottery is

sold or exchanged by the potters themselves. The middlepersons, who are mestizos, need not be real or fictive kin, but are friends of the potters. They pay cash for all the pottery the Raqch'i producers bring. Raqch'i producers who sell their pottery themselves stay in Cuzco for about a week. In contrast to the sales in the Sicuani market, those in Cuzco especially include *rakis*. Moreover, there are tourists in Cuzco who purchase imitation Inca forms made in Raqch'i, and hotels that buy some forms, like *rakis* for planters, and *p'ukus* for ashtrays.

Litto (1976, p. 27) observed that most pottery produced in Machaqmarka, "was sold to the truckers who buy up work from various communities and sell it in lots to the market vendors." She also notes that some women ride in the trucks with their pottery to market, "to supervise its sale." In Raqch'i, however, potters do not sell their pottery to truckers (1985).

Raqch'i potters take their ceramics to exchange at other distant markets, generally weekly, or perhaps at annual fairs including, from north to south, Ollantaytambo (the farthest north as of 1974),[6] Urubamba and Calca, Chinchero, Paucartambo (considered to be the easternmost limit in 1973-74), Paruro and Accha (westernmost limits in 1973-74), and Acomayo. The Raqch'i potters do not go to Chumbivilcas or Ccatca (1985, but in 1973 Camino said they went to Ccatca) with their ceramics, and other people in Cuzco take Raqch'i pottery to Quillabamba to exchange for *frutillada* (strawberry *chicha*). Other down-the-line redistribution may also exist.

Individual distribution locally

Consumers from distant locations come individually to Raqch'i where they obtain single vessels directly from the producers. This means of distribution, however, does not appear to be a major one. People from Pucara come to Raqch'i to obtain *p'ukus*, for example (never *rakis*), through barter or cash sale. Men from Pomacanchi and vicinity used to order *qocha urpus* in advance, and would come to Raqch'i to obtain them on the occasion of a daughter's marriage.

Two major advantages of distribution at distant fairs or markets over local distribution are that producers can sell or barter their pottery all at once rather than vessel by vessel, and they can exchange it for food products that are unavailable or scarce locally.

In 1979, the value of a *raki* in barter, determined by the supply and demand of food resources, was as follows:

1 *raki* is exchanged for that vessel:
full of barley, or
almost full of ears of maize, or
almost full of potatoes, or
just above the handles with *chuño*, or
to below the handle with broad beans.

Food is also exchanged in this way for *tumins*. Most smaller containers are not filled with food, but rather food is received in a *q'epe*, that is, a calculated amount in a *q'eperina* (carrying cloth). *Puruñas* and *p'ukus*, however, are filled with a small amount of food when exchanged at nearby locations, with extra added until full as the distance from the production center increases.

Valencia Espinoza (1982, pp. 65-66, figs. 4A-B) reports that a *raki* or a *mak'a* may be exchanged for maize according to the following measurements on

the vessels: to the neck for ears of maize; ideally, just above the handles but actually just below them for maize kernels; and farther below the handles for a loss to the potter. A pitcher is exchanged for two handfuls of maize kernels, as is a *wich'i*, although the number of handfuls varies with vessel size. A *p'uku* or a *chillaku* may be exchanged for a quantity of maize kernels filled level to the rim of each form. Valencia also provides the exchange equivalents for other ceramic vessels, like ollas, not produced by Raqch'i potters.

Barley, maize, and potatoes appear to be the most desirable products (they are the most valuable), and Camino repeated them in 1974 when talking about barter at the August 15 fairs. Barley and maize are obtained in Acomayo at the weekly Sunday markets. Pottery producers go to Paucartambo because the people there give a little more maize or other foodstuffs in exchange; this case also suggests that there may be added value for the distance traveled, although food supplies in Paucartambo could be a factor. Finally, people from the puna exchange quinoa for *urpus*. The cash value, which is the same in Raqch'i as elsewhere, of a *raki* in 1971 was 80 *soles*, while in 1973 it was 110-120 *soles* (the *sol* was worth $.0235 both years).

There has been a change in transportation, from llamas to burros to trucks and trains. People, of course, also transport vessels. The 1936 painting (fig. 2) shows llamas carrying ceramics, and Camino recalls that each family would transport vesels using 4-5 burros, taking about 5 days to go to T'iobamba, Paruro, or Paucartambo, and about 6 to Calca or Chinchero. When Leonarda was unmarried, and Camino remained in Raqch'i, she traveled to fairs with the family's pottery in the company of relatives. Litto (1976, pp. 27-28) notes that smaller pots are packed in dried grass and tied with rope nets into bundles called *chipas*.

To go to Cuzco, potters may contract a truck and accompany their pottery; a truck will carry 3-4 families and 40 *chipas* of pottery. If the load from Raqch'i is not enough to fill the truck, these potters may join people from Q'eya or be joined by those from Machaqmarka as the truck goes north. They may also take a truck to San Pedro, for 20 *soles* ($.47) in 1973, and there catch the train to Cuzco. In 1973, the amount a family might typically transport to Cuzco by train for a cost of 80-90 *soles* ($1.88-$2.12) would have been 10-15 *rakis*, 20 *tumins*, 30 *aysanas*, 20 *puruñas*, 30 *chillakus*, and 50-60 *p'ukus*. Additional expenses of such a trip would include breakage during transport, perhaps compensated for by higher prices for the surviving pots, as noted by Litto for Machaqmarka (1976, p. 27), and room and board while away from home.

Most Raqch'i pottery is distributed northward into the lower agricultural valleys, where the desired agricultural products are more available, rather than southward toward the altiplano. *Rakis* are in demand in the valleys of Cuzco and Calca where maize is grown and much maize *chicha* is made, while people of the puna use the *urpu* for *chicha* fermentation. *Chicha*-fermenting vessels are less frequently sold to the south, where less *chicha* is made. While there is competition from metal and plastic for functional vessels, tourists now buy imitation Inca vessels, which Raqch'i potters have begun to make and sell.

Acquisition of nonlocal ceramics used in Raqch'i

Because Raqch'i potters do not produce all the pottery forms they need, they must acquire the vessels from distant locations where they are made. An inventory of Camino's kitchen taken in 1973, although probably not representing a

complete list of vessels used in the household since some were outside the kitchen, included the following forms:

7 Pucara cooking ollas
2 small ollas containing salt
1 *rumi manka* (olla from Chumbivilcas) containing salt
1 small pitcher
3 small *p'ukus* or plates to use as covers
1 *hank'ana* for toasting grains (probably from Pucara)
1 small *tumin*
1 *mak'a*
1 *tumin* and smaller one
2 metal ollas, 1 metal top
1 metal bucket

Raqch'i villagers obtain cooking ollas (including *k'awchi mankas* for boiling *chicha*), grain toasters (*hank'anas*), and pitchers from Pucara. These vessels may be obtained either by going to Sunday market in Sicuani for direct purchase from people who come from Pucara; or by exchanging food or, less frequently, cash for them from Pucara people who come to Raqch'i. Raqch'i people give maize, barley, or peas in exchange. People from Pucara sometimes persuade those from Raqch'i to give them *p'ukus* as gifts.

The Raqch'i people may also obtain ollas from K'uchu'uma, another ayllu of San Pedro, higher and to the northwest, where ollas are made in small quantities, generally for local consumption. According to Camino, people from K'uchu'uma bring to Raqch'i ollas that are of a good quality, comparable to Pucara ollas. Finally, Raqch'i people buy ollas (*rumi mankas*, or "stone ollas") from Chumbivilcas at the Sunday market in Sicuani. It is also possible to obtain pottery at the Raqch'i fair, begun only about 1970 and held annually on the second Sunday in June. According to Camino, Raqch'i inhabitants only began to buy metal vessels around 1973. Roof tiles, once made in Raqch'i, are now purchased from Ansa (Colegio Agropecuario de Sicuani), where they are now made.

In general, then, when exchange is involved, produce is the commodity bartered. When Raqch'i potters take their pottery to distant fairs, they obtain food; when Pucara potters exchange their pottery in Raqch'i, they obtain food despite the apparent scarcity of food in the community; and when people from Espinar bring *taqu* for red paint, they obtain food. The value of the food obtained presumably covers the value of the commodity (e.g., a pot) plus the cost of transport. Moreover, with food there is the opportunity to bargain for a bit extra, the *yapa*.

Village Specialization in a Regional Context

As of 1973, some 60-70 of the 75 families in Raqch'i were making pottery.[7] Camino estimates that Q'eya and Machaqmarka are about twice as large, and most families in both villages make pottery. Table 1 (p. 177) presents the forms made in each village. Raqch'i and Q'eya potters make all forms, whereas large *rakis*, *urpus*, *puruñas*, and *chillakus* are not manufactured in Machaqmarka.

The finest pottery, according to Camino, is manufactured in Machaqmarka because the potters use only fine clay and do not mix the poorer quality clay with it. Raqchi pottery is second best in quality and that from Q'eya the poorest. On his visit to Q'eya in 1954, with Manuel Chávez Ballón, John H. Rowe noted that

Raqch'i and Chiknu were said to make the best pottery (Rowe, pers. comm., February 1986). His Q'eya informants also said that clay was located in Pichiyura, an ayllu of San Pedro, and in Chiknu. Although the clay used by Q'eya potters is the same as that employed in Raqchi, Q'eya pottery tends to break, according to Camino because their water is salty.

All three villages use the same volcanic temper from Kimsach'ata. The three peaks of the volcano form a rough equilateral triangle with one apex to the north, and the volcano is divided into three territories with boundaries formed by lines radiating from a point in the center of the triangle and running between the peaks. Each village has access to temper from one of these territories: Raqch'i the northernmost, Q'eya the southern, and Machaqmarka the more easterly one. Since it is an ayllu of Tinta, not San Pedro, Machaqmarka has to purchase its temper from Qocha (a San Pedro ayllu just north of the town), while Raqch'i, and presumably Q'eya, have or had free access to the material. Litto's reference to red sandstone purchased by the people of Machaqmarka from the people of San Pedro for temper is surely a reference to this basaltic scoria, which is frequently red and is referred to as "sand" in both Quechua and Spanish (Litto, 1976, p. 30). The pastes for each village are similar in their constituents, although Q'eya paste, according to Camino, may be more like that of Raqch'i, since Machaqmarka paste consists only of fine clay.

Although there is a potential for competition to develop over the external distribution of pottery, Camino stated that there is essentially none. Perhaps there is enough of a market for the entire production. Two factors may serve to reduce competition: not all forms are produced by all three villages, and not all villages or families participate in the same fairs (or perhaps markets). Camino repeatedly listed the fairs to which the people of Raqch'i take their pottery, and others exist at which similar pottery is distributed (e.g., Tinta: Valencia Espinoza, 1979, p. 187). Anyone within a village who wants to take pottery to a fair, or presumably to a market, does so, indicating a lack of competition among families within the village, and the same is true among villages.

Because Raqch'i potters apparently do not continue making ceramics when they move to nonproducing villages, pottery making does not spread beyond Raqch'i (or possibly the other two villages). Continued residence in Raqch'i is a requisite for making pottery, thus maintaining the exclusivity of specialization within that village, as well as perhaps controlling the boundaries of access to the limited clay and temper resources.

These three communities, all within an area about 5 km. square, specialize in producing an inventory of vessels for serving, storing, fermenting, and carrying, which I shall refer to as containers. This pattern of village specialization characterizes the south highlands as a whole. It may be seen to create a horizontal interdependency within a given ecozone in which nonpotters must exchange agricultural products (or pay cash) for needed ceramics, while potters can obtain the food they need to supplement their own, otherwise insufficient, harvests. Furthermore, there is a complementarity of pottery forms relating to function that corresponds to two vertical ecozones within the region. Only villages in the puna or altiplano produce and may specialize in cooking pots (ollas) or other vessels that are repeatedly heated by direct exposure to fire and cooled, such as grain toasters, stoves, and braziers/incense burners, while valley villages, like Raqch'i, Q'eya, and and Machaqmarka do not manufacture these forms, but rather only containers. Some puna/altiplano pottery-making villages also produce containers, however,

and are thus more nearly self-sufficient. Raqch'i potters, it has been noted, manufacture *urpus* especially for people of the puna, which they exchange for quinoa, assuring the high-elevation link.

Indeed, such ecozonal complementarity of vessel forms, I would argue, may be artificial rather than resulting from a lack of appropriate local materials (clays, tempers) or technology. As people need ceramics from both zones (whether they are potters or not), an interdependency is created between the two ecological zones, assuring a flow of other goods, especially food used in exchange for pottery. What maintains the complementarity of forms, and hence interdependency of zones, is an artificially maintained technological differential. Furthermore, the complementarity in vessel forms should reduce potential competition over external distribution, permitting each pottery-making area to supply a fair slice of the demand, hence facilitating the procurement of needed food.

Olla manufacture has been reported from Pucara, Checca near Santiago de Pupuja, Charamuray about 27 km. north of Santo Tomás in Chumbivilcas (Lizandro Lantarón Pfoccori, pers. comm., December 1982), Machaqa and Qoñamoro near Ccatca (Julián Percca Cruz, pers. comm., December 1982), Chita Pampa halfway between Cuzco and Pisac (Litto, 1976, pp. 21-22), and K'uchu'uma. All these locations except Charamuray are between 3700-3900 m. elevation, well into the puna/altiplano ecozone. While Charamuray is only 3000 m. high, it is possible that it, or the pottery-making location itself, is also in a punalike ecozone, since altitude is not the only determinant. In addition to ollas, however, bowls are made in both Pucara and Checca, and other containers in Checca (Cátedra de Folklore, 1966, pp. 124, 137; Spahni, 1966, pp. 45-48; Litto, 1976, pp. 35, 37). We were also told that *tumins* and *rakis* are made at Parcco about 7 km. southwest of Acha in Chumbivilcas (3425-3600 m.), although we do not know whether ollas are made there as well (Lizandro Lantarón Pfoccori, pers. comm., December 1982).

Further connections between the puna and pottery-making in the valley exist in the procurement by Raqch'i potters of some materials of production discussed above (p. 172). In at least one instance, the red earth from the Yauri puna, food is also involved.

Let us turn now to the question of whether the ecozonal complementarity of vessel forms results from naural or artificial causes. Raqch'i potters claim that they cannot produce good quality ollas because the volcanic temper they use causes their vessels to explode in the cooking fire. Pucara ollas have *ch'alla* (sedimentary rock, possibly shale or slate) as temper and do not break when placed over the fire. Similarly, K'uchu'uma ollas, made of a local clay, have locally-available *ch'alla* as temper. Conversely, a young potter from a pottery-making family in Pucara stated that the materials used by Raqch'i potters are more resistant for *rakis* than those used in Pucara. He noted that Pucara *rakis* would crack under the pressure of their contents.

It is logical to suppose, however, that Raqch'i potters could produce their own ollas (or other forms to be exposed to fire) if they needed to. When pressed as to why Raqch'i potters could not make ollas, Camino stated that: they do not have *ch'alla* available as at K'uchu'uma; they could not bring *ch'alla* because it is difficult to transport, even on burro, since it is rock; they do not know the correct proportions of *ch'alla* to use to prepare the clay; and while the K'uchu'uma potters could teach them these proportions, Raqch'i potters do not have the time. These difficulties are not insurmountable, however. Furthermore, volcanic

temper similar but not identical to that used by present Raqch'i potters, recovered from the early site of Pikicallepata 7 km. north of Raqch'i, show that such vessels can be made and used successfully (Chávez, 1982, p. 299). Finally, it would appear to be beyond mere coincidence that all sites producing cooking vessels, or others for exposure to fire, are located in the puna/altiplano (unless they share, for example, some common geological factor).

These findings tend to support the argument that ecozonal complementarity in vessel forms, as related to functions, is artificial rather than a result of the lack of appropriate materials. Potters in each zone have developed an efficient technology suited to the functional requisites of containing or storate on the one hand and cooking or heating on the other (Rye, 1981, p. 26). Technical studies or experiments, beyond the scope of this paper, need to be conducted to determine whether the potters are correct in assessing the limitations of their materials, and to clarify the role materials play in accounting for this functional variability by ecozone.[8]

Given the diversity of technological and organizational options possible in ceramic production, it would appear that certain choices are made to accomodate other socio-economic needs. The issue, then, is identification of the variables resulting in the male-female complementarity of forms, village specialization, and ecozonal complementarity in pottery forms/functions, or at least of the roles and interrelationships of such variables as materials, technology, and socio-economic needs and organization. Specific aspects of production technology that are apparently contrived serve to maintain coooperation and interdependence among people at various levels. In this case, a technological basis for interdependence rather than self-sufficiency has been created and maintained:

On the household level. The perceived inability of females to make male forms and vice versa results in the male-female complementarity of forms, which contributes to interdependence within the family.

At the village level. If the family cannot produce a full complement of forms, the apparently artificial inability to fire forms singly creates extra-household, intravillage interdependence. In addition, a person who moves to a nonpottery-making community can no longer produce ceramics, thus maintaining the exclusivity of ceramic specialization within Raqch'i.

On the regional level. The restriction of pottery manufacture to certain villages results in horizontal interdependence within an ecozone between pottery producers and nonproducers, while the perceived inability, due to differences in temper used, of valley villages to produce forms suited to exposure to fire, and of puna/altiplano villages to manufacture certain containers, effectively results in an ecozonal complementarity of forms that creates a vertical interdependence between ecozones. Nonpotters can only acquire a full complement of vessels by exchanging with potters in both zones, and potters by interacting with people in the other zone. Potters acquire needed food and nonpotters the pots. When pots move vertically between or horizontally within zones, so does the food used in exchange, thus evening out these resources and likely, indirectly, others.

The antiquity of these patterns of pottery production is not known. While Cosme Bueno (1951, p. 103) mentions that Raqch'i potters traded their vessels (at least *tinajas* and *cántaros*, a general reference to containers) with neighboring provinces in 1769, whether the village specialized only in containers and followed a division of labor by sex is not clear.

The skills, firing, or local availability of materials, I would argue, do not limit the production technology and organization to its current form, or preclude other alternatives. Nevertheless, the way technology has been modified within the socio-economic system has resulted in the production in each ecozone of efficient forms for certain functions, which are sought by consumers throughout the region. These vessel qualities can be empirically measured, and apparently reflect true efficiency. I would not claim, however, that pottery is the only item around which the interdependencies outlines here are created and maintained; there may well be others having the same effect.

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APPENDIX

Processes Used to Manufacture Ceramic Vessels in Raqch'i

Coil-built forms

Raki (diag. 1; figs. 33-35 of *tumin* manufacture are used to illustrate the similar process of making a *raki*, since *raki* are made inside.)

The entire construction process takes place in the shade inside the house, except for removal to the sun for drying. A flat-surfaced, rectangular stone

(*salluka*) set into the dirt floor, serves as the surface upon which the *molde* rests and construction occurs. The clay supply is set on another stone nearby (also called *salluka*). Screened ash (*ushpha*) is spread over the *molde* in a 0.5-2 cm. thick layer, which is evened using a flat stone called *t'aqllana* (fig. 23). The ash parting agent is used only for large vessels (e.g., *raki*s and *hatun tumin*s) and it fills the depression in the *molde* so that the base of the *raki* is flat rather than convex.

Measurements of a *raki* are determined as follows:

Overall height is determined by the height of the potter.

Height of *teqsi* = 1 *cuarta* (hand span) plus the length of the outstretched thumb to forefinger (called *wiku* or *weqe* in Quechua; Valencia Espinoza, 1982, pp. 47-48).

Base diameter = *molde* diameter. Perhaps coincidentally, the diameter of the *t'aqlla* (base) in diag. 1 is about 1 *cuarta*, a measure called *t'aqlla* in Quechua (Valencia Espinoza, 1982, pp. 48-49).

Teqsi diameter = length of a stick potters use that appears to be longer than the neck diameter.

Kupu rim diameter (i.e., interior neck diameter) = hoop (*pinku*) diameter; it is the neck diameter rather than the mouth diameter that appears to be consistently measured.

Uppermost part of the handle is placed 1 *cuarta* below the base of the neck (i.e., the top of the *kupu*).

The lower portion (*teqsi*) of the vessel is constructed first:

1. *Aqo* (volcanic "sand," also used as temper) is placed on the *salluka* and is smoothed with the *t'aqllana*. *Aqo* here functions as a sort of lubricant to facilitate rotation of the ceramic *molde* by preventing it from sticking on the *salluka*.
2. A ball of clay is placed on top of the *aqo*-covered *salluka* and is pounded flat, to a thickness of ca. 1 cm., using the *t'aqllana* (fig. 33), the left hand turning the clay counterclockwise. This tool is used in the same way for press-molded forms (fig. 42).
3. This clay, called the *t'aqlla*, is then placed on an ash-filled *molde* and is the same diameter as the *molde*. The *t'aqlla* becomes the flat base of the *raki*.
4. A roll of clay is flattened into a thick, wide, ring-shaped coil (*aro*, a Spanish word, or *aru*), using two fingers inside the coil. The coil, placed on top of the *t'aqlla*, is ca. 15 cm. in diameter and 8 cm. high (fig. 34). The *molde* is rotated clockwise, and the inside and outside are smoothed. The process of adding rings is called *arulla*. Nearby is a container of water, which may be a *chillaku* (figs. 34-35, 41-45), a *chamaka*, or an olla (fig. 40), and a soft piece of leather. The hand is wet so that the clay will not stick. This process is called *llaquch'ana*.
5. A triangular, stone *chawina* is used on the interior to enlarge the vessel diameter as each ring is added, and to finish the inner surface (fig. 35).[9] The *chawina* used on the *teqsi* is called *teqsi chawina* (fig. 24); there are larger and smaller *teqsi chawina*s depending on the size of the *teqsi*. Water is applied with a soft piece of leather to the *chawina*, which is held in the right hand with the long point downward, and pulled against the interior as the left hand rotates the *molde* clockwise. To obliterate the marks of the coils (a process called *buñi*), the *chawina* is moved with the right hand from bottom to top, horizontally or at a slightly diagonal angle. The interior and the top edge of the *teqsi* are also

wet, and this top edge is tapped with the *chawina*.

The number of rings used to form the now completed *teqsi* depends on the size of the *raki* and the size of the rings. Four "small" rings are used for a large *raki* base, fewer for a smaller one.

6. The *teqsi* on its *molde* is then taken outside to dry for two hours if sunny and four if shady;[10] it requires plenty of sun to be solid enough to support the rest of the vessel without collapsing.

The upper portion of the body (*kupu*) is then constructed:

7. Two more rings are added to the *teqsi*, still rotating the *molde* (fig. 36).
8. Five additional rings are added to complete the *kupu* and close the neck, but the piece is no longer rotated. Instead, stones are placed under the *molde*, to stabilize it, and the potter moves around the vessel to add these five rings. Vessel immobility insures that the piece will not collapse as the body of the *raki* curves inward to form the neck opening. The top edge of the uppermost coil is wet (a process called *hawina* = "to slip") every 5 minutes so the clay will not dry. The body now has a total of 11 rings. A different *chawina*, the *kupu chawina* (figs. 25-26), is used to finish the inner surface of the *kupu* while adding the rings. The *kupu chawina* is shorter and wider than the *teqsi chawina*.
9. A hoop (*pinku*) is inserted in the rim of the last ring added, to indicate where inward curvature of the wall should stop for the neck opening, thus insuring a consistent neck diameter, and to prevent inward collapse of the upper part of the *kupu*. Potters have several *pinkus* hanging inside on the walls (fig. 46); *pinkus* are made of a *capulí* tree branch, a string used to bind its overlapping ends, but may also be of wire. The *pinku* for the *raki* is called a *raki pinku*. Excess clay is removed from the vessel mouth when the hoop is inserted.
10. Final finishing of the interior is done using the *kupu chawina* with water, pounding the interior, and finishing it diagonally. The combination of *teqsi* and *kupu* together, but without handles and neck, is also called *kupu*.
11. The entire piece, still on the *molde*, is dried outside in the sun for 3 hours or more, longer than for the *teqsi*.[11] While the vessel is drying, the exterior of the *teqsi* is sprinkled with water about every 15-20 minutes, so that the *teqsi* and *kupu* will dry evenly, since the *teqsi* was already partially dried (step 6).
12. Two people, each with one hand under the *molde* and one hand on the neck opening, carefully carry the neckless, handleless vessel back inside and place it on the *salluka* again.

The exterior is then finished in several steps: *k'isuna*, *qaruna*, and *llamp'uña*, as explained below.

13. A *k'isuna* (fig. 27) is used immediately, while the surface is still moist, without using water, to even the outer surface by scraping it from bottom to top and sideways. The thin, partially curved metal *k'isuna* is of one size for all diameters (*rakis* and smaller vessels, such as *tumins*). Originally rectangular, the tool acquires concave edges on one end through use, and is used until so worn it can no longer be held in the hand. In the 1936 painting (fig. 2), the large jar is being finished with a tool shaped like an Inca *tumi*, though the depiction may not be accurate. Camino had never seen such a shape used.

The vessel exterior is then wet with water, using a hide, and the

opposite end of the *k'isuna* (the rectangular end, previously used as a handle/base) is used to even the exterior surface. This *k'isuna* process produces a surface just like that described for Early Horizon Marcavalle pottery from Cuzco, exterior of surface finish group I (Chávez, 1977, pp. 187-188; 1982, pp. 264-265). The *k'isuna* scrapings are collected and added to new clay.

14. The surface is then wet and smoothed using a *qaruna* (figs. 28, 29). The *qaruna* is ground into shape from a porous volcanic rock, probably scoria. Such a porous rock, lighter in weight and easier to transport than the nonporous volcanic rock of the area, is called *qanqawa*. In place of a *qaruna*, a sherd from a *raki* may be used.
15. When the exterior is still moist, it is well smoothed (*llamp'u*) with a hard, fine-grained stone polisher called a *llamp'uña*, which may have different forms (figs. 30-32). The rock, called *wini rumi*, is probably basalt. It is nonporous, and is heavier and harder to transport than the porous volcanic rock from the area. One *llamp'uña* (fig. 32) was a river stone, and a well-polished one was probably quartz. The latter was called *kesqa* and came from the province of Chumbivilcas (capital, Santo Tomás). It had belonged to Camino's grandfather, but such stones are no longer brought to Raqch'i. The *kesqa* does not wear down. Some people use glass bottle fragments for this purpose
16. At this point handles are added to the *kupu* (fig. 37). A *qaruna* is used to scrape the *kupu* for handle attachment. The handle (*rinri*, a word usually used for ear, but Camino differentiated the human ear as *ninri*) is made from a long coil, which is wet and pulled with the fingers until it is somewhat flat. The handle is wider at the top, and three punctations are made at that edge which is attached one *cuarta* below the neck rim.
17. The *pinku* is removed. By this time the *kupu* is dry and somewhat hard, so the *pinku* leaves a groove on the interior of the upper edge of the top coil.
18. The neck (*kunka*, also meaning human or animal neck) is now added, consisting of two rings, or one for a smaller vessel. The ends of a roll of clay are joined to form a coil about 6.5 cm. wide (fig. 38), which is applied to the neck opening which has first been smoothed with water using a small *chawina*. A second coil is added, and with his left hand the potter squeezes the vertically-oriented rings diagonally. He walks around the vessel with both hands on its neck, thumbs on the outside, wetting the clay while flattening and pushing the top of the neck outward from the interior. Then, with one hand on the interior, the *chawina* is moved from the bottom of the neck upward on the exterior. With water and the hand, the neck is gradually worked open to a flaring shape. With the *chawina*, the rim top or lip is smoothed. The potter smooths the interior of the neck with water using only his right hand as he walks around the vessel. Finally, extra clay is added on the outside all around the union of body to neck, reinforcing it.
19. Upon completion, the vessel is dried in the shade inside the room, still on the *molde*, for 7-14 days, depending on whether there is a lot of air movement in the room to hasten drying.[12] The vessel would crack, especially the neck, if taken outside.
20. A final smoothing of the exterior is made using the same fine stone (*llamp'uña*) as before, but here the tool is called *llunk'una*, as is the process.[13]
21. Final drying is completed in the sun. The vessel is taken outside to the

patio for about 5-14 days (1971), 7-9 days (1973), or 2-3 days (1974); that is, generally drying takes a week or more, but if the vessel is constantlly turned, exposing all sides to the sun, it can dry in 3 days (1985). Only to avoid rain would it be carried inside during that time. The ground is wetted to permit the insertion of stones under the *molde* for stability. All the drying, rather than the firing, shrinks the vessel, perhaps as much as 8 cm. in height (not measured).

22. The vessel is slipped and painted either just before firing or one or two days before. Slip takes about 11 minutes to dry, and paint 4 minutes, for a total of 15 minutes. Slip is made of a fine yellow clay, which is ground and mixed with water to the consistency of heavy cream. It is applied to the exterior and to the neck/rim interior with a soft piece of leather, a process called *hawina*.
23. The only color used to paint *raki*s is red. A horizontal band is painted on the lip and around the neck exterior; four crosses are equidistantly spaced on the neck interior, and a circle with two divergent appendages is painted around the handles (fig. 39). Unspun sheep wool is used to paint the designs.
24. The vessel is then fired (see pp. 170-172). Just prior to firing, the vessel is removed from its *molde*.

Urpu

The smaller-mouthed *urpu* is made in the same way as the *raki*, including exterior smoothing using a *qaruna*. The hoop, having a smaller diameter for the neck, is called an *urpu pinku*. Black paint is used on *urpu*s.

P'ampana

The *p'ampana*, the large, 17-20 coil *raki* which is no longer produced, was made entirely indoors, since it was too heavy to move outside.

Tumin

*Tumin*s are also made in the same manner as the *raki*. Ash on top of the *molde* is used only for *hatun tumin*s because they, too, are heavy and would otherwise tend to stick to the *molde*. For smaller vessels, such as the *tumin*, the clay base is placed on the bare surface of a flatter *molde* without ash, although some of the *aqo* used on the *salluka* when the base was flattened may still adhere to it. The *tumin* is removed from the *molde* the same day it is made. Some people paint *tumin*s with white, red, or black paints. The *tumin* of fig. 5 has a red horizontal band on the lip and interior of the rim, another on the exterior at the neck, and a third below the neck, while a red band encircles the handle.

Lavador

Lavadores, also made on *moldes*, are built of two coils (fig. 40). The interior is finished by using first the *chawina* and then the *llunk'una*; the outer surface is finished by employing the *k'isuna*, then the *qaruna*, and finally the *llunk'una*.

Press-molded forms

Puruña (diag. 2; figs. 41-45 show similar steps in making a *p'uku*.)

1. *Aqo* is mixed with finely-screened burro dung and placed on the *hatun salluka*, a large, flat stone slab. This mixture prevents the clay from sticking to both the *salluka* and the mold. The potter calculates the amount of this parting agent to use, about one handful (*haft'ay*) for one large *puruña* (fig. 41).
2. A mass of mixed clay (*t'uru*) is then placed on the *hatun salluka*. The *t'aqllana* is used to pound the clay uniformly flat and to the appropriate diameter. The mass is turned counterclockwise in the process (fig. 42).
3. The flattened clay is slid by hand from the *salluka* into a fired *puruña*, which serves as the mold. This mold, which is empty, is also called *molde*. While the mold is turned clockwise, the clay is slapped with the hand to acquire the form of the mold. Finger marks are evident on the clay.
4. The interior is patted slowly and smoothed, using the right hand, removing the finger marks. The mold is rotated clockwise on the *salluka* during this hand-smoothing process.
5. The interior is then formed with a *chawina*, from the bottom up and horizontally, to thin the walls. The *chawina* is held in the right hand while the left hand turns the mold clockwise (fig. 43). Any excess clay on the rim is cut back to the size of the mold with the *k'isuna*. However, the rim extends above the rim of the *puruña* mold so that the rim-to-base height is the same as that of the mold (diag. 2). The thickness of the base can be tested with the finger, and a lump of clay added to the bottom of the interior if it is too thin.
6. With water and the *chawina*, the interior is evened and given its shape.
7. A soft piece of sheep leather (*lapa*) is used on the rim and interior to provide a final surface finish. The wet leather is held on the lip with the right hand while the left hand turns the mold back and forth and, at the end of the process, clockwise.
8. The piece is dried in the sun for 20-30 minutes inside the mold, shrinking in the process. When somewhat dry it is separated from the mold; the parting agent assures that it does not stick.
9. After removal from the mold it is dried in the sun for one day, for two days if there is no sun.
10. Some people embellish *puruñas* with white (using *chaqu*), red (*taqu*), or black (*chinchi*) paint. White is applied on the interior to about one inch below the lip. Red is used only on the lip, and sometimes a black wavy line is painted over the white.
11. The piece is fired (see pp. 170-172).

Chillaku

Essentially the same steps used for the *puruña* are used to manufacture the *chillaku* or small *puruña*.

P'uku

P'ukus are also made in a manner similar to that of *puruñas*. Steps 1-3 are as above (figs. 41-42), step 4 is omitted, and steps 5 and 6 combined (fig. 43). For step 5, it was observed that a soft piece of leather was used to wet the piece before using the *chawina*, which was held with the pointed end up.

The *k'isuna* is not needed for a *p'uku*. For step 7, however, the entire mold is held in and rotated with the left hand while the right hand moves back and forth over the lip (figs. 44-45), smoothing it by hand (rather than with a soft piece of leather as used for the *puruña* or *chillaku*). In step 8, the vessel is dried for 10 minutes to one hour, when it is ready to be removed from the mold (fig. 43). Subsequently, the *p'uku* may be painted, as indicated for *puruñas*, and it is fired.

Depending on consumer demand and whether the potter has time, an annular base may easily be added to the *p'uku*, providing stability to the otherwise convex base. The annular base is attached when the *p'uku* has dried somewhat and has been removed from its mold. The partially dried *p'uku* is inverted so that it rests on its rim on the inside of the mold. The surface of the base where the attachment is to be made is moistened with water. The base, a thin clay coil, is attached, and finished with a soft piece of leather.

NOTES

[1]The spelling of Quechua words in this article follows the orthography of Baca Mendoza and others (1970) except that we have not used an internal j, but rather the appropriate k or q. Place names for the San Pedro-Tinta region (inset on fig. 1) follow this convention as well, but all other place names that could be located on maps follow the spelling on the following maps of the Instituto Geográfico Nacional: Cuzco, 1:100,000, 1984 1st edition; Santo Tomás, 1:100,000, 1973, 1st edition; Sicuani, 1:200,000, 1965, 3rd edition; Calca, 1:100,000, 1977, 1st edition; Cusco, 1:200,000, 1964, 5th edition.

[2]See also Valencia Espinoza (1982, pp. 65-66, figs. 4A-B) for various vessel forms included here, especially the *raki*.

[3]Litto (1976, p. 30) states that Machaqmarka potters obtain clay from beds in the nearby hills.

[4]This identification was kindly made by David B. Jorgenson, Department of Geology, Central Michigan University.

[5]This section is based primarily on information provided by Martha Farfán de Chávez and Felipa Tupayachi Zabala, residents of the city of Cuzco, in June 1973 and December 1982.

[6]In 1971 Camino said that Cuzco was the northernmost limit of Raqch'i pottery distribution, while in 1973 he said Urubamba and Calca were the farthest north. I do not know whether this northern limit actually expanded, or whether Camino simply recalled the limit differently each time. The southernmost limit was also farther north in 1971 and 1973 than he indicated it to be in 1974.

[7]Camino's estimate of the number of potters was expressed in terms of families, further indication of the family as the production unit.

[8]I consulted Dr. William Melson, Curator, Division of Petrology, Department of Mineral Sciences, Smithsonian Institution, and Professor Suzanne De Atley, then

of the Program in Anthropology/Archaeology, Massachusetts Institute of Technology, about the possible constraints resulting from the use of these different tempers. Both experts agreed that the differences between the volcanic and sedimentary materials should not be sufficient to limit the functions to the vessels.

[9]Litto (1976, pp. 29-30) indicates that in Machaqmarka carved wooden ribs are used to smooth and form the interior walls of coiled pottery.

[10]Time indicated in 1974 and 1985. In 1973, however, Camino gave the length of time as one half to one hour, depending on the sun (also in 1971, one hour), although he may have referred to the *tumin* that Rodríguez was making.

[11]Time recorded in 1974 and 1985. In 1971 Camino said one day, and in 1973, forty minutes to one hour, although the latter, again, may have referred to a *tumin*.

[12]Time indicated in 1971, 15 days; in 1973, 4-5 days; and in 1974, 7 days, all close to the range given here for 1985.

[13]Litto (1976, p. 29) notes that in Machaqmarka a small stone is used to burnish the exterior of the flat-bottomed vessels made on a rotating support, after the rim has been added and the pot uniformly hardened.

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KEY TO ILLUSTRATIONS

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Figs. 4 and 6. Indentation on lower interior indicates the juncture of the *teqsi* and the *kupu*.
Fig. 8. Pouring lip reconstructed from photos, as it was not profiled in the field; the rest of the vessel was drawn in Raqch'i from a specimen.
Fig. 10. Interior surface had a pinkish-orange wash.

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Fig. 14. *Molde* for the *p'ampana*.
Fig. 15. *Molde* for the *hatun raki*.
Fig. 16. *Molde* for the *huchuy raki* and *tumin*. Horizontal lines at the pedestal indicate the point to which this new *molde* would wear with use.
Fig. 17. *Molde* for the *aysana*.
Fig. 18. Two ceramic supports with incised potter's marks.
Fig. 19. Four ceramic supports, the two to the right show a pedestal. Stone *t'aqllana* in foreground, cowhide (ca. 80 cm. long) in background. July 16, 1973, house of Martín Rodríguez.

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Fig. 20. On far left, a pile of clay and a *puruña* full of clay; on far right, a *puruña* (diam. 39.5 cm.) full of unscreened temper; round tin sieve (34 cm. diam., 7 cm. high, holes 2-3 mm. diam.). Rectangular tin sieve (39 × 30 × 10 cm. with holes 3-4 mm. diam.) is to screen ground clay.

In the background is a stone rocker mill, in center foreground a pile of mixed screened clays. July 1973, house of Martín Rodríguez.

Fig. 21. María Quifle Quisluyo, grinding dry clay on the *maran* with a *tunaw*. July 1973, house of Martín Rodríguez.

Fig. 22. Note *raki* on right, *p'ukus* drying in *moldes* on floor, and *tumins* in the background.

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Fig. 25. Note beveled edge with horizontal striations from use.

Fig. 27. In the plan view, the curved portion is drawn as though flat.

Fig. 28. The flat side to the right is used, and one edge shows horizontal use striations.

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Fig. 29. The top and side surfaces are slightly concave from use.

Fig. 30. The right, slightly concave edge is smoothly polished from use.

Fig. 31. The left edge is slightly concave from use.

Fig. 32. The left edge is slightly concave from use, and is banded parallel to this edge; the top edge also shows some use.

Fig. 33. Flattening the *t'aqlla* on an *aqo*-covered *salluka*, using the *t'aqllana* in his right hand. In the right foreground are a *p'uku* with *aqo*, and a flat stone with clay. Ash from a *puruña* is being put on a *molde* upon which the *t'aqlla* will be placed.

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Fig. 34. Coils are added to form the *teqsi*. Note the water container, here a *chillaku*, in right foreground.

Fig. 35. A wet *chawina* is used to smooth the interior and enlarge the diameter of the *teqsi*.

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Fig. 36. Adding a coil to the *kupu*. The *teqsi* is below the wall angle, that will be rounded. The piece, on its *molde*, rests on the *salluka*, which is imbedded in the dirt floor.

Fig. 37. Adding handles to the body. Note stones under the *molde* to stabilize the platform.

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Fig. 41. The left hand sprinkles the parting agent from a *p'uku* onto the *hatun salluka* on which the oval lump of clay in the right hand will be placed. A *chillaku*, on the left, is used as a water container.

Fig. 42. Pounding the lump flat with the *t'aqllana* while turning the clay counterclockwise.

Fig. 43. Forming and finishing the interior, using a *chawina*. In left foreground are *p'ukus* drying in their molds.

Fig. 44. As the piece is turned with the left hand, the right smooths the interior.

Fig. 45. Hand smoothing the vessel lip and interior.

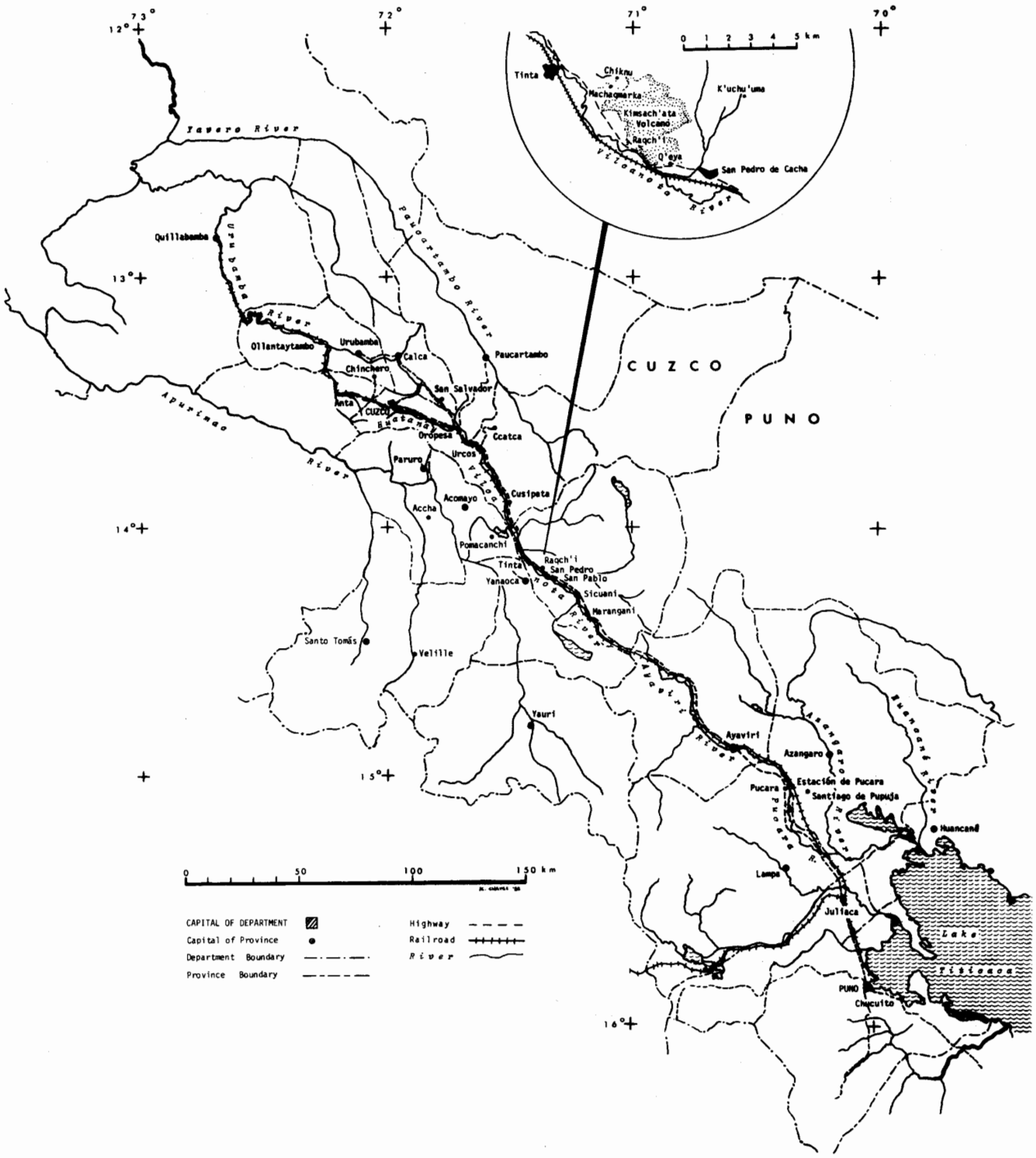
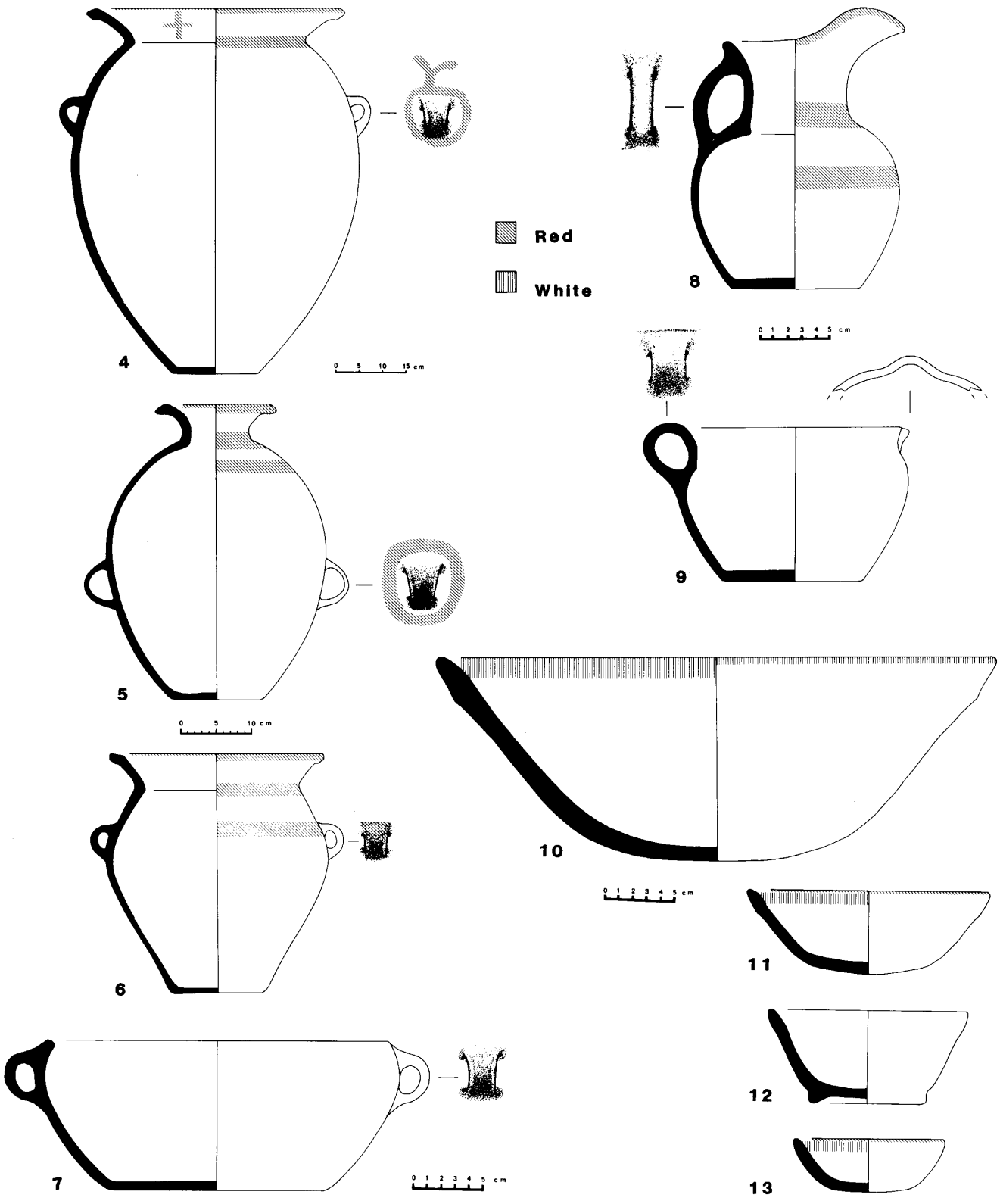


Fig. 1, map locating the Raqch'i area and other sites mentioned in the area.

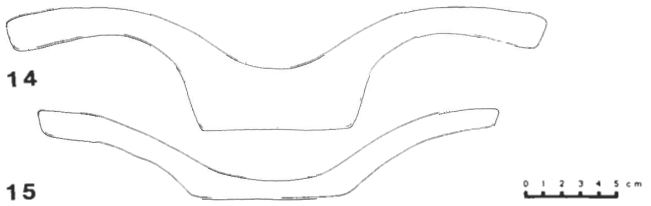
2

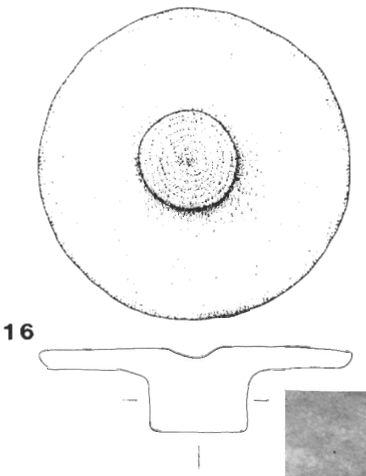
3

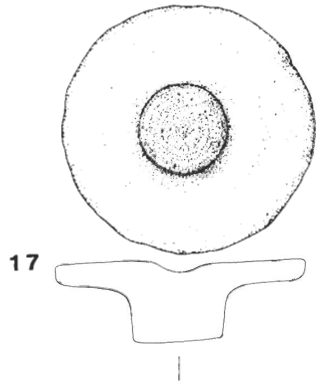
Fig. 2, untitled painting by Angel Rozas, 1936, of pottery making near Raqch'i; property of Manuel Chávez Ballón, Cuzco. **Fig. 3**, vessels made in Raqch'i, shown in patio of Florentino Camino's house, July 11, 1971. From left to right: top row, *raki*, *huchuy raki* (small *raki*), *mak'a* (large *tumin*), and *tumin*; bottom row *chamaka*, *chillaku* (small *puruña*), *aysana* (*jarra* or pitcher), *p'uku*, *kamaña*.



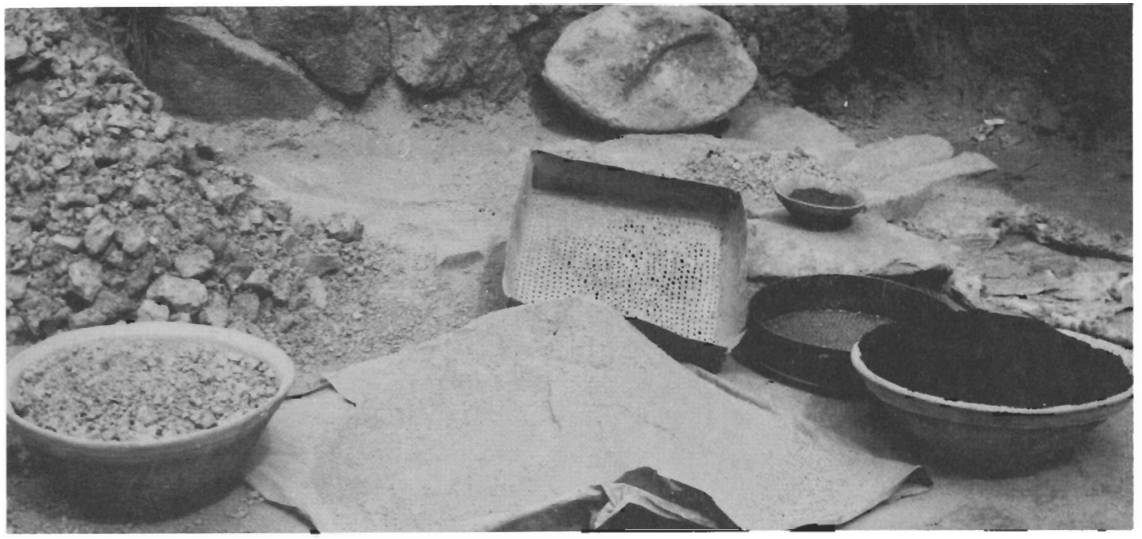
Some vessel forms manufactured in Raqch'i (note that scales vary). **Fig. 4,** *raki*; **fig. 5,** *tumin*; **fig. 6,** *kamaña*; **fig. 7,** *chamaka*; **fig. 8,** *aysana* or *jarra*; **fig. 9,** *wich'i*; **fig. 10,** *puruña*; **figs. 11-12,** *p'uku* (12 has annular base); **fig. 13,** *una p'uku* (small *p'uku*). See Key to Illustrations.







Figs. 14-19, pottery supports for rotating coil-built vessel forms during manufacture. See Key to Illustrations.



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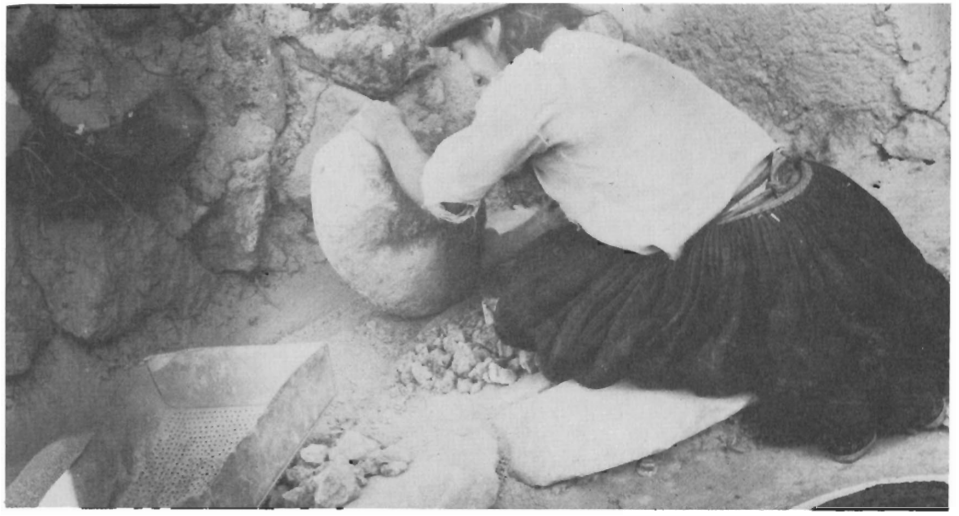

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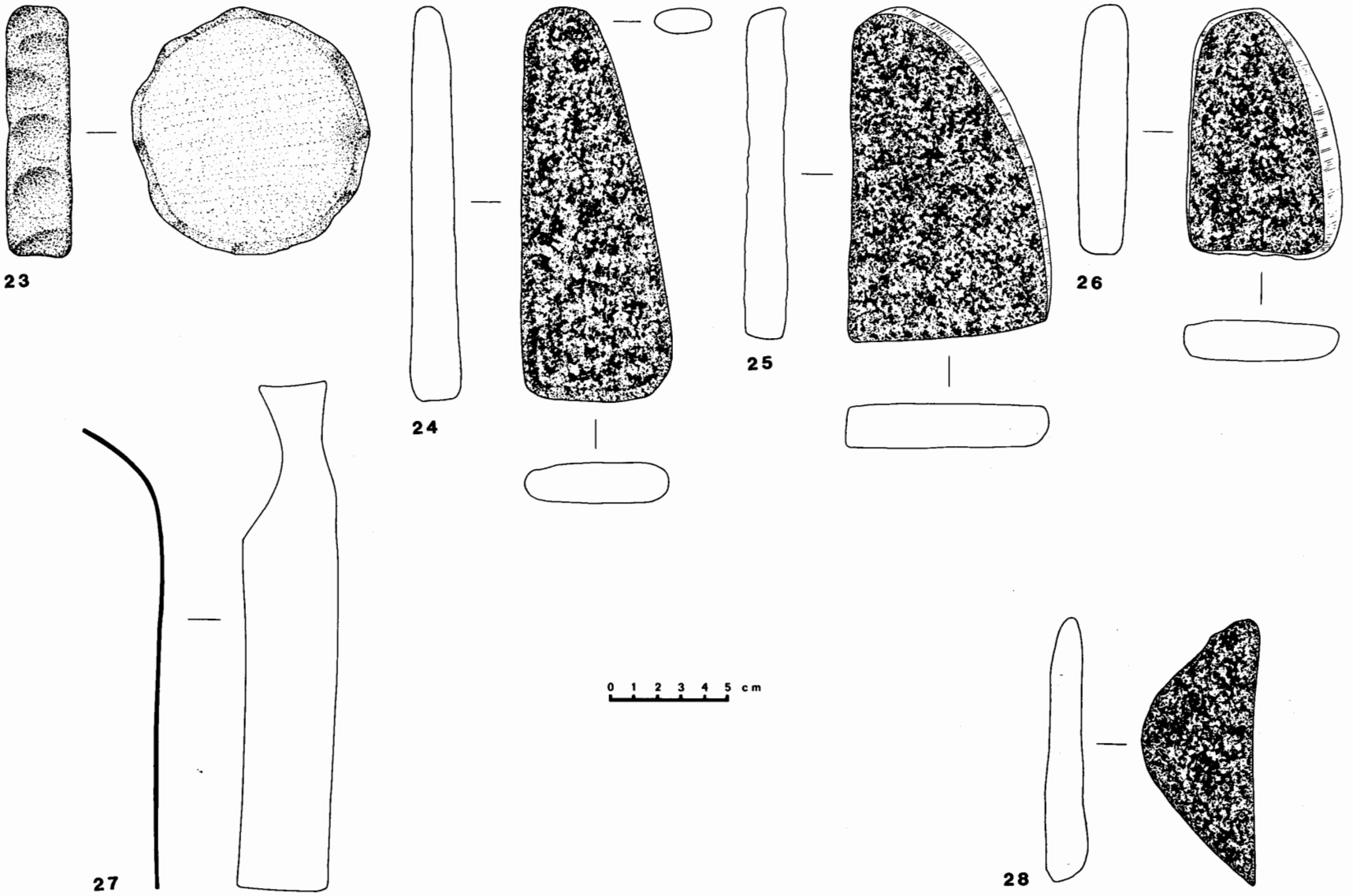
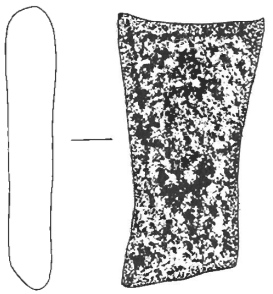
Figs. 20-21, materials and equipment used in clay preparation; **fig. 22**, Leonarda Camino kneading clay inside Florentino Camino's house, 1974. See Key to Illustrations.



Tools used in Raqch'i pottery production. **Fig. 23,** *t'aqllana*; **fig. 24,** *teqsi chawina*; **figs. 25-26,** *kupu chawina*; **fig. 27,** *k'isuna*; **fig. 28,** *qaruna*. See Key to Illustrations.



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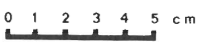

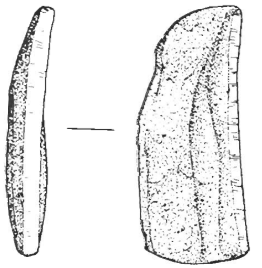

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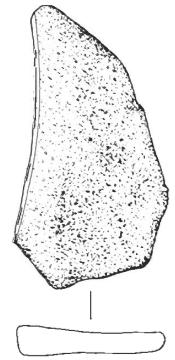

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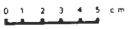

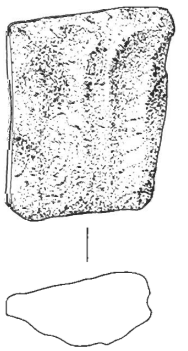

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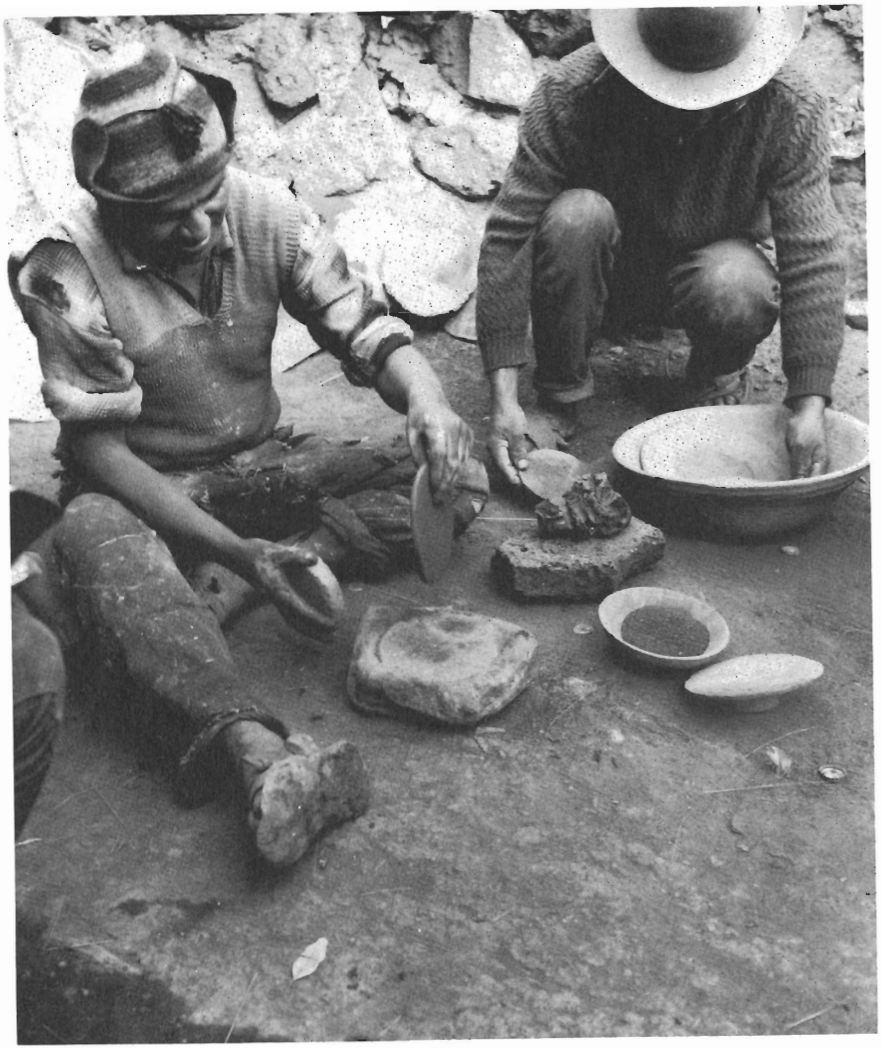

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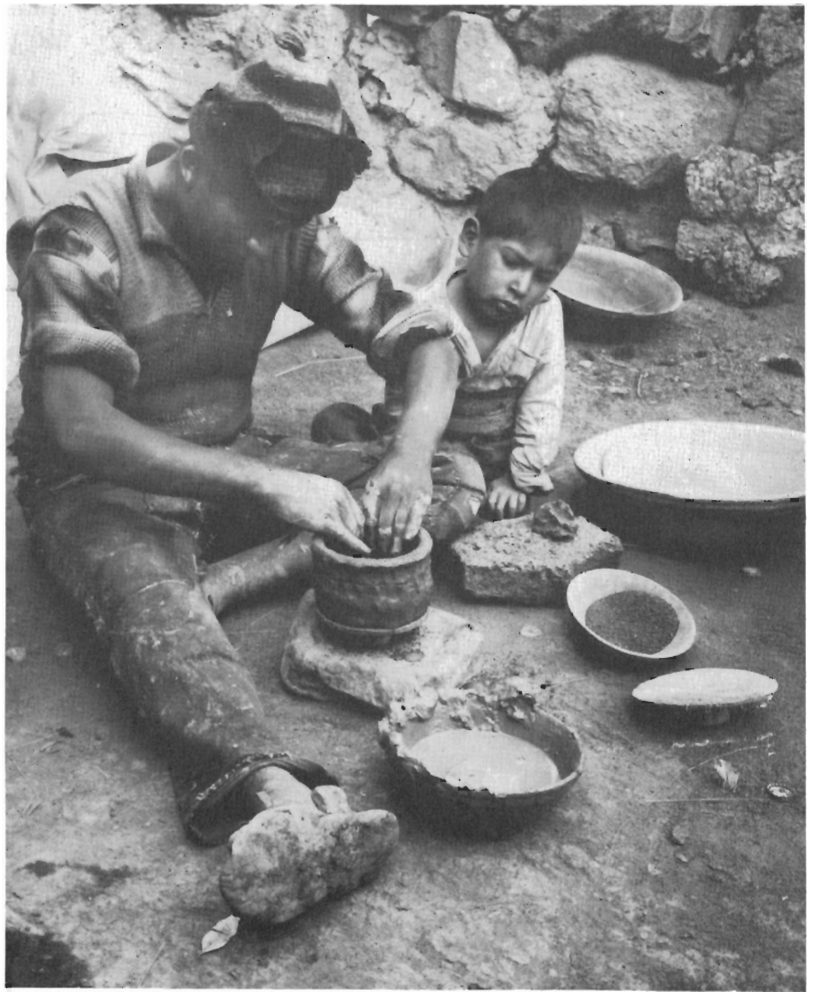
Figs. 29-32, tools used in Raqch'i pottery manufacture: fig. 29, *qaruna*; figs. 30-32, tools used as both *llamp'uña* and *llunk'una*. **Fig. 33**, Martín Rodríguez making a *tumin*, 1973. See Key to Illustrations.



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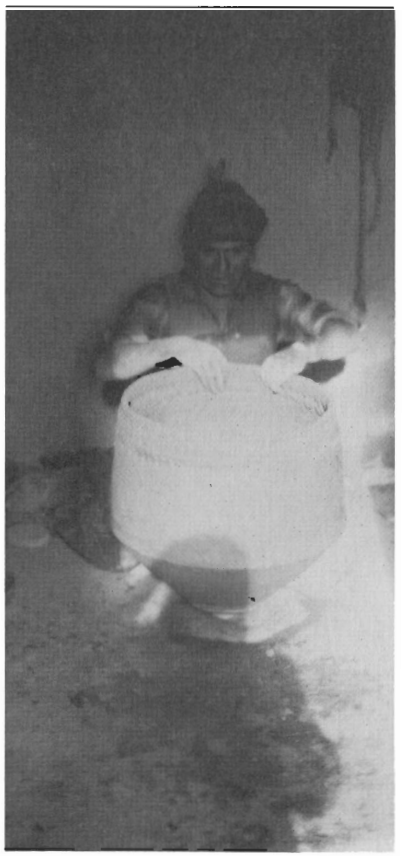
Figs. 34-35, Martín Rodríguez making a *tumin*. See Key to Illustrations.



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Figs. 36-38, Martín Rodríguez making a *tumin*, 1973. See Key to Illustrations.

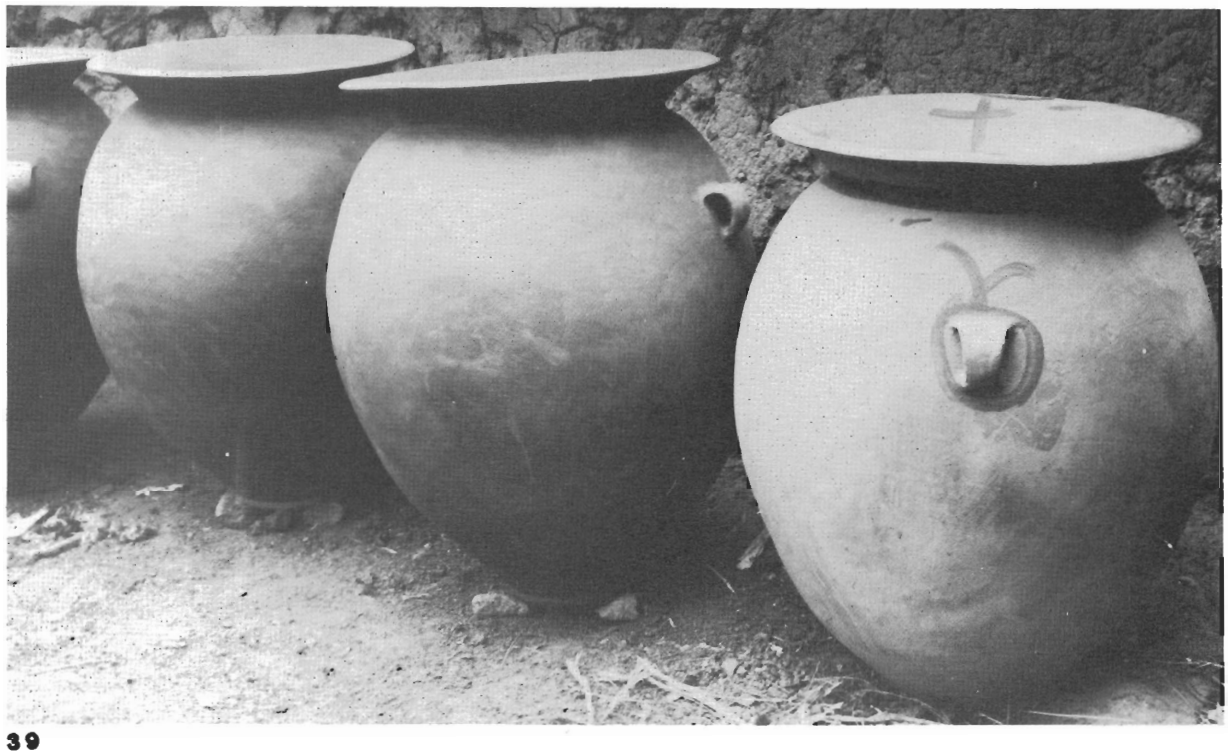

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Fig. 39, painted *rakis* ready for firing; **fig. 40,** Nicasio Mamani finishing the interior of a *lavador*, 1974.

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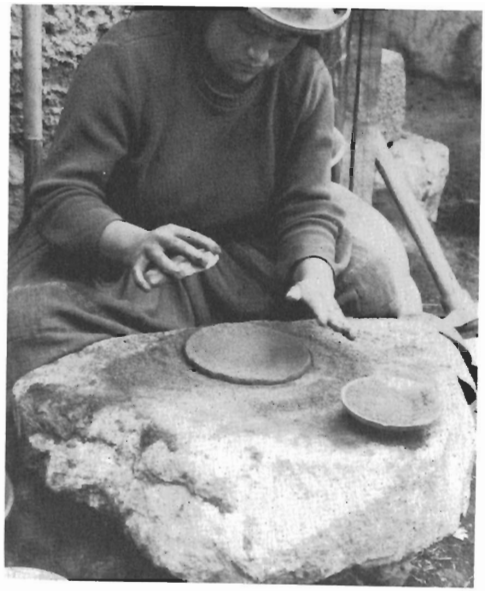

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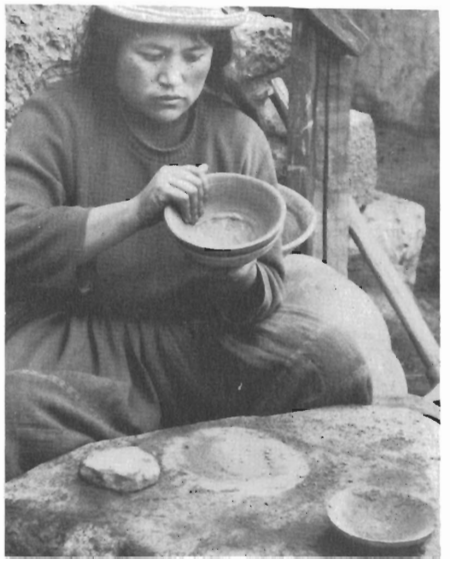

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Figs. 41-45, Leonarda Camino making a *p'uku*, 1974. See Key to Illustrations.

Fig. 46, vessels produced by Nicasio Mamani, 1974. On the wall are hoops (*pinkus*) used in measuring and supporting neck circumferences.