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OUR KNOWLEDGE
TRADITIONAL FARMING PRACTICES IN RURAL BOLIVIA

VOLUME II: TEMPERATE VALLEYS REGION

A TEXTBOOK BY SUBSISTENCE HOUSEHOLDS
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PREFACE TO VOLUME II.

This is the second of what will eventually be a three volume work describing the farming practices of Bolivian peasants in the Altiplano, Temperate Valleys, and Tropical Lowlands regions. For those readers who have not had an opportunity to read the Preface to Volume I, it is necessary to briefly review the purpose of Our Knowledge, who are its authors, for whom and why the book was written, and how the information was collected and edited.

The Purpose

Our Knowledge is an attempt to provide a comprehensive overview of the subsistence practices and lifestyle of Bolivian peasants. Such are the differences from one region to another that each could be a separate country and deserves a volume of its own. Each volume describes (1) the communities and households that provided the information, (2) general aspects of agricultural activity, (3) farming practices for specific crops, (4) livestock practices, (5) food preparation, (6) hygiene and health, (7) artisan crafts, and (8) holidays and celebrations.

The Co-Authors

In contrast to virtually all other descriptions of rural Bolivia, Our Knowledge was written by peasant households themselves rather than outside professionals. Exactly 139 rural families from 13 communities participated actively in the study which produced this book. The contents are based on written narratives and daily diaries keep by these families over a 24-36 month period. The choice of subjects was guided by what these co-authors considered to be important about their lives. The document represents the viewpoint of the rural poor, not outside observers. Most of the co-authors are native Aymara or Quechua Indians. About one-third of them are illiterate. They were able to contribute

written material to the book by using school children or project field staff as their scribes and translators.

The Project Sponsors

Our Knowledge is the result of a three year enterprise known as the Traditional Practices Project (1979-1982). It began in the Altiplano and Valleys regions in 1979 and was extended to the Tropical Lowlands in mid-1980. For the first year the only formal project participants were male household heads, and the focus of information gathering was placed mainly on agricultural and livestock practices. But during the last two years female household heads were included and the range of project topics expanded to include food preparation, health, hygiene, artisan crafts, and holidays and celebrations.

The Traditional Practices Project has had four primary sponsors. The project was initially conceived by Rural Development Services (RDS), a New York-based consulting firm specialized in the design, management, and evaluation of development programs serving the rural poor. In 1979 RDS presented a research proposal to the Agency for International Development (USAID), which consented to finance the project's external dollar costs. At the same time the Bolivian Ministry of Agriculture (MACA) agreed to help finance the local currency costs of the project. Finally, to expand the project to cover female respondents, USAID provided a budget amendment in 1980 followed by a second in 1981--which was administered through Cornell University--to help finance the considerably expanded content of the research.

For Whom and Why the Book was Written

Our Knowledge was written for two different reasons and for two very separate audiences: farmers and non-farmers.

The first reason was simply to demonstrate that it could be done--to prove that even illiterate households could actively participate in the writing of a textbook about themselves. We sought to demonstrate a process, using daily diaries and unstructured narratives, which would allow peasants to explain their way of life to outsiders. The very act of participating and controlling information in this way has been a source of great pride as well as a significant educational experience for the households involved. By describing themselves they have created their own record; they are no longer "invisible"; they no longer feel apologetic about their poverty and way of life; they now count for something. Every co-author of Our Knowledge has received a personal copy of this document--a testimonial to their individual and collective efforts.

The second reason this book was written was to educate outsiders or non-farmers about what campesinos know. We sought to demonstrate that peasants have a great deal of worthwhile knowledge which needs to be consulted and integrated with the ideas of outsiders if rural development efforts of lasting success are to be achieved. Our Knowledge provides a handy reference for outsiders who wish to know more about Bolivia's indigenous peoples but lack the time to visit them in their villages or spend hundreds of hours asking questions and listening to farmer's opinions. In particular, it is hoped that this book will prove useful to university students, farm extension agents and researchers, community development agents, national planners, consultants to rural development programs, government policy-makers, the staffs of international development assistance agencies, and personnel of private sector voluntary agencies seeking to assist the rural poor.

How the Information was Collected and Edited

For each of the three main geographical regions of the country a Bolivian professional was hired to supervise the project. Communities were selected in accordance with considerations of locational diversity, access, settlement type, and most important of all, the expression of interest by local residents. Families chosen to participate in the project were selected by the general assembly of residents of their respective communities. When women participants were added to the project, these were taken from the same households where men had participated from the beginning. Each male or female respondent was paid a stipend equivalent to US$5 per month to keep a daily diary of his or her activities. Periodically, respondents were asked to prepare written narratives--individually or in groups--on subjects of interest chosen by themselves. Once a month all respondents were visited in their homes by their Bolivian supervisor. About four times a year project participants were visited by external staff. At least once a year conferences of participants at the regional and national level were held to interchange information and give respondents the opportunity to learn discussion group and "lecturing" skills.

Field activities terminated in July 1982. At that time all diaries were read by project staff, summarized, and returned to their authors. All narrative descriptions were organized into subject matter headings. For each subject, the content presented in Our Knowledge is actually a composite summary taken from the narratives and journals of any and all farmers who had anything to say about that subject.

Volume I: Altiplano was written between May and November 1982. Volume II: Temperate Valleys experienced considerable delay due to the exhaustion of the project budget and had to be mostly financed by Rural Development Services on a piecemeal basis. Its writing began in December 1982 and was completed in January 1984.

The final draft of this book was written in New York, thousands of miles distant from the other co-authors. Since the editor did not have the luxury of contacting his campesino colleagues by phone whenever confronted by a problem of content or interpretation, it is possible that in some instances the facts have been assembled incorrectly. For these errors the editor asks the indulgence of both the co-authors and the readers.

All values in Bolivian peso currency given in this book have been converted to U.S. dollar equivalents at the following exchange rates:

-Before Nov. 1979:	20 pesos = US$1
-Nov.1979--Jan.1982:	25 pesos = US$1
-After Jan.1982:	44 pesos = US$1

In the English text, all terms in Spanish, Aymara, or Quechua are underlined only the first time they appear in a given section. Where the meaning of these foreign words is unclear, the reader is referred to the Glossary at the end of each volume

CHAPTER I.

THE CO-AUTHORS OF THIS VOLUME: FIELD STAFF, COMMUNITIES, AND RURAL HOUSEHOLDS

From the Temperate Valleys Region of Bolivia, three rural communities were selected to participate in the Traditional Practices Project: Puca Puca, Huayculí, and Melga. Puca Puca is located some 220 kilometers southeast of the city of Cochabamba, and about two kilometers outside Aiquile in Campero Province. From Puca Puca a total of 17 households participated in the project, contributing 15 men and 15 women record-keepers. Huayculí is a rural village whose principal economic activity is the making of pottery. It is located about 45 kilometers southwest of Cochabamba, roughly mid way between the towns of Cliza and Tarata, in the Province of Esteban Arce. Twelve male household heads and eleven females participated in the Traditional Practices Project. Melga is a progressive rural community located some 30 kilometers northeast of the city of Cochabamba, just off the paved highway to the Chapare. Thirteen resident households participated in the project, each contributing one man and one woman to keep family records.

Two supervise household record-keeping as well as gather additional information, the project employed two Bolivian professionals--one male and one female--both native speakers of the Quechua language.

In the following pages of this chapter we first present brief biographical sketches of the project's two very dedicated field staff for the Temperate Valleys Region. Next is presented a two-page description of each of the selected communities, followed by photographs and personal data about each record-keeper and their household.

BOLIVIAN FIELD STAFF FOR THE TEMPERATE VALLEYS REGION

IN MEMORY OF

José Victor Morales Morales
(1939--1983)

From May 1979 through July 1981, JOSE VICTOR MORALES served as the Bolivian Supervisor of the Traditional Practices Project for the Temperate Valleys Region. José was born in San Lucas, Department of Chuquisaca. His professional life began in 1958, when he graduated as a Professor of Rural Education at the Normal School Caiza D. Ten years later, José received a second degree as Professor of Urban Education from the Normal Superior La Paz. His public school teaching experience included the directorship of a Núcleo Escolar (1960-1965), normal school professor of Social Sciences (1967) in Oruro, professor of Mathematics, secondary level, in Tarija (1970-1971), and in La Paz (1972-1977). In 1977 José graduated with a degree in Sociology from the Universidad Mayor de San Andrés. Before joining the staff of the Traditional Practices Project, he participated in several important field research projects including (1) Socio-Economic Situation of the Slum Population of La Paz (1976); (2) Socio-Linguistic Study of the Quechua; (3) Behavior of Quechua Fathers and Sons in Rural Zones, Suburban Populations, and Cities (1977); and (4) Research on Traditional Use of Coca, with Dr. William Carter and Mauricio Mamani (1977-1978).

A bachelor until only two months before his death, José Morales died suddenly on October 12, 1983 at the age of 44, a victim of chagas disease. He did not live to see the publication of this volume, a

document which reflects his great dedication, energy, and love of the rural poor. May this comprehensive document stand as a lasting monument to the memory of José Victor Morales, an excellent professional and a human being of great social conscience, whose premature death is not only a profound sorrow to his many friends and colleagues, but a tragic loss for Bolivia.

Marina Ortuño Civera

From June 1980 through July 1981, MARINA ORTUÑO CIVERA served as a Bolivian Supervisor of Participating Rural Women in the Traditional Practices Project. Marina was born in 1948 in Padilla, Department of Chuquisaca. She completed her primary and secondary education in Padilla. She then undertook professional studies at the Paracaya Normal School "Manuel Ascencio Villarroel" (1964-1967), obtaining the degree of Professor. Marina served as a rural school teacher in Chuquisaca from 1968 to 1977. She then joined the National Community Development Service (SNDC), serving first in the Division for Promotion of Rural Woman (1977-1978) and then in the Division of Training (1978-1980), where she worked as an instructor at the Regional Training Center of Totacoa. Upon completing her 14-month assignment with the Traditional Practices Project, Marina married Roberto Ruiz, former Director of the National Community Development Service in Cochabamba. In 1982 Marina participated as a field researcher in evaluating the impact of the Bolivian Food for Development Program (PL480-Title III).

COMMUNITY OF PUCA PUCA

The community of Puca Puca is located in Canton Cercado, Province of Campero, in the Department of Cochabamba. It is located about ten kilometers north of the town of Aiquile and some 220 kilometers southeast of the city of Cochabamba. The access road into Puca Puca is hardly more than a dirt path, which is followed two kilometers west of the highway to Aiquile. The path climbs a gentle slope through thorny brush and algarrobo (carob) trees.

Puca Puca is an ex-hacienda, and most residents owe their properties to the Bolivian Agrarian Reform. The community consists of some 70 families with a total estimated population of about 420 persons. The settlement pattern is rather dispersed, with no clearly-defined community center and dwellings spaced anywhere from 300 meters to three kilometers apart. Since agrarian reform properties were adjudicated in the 1950's, a process of fragmentation and reconsolidation of holdings has occurred. Some families occupy holdings as small as a quarter hectare, others as large as 15 hectares. The average household controls 3-6 hectares of arid, unirrigated land of which no more than half is cultivated in any given year. Puca Puca lies along a long slope that ends in steep mountain ridges at the upper end and the Aiquile River below. Although the river carries water only seasonally, and lies too low to be utilized for irrigation, residents use their low-lying properties for agriculture and their highlands for grazing livestock, mainly goats and cattle. The community also owns communal grazing lands some 20 kilometers to the north, on a mountain overlooking the Mizque River.

The agricultural economy of Puca Puca is strongly oriented to subsistence production, and virtually all marketing of crops is done on a barter basis. The primary crop is corn, which occupies about 80 percent of all cultivated land. The second most important crop is wheat, but plantings seldom exceed a single hectare. These two principal crops are complimented by potatoes, peanuts, tomatoes, garlic, linseed, and barley--all grown in very small plots. It is customary for most families to grow different kinds of squash and gourds amid their fields of corn. Quinua is sometimes grown along field boundaries.

Soil tillaging is conducted exclusively with oxen and wooden plows. In fact, because of its relatively abundant fuelwood and scrub timber resources, Puca Puca is a production center for the making of wooden plows--which are bartered with producers of other regions in exchange for textiles, pottery,

and food not grown in sufficient quantity in Puca Puca. With the exception of harvest tasks, almost all labor requirements are met by family workers or on an exchange labor basis among relatives and neighbors. However, at harvest time many highlanders participate in the picking of corn. They are paid in produce, not cash. Similarly, adult males from Puca Puca often migrate briefly to highland potato harvests, where they work until they have earned enough produce to satisfy family consumption needs. In recent years, considerable off-farm migration to the tropical lowlands has occurred. Adult males travel to the Chapare to participate in the coca and rice harvests, and to Santa Cruz to harvest cotton and sugarcane. Such visits have frequently resulted in permanent abandonment of Puca Puca. Increasingly, young women are leaving their homes to find work as domestic servants in Cochabamba.

Livestock raising is a major productive activity in Puca Puca, but again principally on a subsistence rather than commercial basis. Most families graze several head of cattle on the slopes above the community--at least a pair of draft animals for plowing-- and once the tillaging season is over the cattle are taken to graze in the communal lands near the Mizque River. After cattle, the primary livestock enterprises are goats, sheep, pigs, burros or horses, chickens, and ducks. Animal herds are expanded in good years and bartered away to meet subsistence needs during drought years. A number of animal sub-products are sold for cash income. These include cheese, wool, hides, spun yarn, eggs, and animal manure. Further cash income is generated by such activities as selling firewood, bread making, and the brewing of chicha (grain beer) made from corn or peanuts.

Puca Puca has no public services of any kind--no potable water, no electricity, no telephone or telegraph communications, no health post, and not even its own school. Domestic drinking water is drawn from holding ponds, springs, and a ditch built by self-help community action to collect ground water seepage for human consumption and very limited irrigation of small vegetable crops. For health services, residents are dependent on family remedies and local healers; only as a last resort will a patient be taken to the hospital at Aiquile. Depending on the location of their residence, children attending primary school must walk from 3-10 kilometers each day to attend classes at a school in the neighboring community of Cercado.

Politically, Puca Puca is administered by an Agrarian Syndicate, which in turn is affiliated to an Agrarian Central based at Cercado. With regard to community organizations, Puca Puca has organized a mothers club, soccer team, and a radio school group for adult literacy broadcasts sponsored by the Catholic Church. About 80 percent of the residents of Puca Puca consider themselves to be Catholic; however, the worship of traditional dieties such as the Earth Mother is practically universal. Most traditional religious and civic festival days are celebrated by the residents of Puca Puca--often in conjunction with festivities organized in Aiquile.

A total of 15 men and 15 women from Puca Puca participated in the Traditional Practices Project. Taken together, 17 resident households were represented. A description of their characteristics is presented below.

A PROFILE OF PARTICIPANTS FROM THE COMMUNITY OF PUCA PUCA

SIMON MERIDA, age 46, a resident of Aiquile, served as the supervisor of family record-keeping in Puca Puca. Simón has 8 years of formal schooling and has received additional training in community development an cooperatives. Since 1966 he has served as a field promotor and project supervisor of the National Community Development Service (SNDC). He is married to Mónica Centeno. The couple has six children, ages 7-17.

JUAN DE DIOS BALDERRAMA, 29, and his wife ELSA CRESPO, 23, have 2 and 6 years respectively of formal schooling. The couple has 3 children, ages 2-6. They grow 2.7 has. of corn and another hectare planted to wheat, potatoes, and peanuts. Their livestock include 10 cattle, 9 sheep, 17 goats, 2 pigs, and 6 chickens.

PABLO BALDERRAMA, 50, and VICENTA MONTAÑO, 49, have no formal schooling. They have 11 children, 6 sons and 5 daughters. The family grows 7.3 hectares of corn, and 2 has. more in wheat, potatoes, peanuts, onions, and garlic. Livestock holdings include 20 cattle, 20 sheep, 13 goats, 2 burros, 2 horses, 6 pigs, and 8 chickens.

GENARO SUAREZ, 42, and GREGORIA FERNANDEZ, 44, have 9 children ages 1-22. Genaro received 2 years of school, his wife none. The family grows 7 hectares of corn and 1 ha. planted to wheat, potatoes, and peanuts. The family raises 10 cattle, 10 sheep, 29 goats, 2 burros, 3 pigs, and 10 chickens.

CRISPIN IRIARTE, 39, and CONCEVIDA ROSALES, 33, have four children, ages 1-14. Crispín studied for five years of primary school, his wife one year. The family grows 3.5 hectares of corn, 1.5 has. of wheat, and about 1.3 has. in potatoes, tomatoes, onions, and peanuts. Livestock include 3 cattle, 17 sheep, 18 goats, 3 burros, 9 pigs, and 9 chickens.

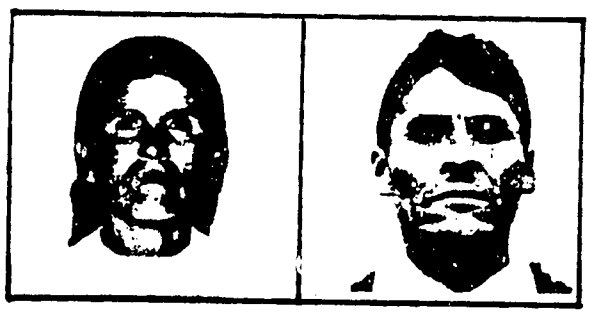
DEMECIO ROSALES, 36, and EMILIA CLAROS, 36, each have four years of schooling. The couple has three children, ages 5-14. Demecio served as Treasurer of the Agrarian Syndicate in 1982. The family grows 5.3 hectares of corn, 1 ha. of wheat, and almost 1 ha. planted to potatoes, peanuts, tomatoes, and others. The family has 22 cattle, 17 sheep, 11 goats, 5 pigs, and 3 chickens.

RENATO ROSALES, 36, and MARTHA MACIAS, 34, have three children ages 5-9. Renato has 3 years of schooling, Martha none. The family cultivates 5.0 has. planted to corn, wheat, potatoes, and peanuts. Livestock include 7 cattle, 24 sheep, 9 goats, 16 pigs, 2 burros, and 15 chickens.

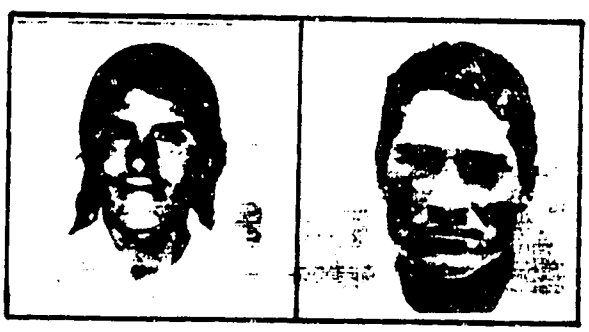
CIRIACO ROSALES, 21, completed secondary school. He lives with his mother, FIDELIA VEIZAGA, 55, and 7 brothers and sisters. Demetria Rosales, 17, keeps her mother's journal. The family grows 6.3 has. of corn, 1.3 of wheat, and 0.5 ha. of potatoes and peanuts. They raise 8 cattle, 24 sheep, 30 goats, 6 pigs, 10 burros, 2 horses, 10 chickens, and 2 ducks.

CONRADO PANOSO, 37, and ALTAGRACIA VILLAROEL, 34, have seven children ages 1-18. Conrado has 3 years of school, Altagracia none. The family grows 3.5 has. planted to corn, wheat, and potatoes. Livestock include 10 sheep, 9 goats, 1 pig, 5 chickens, and 9 ducks.

CIRILO MACIAS, 31, and MIGUELINA ROJAS, 31, have five children, ages 2-10. Cirilo completed two years of primary education and Miguelina three years. They cultivate 2.3 hectares of corn and one-half hectare planted to potatoes, onions, and tomatoes. Their livestock include 5 cattle, 5 sheep, 1 goat, 1 pig, and 2 chickens.

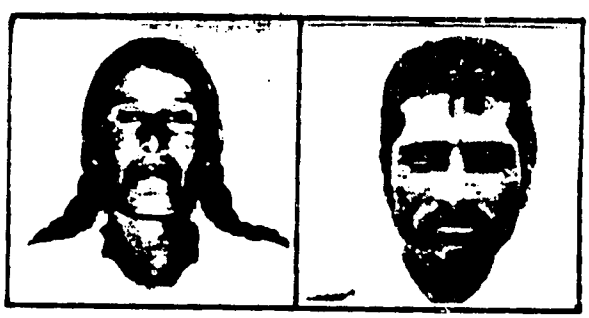


CIRILO VEIZAGA, 52, and FELIPA RODRIGUEZ, 55, have five children, ages 10-23. Only Cirilo received formal schooling and completed three years. Felipa has served as President of the Mothers Club. The family grows 3 ha. of corn, 1 ha. of wheat, and a half-hectare planted to potatoes, peanuts, peas, quinua, and onions. Livestock include 5 cattle, 10 sheep, 14 goats, 2 burros, 1 pig, and 12 chickens.

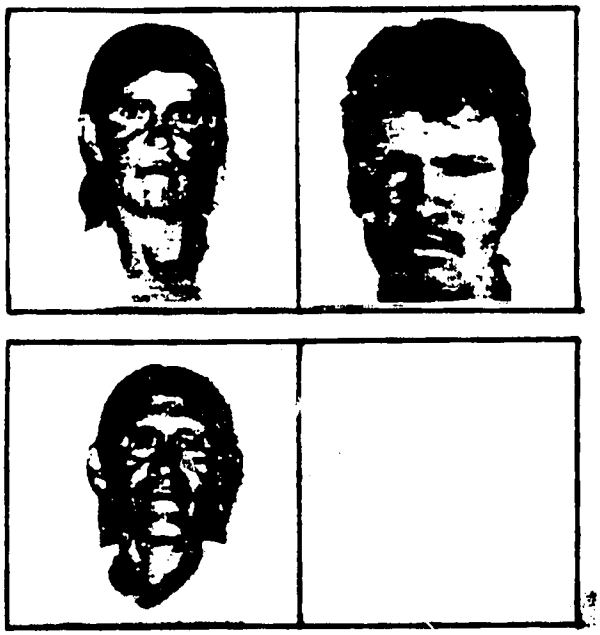


PRIMITIVO HINOJOSA, 30, and EMMA BALDERRAMA, 28, have two children. Primitivo had three years of school while Emma had one. The family grows 3.3 has. planted to corn, wheat, potatoes, and peanuts. Their livestock include 2 cattle, 16 sheep, 5 goats, 1 pig, 2 horses, and 4 chickens.

ALEJANDRO SUAREZ, 27, and SABINA SUAREZ, 35, have three children ages 1-13. Alejandro studied for four years and Sabina for three. The family grows 1.3 has. in corn, 0.8 ha. in wheat, and has two small plots of potatoes and peanuts. Their livestock include 8 cattle, 8 sheep, 10 goats, 2 pigs, and 26 chickens.



HILARION QUIROZ, 44, and BRAULIA SOTO, 36, have seven children, ages 1-20. Neither has any schooling. Their notebooks are kept by an 18 year old daughter, Concebida. The family grows 7.7 has. of corn, 2 has. of wheat, and 1.3 has. in potatoes, peanuts, onions, and tomatoes. They raise 11 cattle, 25 sheep, 20 goats, 5 burros, 2 horses, 7 pigs, and 26 chickens.



MAURICIO MACIAS, 29, lives with his sister TERESA MACIAS, 37, and four other siblings aged 2-17 years. Mauro and Teresa each received two years of school. Teresa is an ex-president of the Mothers Club, Mauricio is a good musician (flute). The family cultivates 1.3 has. of corn and a small plot of potatoes. Their livestock include 4 cattle, 8 sheep, 5 goats, 3 pigs, and 15 chickens.

VIRGILIO MATURANO, 22, lives with his mother DOLORES HINOJOSA, 47, and two sisters. Virgilio has five years of schooling, Dolores none. The family cultivates 3.3 hectares of corn, potatoes, peanuts, and peas. Livestock include 11 sheep, 22 goats, 2 pigs, 2 burros, and 15 chickens.

COMMUNITY OF HUAYCULI

The community of Huayculí belongs to Canton Tarata, Province of Esteban Arce, in the Department of Cochabamba. It is located about 45 kilometers southeast of the city of Cochabamba, almost mid-way between the towns of Cliza and Tarata. Huayculí is a very old community which traces its origins to pre-colonial times. During the last century the community produced several notable politicians and a Catholic bishop; it also acquired a reputation for producing good mule skinners and merchants. But in modern times Huayculí has become a community in decline, effected by significant out-migration to the cities of Cochabamba, Santa Cruz, and La Paz, which in turn is exacerbated by the depressed condition of the local economy since neither agricultural or livestock enterprises offer high potential. In fact, directly or indirectly, most of Huayculí's 67 resident families derive their primary support from pottery making. The ceramics and glazes of Huayculí are recognized in all of the major regional markets of the nation.

As an old settlement located in an arid region, Huayculí was never an hacienda and its lands were totally unaffected by Bolivia's agrarian reform. The land tenure system of the community is that of piquerías or individual small farm properties. The land is generally quite flat. This fact has encouraged local residents to enter into compañia or joint cultivation arrangements by combining their separate properties to facilitate mechanized land tillaging and harvesting operations using rented tractors. Some compañia properties exceed 25 hectares shared by three or more households. There is only one crop--wheat--grown on a large scale, and its productivity is highly variable due to considerable climatic risks of frequent drought and hail storms. The arroyos and streambeds that cross community lands are all dry throughout most of the year; they fill with water for only a few hours or at best a few days following heavy rains. After wheat, therefore, all other crops are cultivated on a very minor scale. These include tiny plots of potatoes, corn, peas, and the fruit of prickly pears growing along field boundaries. Thus, in terms of subsistence, Huayculí is far from agricultural self-sufficiency. It manages to feed itself by trading its wheat surpluses, ceramics, and sometimes its livestock for commodities it can not provide for itself.

The aridity of Huayculí also mitigates against the raising of livestock. Nobody raises oxen, and all land tillage operations are dependent on tractor rental. A few families have a cow. Most households raise a modest flock of sheep, both to provide wool for blankets and other homemade fabrics, and also as a form of savings to finance emergencies. The typical family will also raise a variety of poultry--chickens, ducks, pidgeons--as well

as a few guinea pigs, mainly for family consumption and even then only on special occasions.

Pottery-making remains the principal economic activity of the community. Most families have their own oven and wheel. Those households without these facilities work in compañia with those who do. Men, women, and children participate in pottery tasks, with women playing a particularly important role in the marketing of ceramics. Products are sold in a variety of ways: at the homestead, under contract by ovenfulls or hornadas, at local markets on a wholesale and retail basis, and at seasonal fairs at major market centers throughout Bolivia. Ceramics are often sold for cash, but also it is customary to use them as a barter good to exchange for potatoes, corn, and other food staples. Most pottery-makers in Huayculí participate to some extent in the marketing of their own production. Sometimes the head of household may be absent for weeks at a time on marketing trips to the regional centers.

With regard to community services, Huayculí boasts electricity instalations to 60 percent of local homes. It is connected to the nearest local markets--Tarata and Cliza--by all-weather roads. The community has a primary school covering grades 1-4; there are 3 teachers for an enrollment of 85 students, of which 60 attend regularly. For older students it is necessary to attend school in Tarata which is located 5 kilometers away. Huayculí has a health clinic but no resident health personnel; nor is the facility visited periodically by a physician or nurse auxiliary. For this reason the use of traditional healers remains widespread in Huayculí. In cases of extreme emergency, patients are taken to the nearest hospital in Cliza, 8 kilometers distant. The community has no system of potable water. Most families have wells dug in the vecinity of the homestead. A variety of external institutions have attempted to work in Huayculí, either to promote community development or to improve the quality of ceramics. However, practically all these initiatives failed to meet the expectations they generated, and today residents display indifference or boredom with new development proposals.

Huayculí is administered by a 13-member agrarian syndicate. It also has a canton official (representing the municipality of Tarata) who is responsible for assessing complaints between residents, collecting taxes, and other minor tasks. There exists a school support committee, a soccer club, and a variety of fokloric groups which become active once a year to celebrate Huayculi's patron saint day, October 2nd. Residents of Huayculí consider themselves to be 100 percent Catholic, but with strong mixtures of spirit worship and careful observence of rituals honoring deceased relatives. Local residents observe and celebrate at least a dozen civic and religious festival days.

Twelve male household heads and eleven females participated as record keepers in the Traditional Practices Project. A profile of these participants follows.

A PROFILE OF PARTICIPANTS FROM THE COMMUNITY OF HUAYCULI

DEMETRIO ALVAREZ, 52, and ESTEFANIA VEIZAGA, 48, have four children ages 2-7. Demetrio has four years of primary school, his wife none. A daughter, Juana Alvarez (age 24) serves as scribe for her mother's journal. The family cultivates one hectare planted to wheat, potatoes, corn, and peas. They raise 8 sheep, 2 pigs, and a chicken. Demetrio is an ex-Secretary General of the Agrarian Syndicate.

SEFERINO NOGALES, 70, and CASIMIRA CLAURE, 72, have two sons, both independent. Seferino received four years of schooling, Casimira none. They grow 1.7 hectares planted to wheat, potatoes, and peas. They also raise 6 sheep, 9 chickens, and 4 pigeons. Seferino is the local Corregidor.

JULIO NOGALES, 55, and IRENE FERRUFINO, 57, have seven children, of whom only two (ages 12-21) remain at home. Julio completed four years of school and his wife two years. They cultivate 3.5 has. of wheat, 2 has. of potatoes, and one ha. of corn and peas. They raise 52 sheep, 1 burro, 4 chickens, and 10 pigeons. Julio serves as a cantonal agent.

IGNACIO ANSIETA, 49, and CARMELA ORTUÑO, 55, have four children ages 10-19. Ignacio completed three years of school, Carmela none. A 19 year-old daughter, Alejandrina, keeps her mother's journal. The family cultivates 2 ha. of wheat, 0.75 ha. of corn, and a small plot of potatoes. They raise 1 cow, 11 sheep, 1 pig, 24 ducks, and 16 pigeons.

RODOLFO MERCADO, 74, and ANGELICA ALBA, 71, have two children, both independent. Rodolfo completed six years of primary school, Angelica none. Rodolfo serves as a canton representative and therefore is no longer an active farmer except for a small plot of corn. The family raises 11 sheep, 19 ducks, 11 chickens, and 20 guinea pigs.

JULIO CABALLERO, 45, and PRIMITIVA VEIZAGA, 45, have three children ages 3-8. Neither Julio or Primitiva have any formal schooling. The family grows a tiny plot of wheat in Huayculí, but Julio also has another farm in the Chapare. They raise 7 sheep, 2 pigs, and 6 pigeons.

ANGEL ALBA, 46, and JUANA ALVAREZ, 49, have no children. Only Angel received any schooling, completing five years. The couple grows 2 ha. of wheat and 0.50 ha. of potatoes and corn. Their livestock holdings include 3 sheep, 1 burro, and 5 chickens. Like most Huayculí families, their primary source of income is pottery-making.

CESAR NOGALES, 27, and AMBROSIA PINTO, 25, have two children, ages 3-6. Cesar has seven years of schooling and Ambrosia six years. The family grows 1.5 has. of wheat and 0.75 ha. planted to corn, potatoes, and peas. They also raise 8 sheep and 3 chickens. Pottery-making is the family's main occupation.

OSCAR NOGALES, 31, and TEOFILA ENCINAS, 27, have two children, ages 2 and 6. Oscar completed three years of school, Teofila two years. They cultivate 2.25 has. planted to wheat, corn, and peas. They raise 15 sheep, 25 guinea pigs, and 11 chickens. The family mostly supports itself as potters.

ELIAS RODRIGUEZ, 60, and ANGELICA ORTUÑO, 45, have five children, ages 11-25. Elias studied for two years. Angelica received no schooling. The family grows 1 ha. of wheat and 0.5 ha. planted to potatoes, corn, and peas. Their livestock include 2 cows, 15 sheep, 12 chickens, and 6 pigeons. They work as ceramicists as well.

PATROCINIO ORTUÑO, 55, and FLORENCIA ALBA, 45, have three children ages 5-23. Patrocinio completed two years of primary school and Florencia three. They grow 2 has. of wheat and about 0.5 ha. in corn, potatoes, and peas. Livestock holdings include 1 burro, 6 sheep, 10 chickens, 8 ducks, and 8 pigeons.

ANDREA ALVAREZ, 55, has two children, ages 16-18. She received no schooling. A 16-year-old daughter, Josefina Alvarez, keeps her mother's journal. The family grows about 1/10 hectare in corn and potatoes. Livestock include one burro and 5 guinea pigs. In addition to pottery-making, Andrea is a curandera or traditional healer.

COMMUNITY OF MELGA

The community of Melga belongs to Canton Sacaba, Province of Chapare, in the Department of Cochabamba. It is located about 30 kilometers northeast of the city of Cochabamba, just off the Cochabamba-Chapare paved highway. From the highway the community lands climb for 12 kilometers up a gently sloping valley which eventually broadens out and ends in a cold, windswept plateau situated at about 4,000 meters (13,000 feet) above sea level. Melga is a progressive and growing community which currently has 279 resident families distributed over seven districts and an altitude range of some 1,000 meters (3,250 feet). The community has an additional 177 landless or temporary families, most the descendents of original families.

Melga is an ex-hacienda. The name itself refers to a variable area of land assigned as a task to be completed by a single worker in a day's time. Although unquestionably eligible for expropriation in its entirety by the agrarian reform, Melga was ultimately given the legal definition of medium-scale property, which left the former owner with 102 of the property's 481 cultivable hectares. These choice bottomlands are gradually being sold at the astonishing price of US$6,000 per hectare, which makes them too expensive for purchase by community residents except on a very long-term basis. However, many residents rent these lands from the former owner on a share crop basis pending their eventual sale. The high land price is in part a reflection of the fact that Melga represents some of the highest quality farmland in the Valleys region, not because of its fertility but because the community has access to a permanent source of irrigation water. In addition to the water of several small springs and streams that irrigate different districts of the community, Melga is supplied by a reservoir built through self-help action by the residents themselves, which is located on the plateau above the community. Depending on annual rainfall, the reservoir supplies sufficient water for no less than six and no more than 15 mitas or water turns for irrigation users. This precious resource, combined with the community's many different ecological zones, allows Melga residents to engage in continuous crop production activities throughout the year. Three separate and overlapping crop cycles for potatoes--one rainfed and two irrigated--are possible each year. As a result, Melga is considered one of the major potato production centers in the Valleys region, and its produce has a reputation for both high quality and reliability of supply. After potatoes, the most important commercial crops in Melga are broadbeans, peas, and onions. For on-farm consumption a variety of additional crops are grown including wheat, barley, oats, corn, oca, and papaliza.

Throughout most of the community the use of animal traction for soil tillage remains the norm, and most households raise a pair of oxen for this purpose.

Many families also have a cow, a modest flock of sheep, a burro for transporting fodder and produce, a few poultry, and guinea pigs. Sheep are raised mainly for their byproducts--wool and manure--as well as a form of savings to be liquidated only in case of emergency. Chickens, ducks, and guinea pigs are consumed by the farm household only on special occasions, or sold at markets held on special holidays.

In addition to their income from agriculture and livestock enterprise within Melga proper, many residents also have properties in the Chapare colonization region to which they must travel back and forth periodically. Two waves of Chapare colonization have left from Melga during the last 10-15 years, the first involving 160 colonists and the second 200. Within Melga itself there exists an organization of Chapare colonists. In addition to persuing legalization of property tenure, a major purpose of the group is to coordinate the comings and goings of its members to facilitate exchange labor arrangements not only in the Chapare but also for crops in Melga during the frequent absences of their owners. The production of their Chapare properties provide Melga residents with abundant supplies of rice, corn, and fruit crops.

Melga is a very commercially-oriented community. Produce marketing is a function dominated by women, who learn to buy and sell from a very early age. Harvested produce is sometimes sold on-farm, but normally it is sold on a wholesale basis to rank'eras or intermediaries at a variety of regional markets, and sometimes produce is retailed by the suppliers directly. The principal market outlets are the city of Cochabamba (on wednesdays and saturdays), nearby Sacaba (on sundays), and for livestock sales the tuesday market at Punata. It is customary for Melga residents to sell produce to intermediaries who are members of their extended families, and frequently crops are grown in compañia with intermediaries providing seed, fertilizer, and other inputs in exchange for a portion (usually half) of the harvest.

From the viewpoint of community development, Melga is far above the norm for the Valleys region. It has a paved highway linking it to local markets and a constant supply of transport services (at least hourly during the day). The different zones and altitudes of Melga are linked by a good network of all-weather paths and access roads. Most of the residents have electricity, potable water, latrines, and own a comfortable home constructed under the auspices of Melga's housing cooperative. The community has a health clinic and a resident nurse. Improved childcare practices are promoted through a mothers club. Many households receive bank credit to finance modernized agricultural practices, several enjoy crop insurance, and farm extension agents visit the community frequently. Melga has an exceptional educational infrastructure consisting of a nuclear school center with grades 1-9 plus four sectional schools with grades 1-4. The combined enrollment is 332 students serviced by 23 teachers. Politically, Melga is administered by an agrarian syndicate and a corregidor or cantonal agent. It also has an association of potato producers, a consumer cooperative, several soccer teams, and a variety of folkloric groups. Virtually all residents are Catholics, but with strong mixtures of spirit worship.

A PROFILE OF PARTICIPANTS FROM THE COMMUNITY OF MELGA

HERMOGENES ROJAS, 46, and DELFINA ACOSTA, 32, have two children ages 8 and 10. Hermogenes completed five years of primary school while Delfina completed two years. The family farms 8.25 hectares planted to potatoes (3 has.), barley (1 ha.), oats (0.5 ha.), tarwi (0.5 ha.) and habas (0.25 ha.). They raise 8 cattle, 30 sheep, 2 pigs, 26 guinea pigs, and 8 chickens.

MARCOS CASTRO MERINO, 49, and LIBORIA SANCHEZ, 45, have five children ages 9-20. They grow 1.25 has. of potatoes, 1.5 ha. of barley, wheat, and oats, and 0.25 ha. each of tarwi and peas. Livestock include 5 cattle, 30 sheep, 2 burros, 2 pigs, 5 chickens, and 4 ducks.

FELIX BALDERRAMA, 36, lost his wife and a daughter in 1980. A sister, MACEDONIA BALDERRAMA, 19, keeps a journal too. Felix completed four years of school and Macedonia three years. The family grows 1.5 ha. of potatoes, 0.3 ha. of wheat and barley, 0.25 of habas, and minor plots of corn, oca, and peas. They raise 3 cattle, 38 sheep, 2 pigs, 1 burro, 8 guinea pigs, and 15 chickens.

VALENTIN TRUJILLO ROJAS, 31, and JULIANA OLIVERA, 31, have four children ages 2-8. The family grows 1.0 [illegible] planted to potatoes, wheat, barley, and habas. Livestock include 1 cow, 12 sheep, 7 pigs, 1 guinea pig, and 2 chickens. Valentín serves as treasurer of the Pro-Electrification Committee.

BAUTISTA VALENCIA, 38, and LUCIA SANCHEZ, 26, have a daughter, age 7. Bautista completed five years of school, Lucia four years. The family has 3 has. of land, of which half is planted each year to potatoes, wheat, corn, habas, and onions. They raise 5 cattle, 22 sheep, one pig, one burro, one horse, and 15 chickens.

ARTURO ROJAS, 42, and EVANGELINA ACOSTA, 41, have five children ages 2-12. Arturo completed five years of primary school, Evangelina none. A daughter, Lidia (age 16), keeps her mother's journal. The family has 3.4 hectares and each year plants about 2.25 has. to potatoes, barley, habas, ocas, and onions. They raise 6 cattle, 12 sheep, 3 pigs, 8 chickens, and 5 ducks.

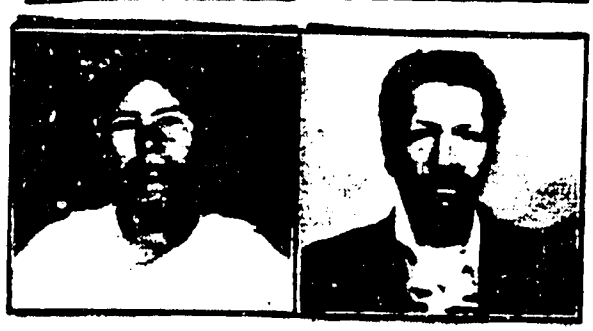
JULIO VALENCIA,36, and MERCEDES OLIVERA, 29, have three children ages 7-12. Julio completed seven years of school and Mercedes three years. They grow 1.3 hectares planted to potatoes, wheat, oats, habas, and oca. They raise 2 cattle, 15 sheep, 1 burro, and 8 poultry. Julio has served as Secretary General of the Agrarian Syndicate.

GERMAN ACOSTA and VALENTINA DIAZ, both 32, have four children ages 6-14. German completed four years of school and Valentina three. They grow 1.1 hectares of potatoes, corn, habas, and onions. They raise 5 cattle, 24 sheep, 7 chickens, and 20 guinea pigs. German is also an ex-Secretary General.

EUSEBIO CASTRO, 63, is a widower with three children ages 26-33. His daughter Aquilina, with seven years of school, keeps her own and her father's journal. The family plants 1.75 has. of potatoes, wheat, habas, oats, and barley. They raise 4 cattle, 10 sheep, 1 horse, 2 pigs, and 8 chickens.

LEONCIO TRUJILLO, 32, and MARGARITA ESPINOZA, 31, have two children ages 5 and 8. Leoncio completed three years of school and Margarita two years. The family has four hectares of land, of which half is cultivated each year in potatoes, wheat, oats, corn, habas, and onions. They raise 2 cattle, 5 sheep, 1 burro, 35 guinea pigs, and 2 chickens.

VALERIO BALDERRAMA, 40, and FORTUNATA ACOSTA, 38, have seven children ages 2-17. Valerio completed three years of school, Fortunata two. A daughter, Beatriz (14), keeps her mother's notebook. The family farms 3.5 has. planted to potatoes, wheat, barley, and oats. They raise 6 cattle, 30 sheep, 1 burro, 20 guinea pigs, 20 chickens, 2 ducks.



FLORENCIO VALENCIA, 41, and JUANA GOMEZ, 44, have eight children ages 5-20. Florencio completed three years of school, Juana none. A daughter, Constancia (21), keeps her mother's notebook. The family grows 1.5 has. of potatoes, barley, wheat, and oca. They raise 4 cattle, 35 sheep, 1 burro, 1 pig, 2 chicjens, and 9 ducks.

RAUL ROJAS, 25, lives with his mother, an older sister, LUCRECIA ROJAS, 40, and a younger sister, Jovita (16) who keeps Lucrecia's notebook. The family grows 2.5 has. planted to potatoes, barley, oats, and onions. They raise 4 cattle, 30 sheep, 20 guinea pigs, 5 chickens, and 4 ducks. Raúl has served as a supervisor of community records.

CHAPTER II.

GENERAL ASPECTS OF AGRICULTURAL ACTIVITY

This chapter seeks to give the reader an overview of many different topics which relate to agricultural activity in the Valleys region, but which do not conveniently fit into descriptions of specific crops.

We first describe the most common farming tools used by rural households participating in the Traditional Practices Project, with primary emphasis on plowing and hand-cultivation tools. Next is covered the important task of procurement and preparation of manure supplies. The middle sections of the chapter are devoted to calendars of crop tasks and crop risks. These are described on an individual community basis, and one month at a time. Closely related to the agricultural and risk calendars is the whole topic of how rural households predict the weather and estimate their harvest prospects. Irrigation arrangements and a description of different ways farmers recruit non-family labor are summarized.

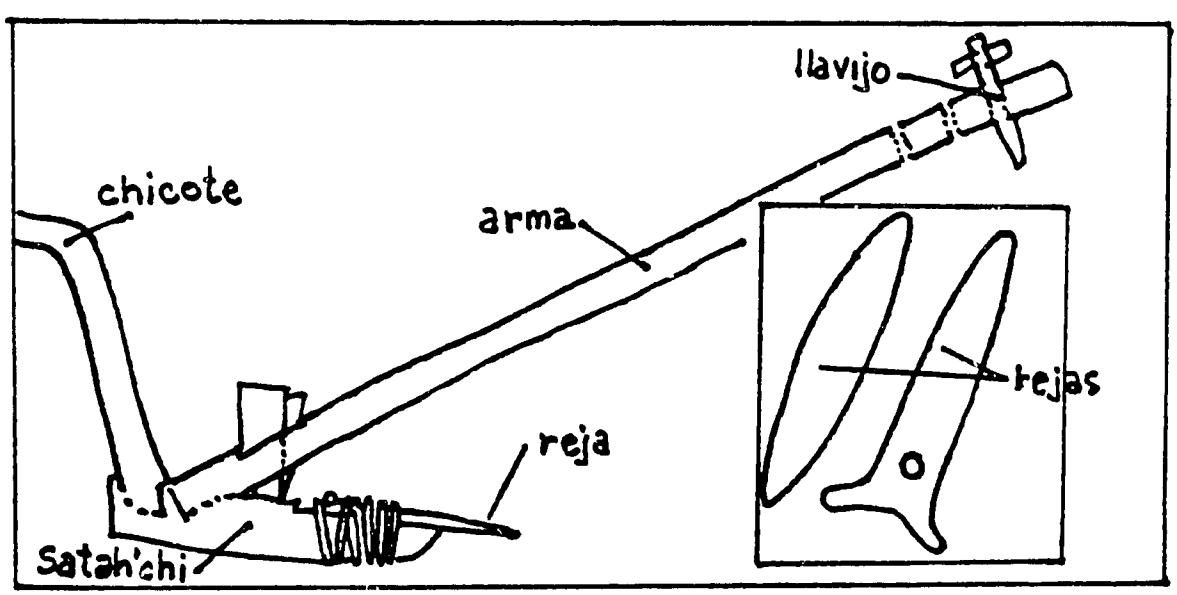
The chapter concludes with three sections concerning the off-farm activities of rural households. Different means of rural transportation are described, including how travelers must prepare for long trips. A map of weekly markets visited by Project participants is presented, along with a general description of the markets themselves. We conclude with a section describing weights and measures used by farm households in the Valleys region.

FARMING TOOLS

THE OX-DRAWN WOODEN PLOW

For farmers in Melga and Puca Puca, the arado or wooden plow--together with its yoke--is the most expensive and important tool required for agricultural activity. The wooden plow is required for all land tillaging operations, for furrowing and burying the seed at planting time, for cutting drainage ditches across planted fields (for irrigated crops), and for certain cultivation tasks--particularly hilling--when crops are at an early stage of growth.

The plow consists of several parts: (1) the plowshoe or satah'chi, usually hewn by the farmer himself from algarrobo (carob) wood; (2) the plow handle or chicote; (3) the plowblade or reja, made from a truck leafspring and pointed at one or both ends; (4) a leather strap for binding the plowblade to the plowshoe; (5) the plowstem or arma which connects the plow to the yoke; (6) a wooden linchpin or llavijo which holds the plowstem in place below the yoke; and (7) a set of wooden stakes or braces which pass through the plowstem and into the plowshoe, allowing the farmer to adjust the plowing angle to the height of his oxen.

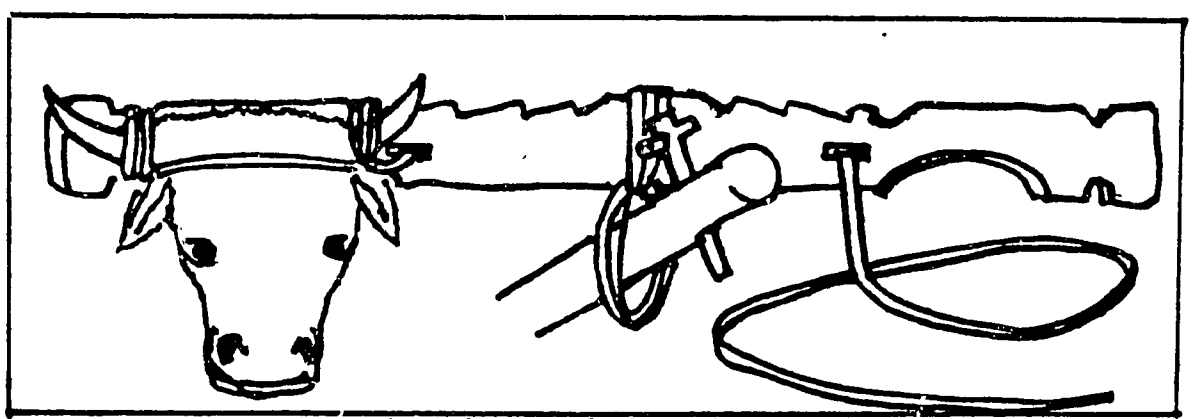


Components of the Wooden Plowset

Several farmers in Puca Puca construct their own plowsets, both for personal use and for barter. Plowblades are purchased at weekly markets and repaired by local blacsmiths. A single blade sold for about 100 pesos (US$4) in 1981, the wooden components of the plowset (excluding yoke) for about 500-600 pesos (US$20-24). The average family has 2-3 plowsets and half a dozen plowshares, representing an investment of 1,500 to 2,000 pesos (US$60-80).

THE WOODEN YOKE

The typical family has at least two wooden yokes or yugos: one for normal tillaging or the heavier plowing tasks which is about two meters in length, and a narrower yoke--the aysa yugo--for furrowing and hilling tasks. Yokes are carved from a single piece of wood. A single yoke cost 150-200 pesos (US$6-8) in 1981. Its use requires three leather straps--two for attaching the yoke ends to the horns of each draft animal, and one providing a leather ring for attachment of the plowstem.

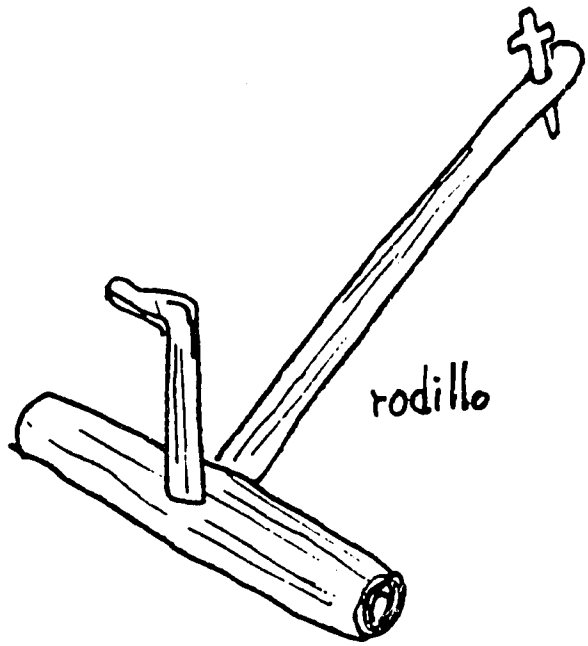


Attachment of the Yoke

• The strap for attaching the yoke to the horns of each animal needs to be at least three meters long. The strap passes several times around each horn, then across the animal's forehead to be wrapped around the other horn. The strap is never attached around the underside of the ox's head.

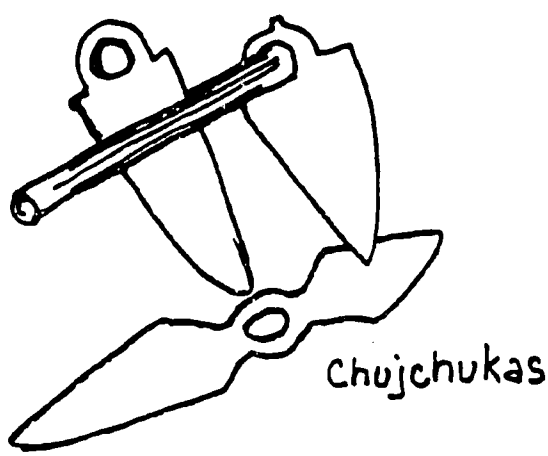
THE WOODEN ROLLER

Farmers in Melga use a wooden roller called the rodillo to level the soil surface after land preparation or planting activities. It is pulled by a team of oxen and therefore attaches to the yoke by means of a wooden stem similar to that of the plow. The roller itself is about two meters wide. It has a vertical handle which allows the plowman to steer the device or even to ride on top of it to give more weight to the roller. Soil leveling is more important in Melga because it engages in irrigated agriculture, and an even, compacted soil surface assists in a more efficient distribution of water.



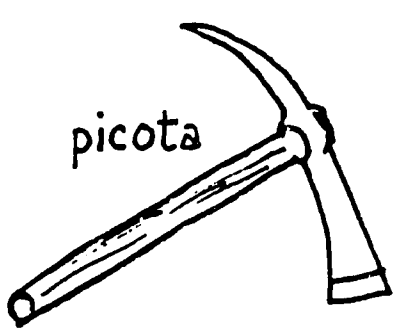
THE DIGGING HOE

The most widely-used digging tool in the Valles region is the chujchuka. It is also called huaca kallu, meaning ox tongue. It is used principally in hilling and irrigation tasks, and is also the tool of preference for the harvesting of root crops such as potatoes and oca. The chujchuka blade is factory-made and can be purchased in weekly markets. The farmer provides his or her own wooden handle. There are a variety of blade shapes and models for the chujchuka. The cost of the tool ran 75-100 pesos (US$3-4) in 1981. The typical farm family has a half dozen of these implements.

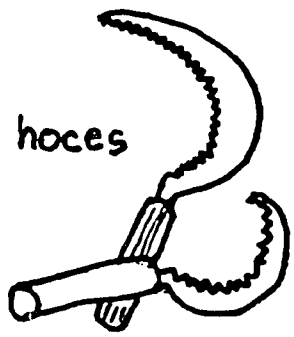


THE PICK AXE

The pick-axe or picota is mainly used for removal of stones and for weeding tasks in which it is necessary to remove the deep roots of certain grasses. The tool is often used as well for clearing furrows and guiding water during irrigations.

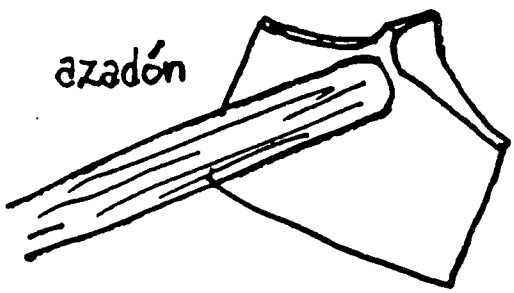


SICKLES



The sickle or hoz is primarily used for the reaping of cereal crops--particularly wheat, barley, oats, and corn--as well as the cutting of leguminous crops, like peas and habas, which are left to field dry and be harvested as grain. Sickles are also used for cutting fodder for livestock. The tool comes in assorted sizes and shapes. In 1981 sickles sold in local markets for 100-150 pesos (US$4-6). The average farm household needs about four of these implements.

THE COMMON HOE



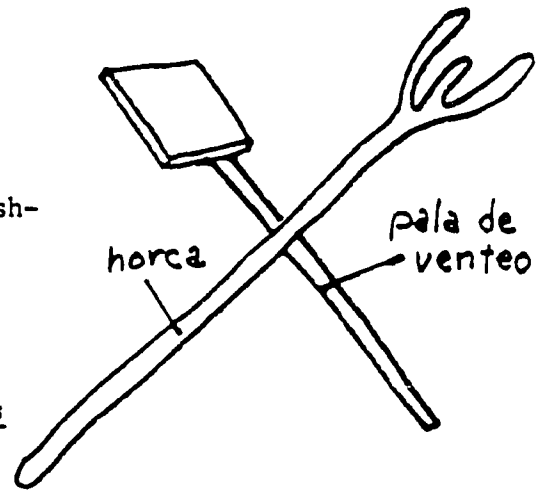
In Huayculí more than the other communities the common hoe or azadón is used for many cutting tasks in place of the sickle. It is also the implement of preference for hilling and the construction of bateas (shallow holes) for detaining water within furrows. A hoe blade, depending on on its size, sold for 150-180 pesos (US$6-7.20) in 1981.

SPRAYER

Although still fairly rare in Puca Puca and Huayculí, sprayers have become common for farmers in Melga, where potato cultivation is continuous and insect pests are reported to be increasing. The sprayers are used to apply liquid insecticides as well as leaf fertilizer at flowering stage. Aside from potatoes, onions, habas, and oca, fumigation of grain crops has also become fairly common.

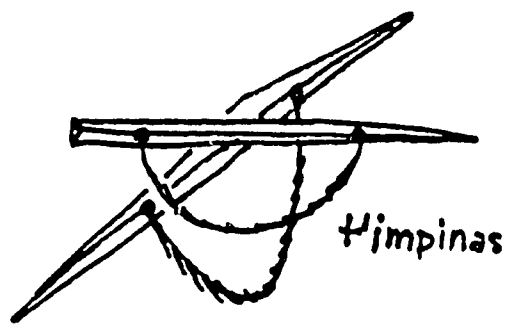
THRESHING AND WINNOWING TOOLS

For threshing of grain crops, farmers use a wooden pitchfork known as the jorca to toss the stems from the outside edges into the center of the threshing floor, where the grain is to be trampled by animals or--in the case of Huayculí--crushed under the wheels of a tractor. Once wheat grain has been separated from the stems, it is tossed in the air with wooden shovels or palas so that the wind will blow away the chaff.



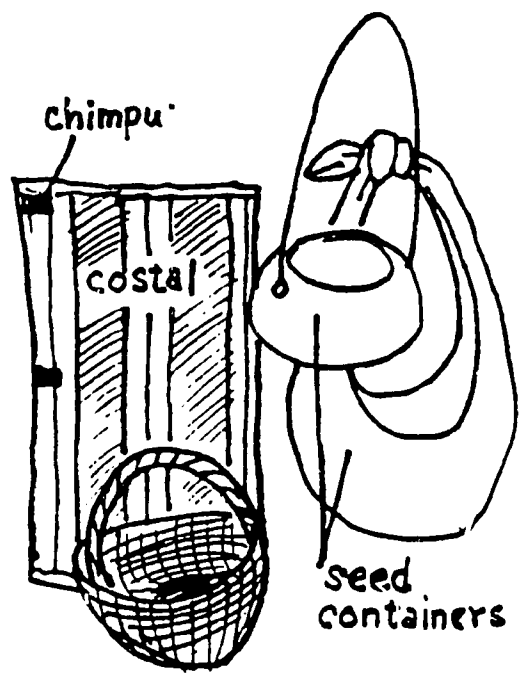
CORN HUSKING NEEDLES

When ears of corn are husked, farmers prefer to use wooden needles or stakes known as t'ipinas for punching through to the kernals and ripping away the outer layers of husk. T'ipinas usually have a piece of cord attached to the handle to support the tool. They are sometimes double-pointed.



CARGO SACKS, BASKETS, AND OTHER CONTAINERS

The large cargo sacks or costales are woven from spun wool and come in several sizes. When accompanied by a volume marking stitched in a different color--indicating a half-load and full-load--these are called chimpus. Straw baskets are commonly used for collecting harvested produce for most tuber and legume crops. The rural household also makes use of gourds and cloth sacks for seed containers during planting. Ground cloths for collecting and selecting harvested produce, or for carrying bulky loads of grain and fodder, are common.



PROCUREMENT AND PREPARATION OF MANURE

Among participants of the Traditional Practices Project from the Valleys region, the direct application of animal and chemical fertilizers is predominantly restricted to potatoes. This emphasis by no means should be interpreted as an indicator that farmers are ignorant of the nutritional needs of their other crops. To the contrary, potatoes are simply seen as the crop that requires the most direct nourishment, first because it is a heavy nutrient consumer in its own right, and second because it is often the first crop in a cycle covering other crops. A heavy first-year fertilizer investment in a given field creates what farmers call an "improved soil", which in turn is expected to generate continuing (although declining) nutritional benefits over a period of several years. Direct fertilization of crops other than potatoes will occur, but only if such crops are being planted in an unimproved soil.

As one of the principal potato producing communities in the region--characterized by continuous and intensive potato cropping the entire year--Melga's farmers have much larger fertilizer requirements than most. In addition to depending on the manure supplies of their own livestock, residents of Melga buy large amounts of nutrients from outside the community. There appear to be two options available: (1) purchase of chemical fertilizers to supplement inadequate manure supplies produced on-farm, or (2) purchase of additional manure in place of chemical fertilizers. Either way, Melga provides a good case study of how rural households obtain and use fertilizers.

TYPES AND SOURCES OF FERTILIZER

Farmers from Melga purchase three types of manure from outside the community. The first is cattle manure, which cost 2,000 pesos (US$80) per 5,000 pound truckload in late 1981. The second is sheep manure, obtained at 3,000 pesos (US$120) per truckload. Finally, there is chicken manure, which was selling at this time for 4,600 pesos (US$184). Some farmers purchase a mixture of cattle and sheep manure for 2,500 pesos (US$100) per truckload. These prices reflect the relative potency of the different fertilizers. Sheep manure is considered about one and a half times stronger than cattle manure, while chicken manure is considered more than twice as strong. To the above prices must be added 1,000 peos (US$40) for the cost of transporting a truckload of manure from the supplier's location back to Melga.

With regard to chemical fertilizers, there are two basic formulas being used in Melga. The first is 18-46-0, which cost 850 pesos (US$34) per quintal (100 pounds), and the other was 16-20-20 at 600 pesos (US$24) per quintal.

FERTILIZER MIXTURES

Farmers who use chicken manure usually use no other kind of fertilizer, but they must acquire it outside the community. The application rate per hectare is considered to be one truckload per hectare. Including transportation charges, the chicken-manure alternative would cost roughly 5,600 pesos (US$184) per hectare planted.

Seldom is pure sheep manure or pure cattle manure used. The normal case is to mix them in roughly equal proportions and then add chemical fertilizer. For a hectare of land it is customary to apply 50 quintals (5,000 pounds) of mixed cattle-sheep manure plus six quintals of 16-20-20 or four quintals of 18-46-0. The total estimated cost of such a mixture would be roughly 7,000 to 7,200 pesos (US$280-288) per hectare, making this option at least 1,400 pesos (US$56) more expensive than the use of chicken manure. However, most Melga farmers who use this second option buy sheep and/or cattle manure to supplement their own stocks. Therefore, as long as the farmer's own livestock can provide more than 28 quintals of manure, the latter alternative becomes absolutely cheaper from the point of view of cash outlays.

PREPARING THE MANURE FOR PLANTING

The chemical fertilizer is applied separately from the manure at planting time, so there are no important preparations required. The manure, on the other hand, requires pre-mixing prior to its transport to the field. When local manure stocks are involved, these are collected from the corrals about every three months and piled at one location. Depending on whether there are one, two, or three potato plantings per year, the accumulated manure will be allowed to dry for periods ranging from about four to twelve months. Manure left longer than a year quickly loses its potency.

Prior to transport to the planting site, the manure should be dug up, beaten, and pulverized as finely as possible. Next, the manure should be piled again and soaked moderately with water to make it humid. The contents of the pile are turned over and over by hand to distribute the dampness throughout. The watering of the manure pile is usually done about 4-5 days before planting. Damp manure is reputed to have a much stronger effect in promoting the rapid germination of the seed. After a day or two of "curing", the moistened manure is loaded into cargo sacks and transported to the planting site. (For manure application descriptions, see Chapter III, Specific Crops: POTATOES).

CALENDAR OF CROP TASKS

In this section are presented the very different cropping calendars of Melga, on the one hand, and those of Puca Puca and Huayculí on the other. These latter communities have farming schedules that follow the traditional pattern of rainfed agriculture, with plantings beginning in November-December at the start of the rainy season, with crops harvested five to six months later, and with a pronounced slack season from August through October. In contrast, the agricultural calendar of Melga displays exceptionally intense farming activity throughout the year, which is due to the combination of the rainfed cropping season with two overlapping seasons of irrigated crops. Melga's reservoir and river water resources provide sufficient supplies to support irrigation from April through November. The miskha grande or early (irrigated) season extends from April through August. The chaupi miskha or middle (irrigated) season extends from June-July through December-January. Finally there is the jatún tarpuy or rainfed crop season which extends from October-November through April.

COMMUNITY OF MELGA

Melga's four principal commercial crops--potatoes, habas, peas, and onions --are generally grown in at least two of the three seasons, which makes for almost continuous planting and harvesting tasks. Potatoes are planted during seven months of the year and harvested in 11 out of 12 months. Habas (broadbeans) are planted during eight months and harvested over nine months. Peas are also harvested nine months of the year even though plantings are limited to four months. Onions are planted during eight months and harvested over ten months of the year.

The root crop of oca (grown on a small scale) as well as all of Melga's grain crops--corn, wheat, barley, and oats--are mostly grown during the rainfed cropping season, with plantings predominantly concentrated around the beginning of the calendar year.

JANUARY

Potatoes: During January the rainfed potato crops have reached flowering stage and require fumigation. Meanwhile, the chaupi miskha crop is near maturity and ready either for the corte de aylinco (pre-harvest cutting of stalks) or the digging itself. Habas: The rainfed broadbean crop is in full flower and requires fumigation; the chaupi miskha crop can begin to be harvested (green) to take advantage of high market prices. Peas are in full

harvest during January, and intensive bird-watching is required to reduce losses in the field. Onions: January is an ideal month for starting onion nurseries because of the (usually) abundant rainfall this time of year; otherwise, onion plots will be found at almost all the different production stages--transplanting, weeding, hilling, and harvesting. The oca and corn crops, both planted in September, should be hilled at this time if this has not been done before. January finds farm households in the midst of their planting of wheat, barley, and oats.

FEBRUARY

Potatoes: Fumigations of the rainfed crop continue, while farm families quicken their harvesting of the chaupi miskha crop to take advantage of the favorable market prices existing around Carnival celebrations. Plots of recently-harvested potatoes may now be planted to habas and onions. Meanwhile, the harvesting of green habas continues; different plots of onions are being transplanted, weeded, and harvested. The harvesting of peas continues. Planting of barley and oats continues. There are no task activities at this time for oca, corn, or wheat.

MARCH

Potatoes: As the chaupi miskha harvest concludes, the barbecho (first tillages) for the next rainfed crops begins. This is also the time to begin gathering manure supplies for the start of the irrigated crop season beginning in April. Habas: For different broadbean plots, land preparation, planting, and hilling tasks can be observed. Peas: harvesting continues. Onions: transplanting, weedings, and hills are observed. Wheat and Corn: weedings and limited fumigations are observed. There are no task activities at this time for oca, corn, and oats.

APRIL

Potatoes: April marks the start of the miskha grande season, with land tillage, manure preparation, and planting tasks occuring at this time. Simultaneously, the rainfed potato harvest begins, with farmers seeking to market produce for Holy Week celebrations. Habas: The harvest of the (green) rainfed crop begins, while plots planted in February-March must now be hilled and fumigated. Onions: weedings and hillings are observed. Oca: the cutting of plant stalks and the beginning of harvesting takes place at this time. Corn, wheat, and oats: the cutting and stacking of these grain crops begins. The only crops showing a lull in activities are peas and barley. April marks the beginning of a period of heavy demand for farm labor, the heaviest of the year, as the harvest season for rainfed crops has arrived throughout the region.

MAY

Potatoes: The harvest of the rainfed crop continues; land preparation and planting of the miskha grande crops continue, with irrigations becoming very frequent. Habas: the green haba harvest continues. Peas: the last of the rainfed pea crop is harvested. Onions: irrigation of young onion crops is continuous, while other crops are being harvested. Oca: the harvest is concluded. Corn, wheat, barley, and oats: all grain crops are being harvested and stacked in May.

JUNE

Potatoes: June marks the height of the frost season, and farm families hurry to complete their harvest of rainfed potatoes so that these can be selected and the chuño quality produce set aside for freezing and dehydration in the highland zone of the community. Meanwhile, barbechos continue for the future rainfed potato crops, the planting of the miskha grande crop continues, and irrigation and hilling of earlier miskha plantings intensify. Habas: the harvest of the rainfed crop continues, but now the grain is dry and will have to be threshed; the planting of miskha habas continues. Peas: plantings are observed. Onions: irrigations and harvesting are observed. No activities with oca are observed since the harvest is now concluded. Corn: the ears are being gathered from the dried piles of stalks. Wheat and barley are being reaped and threshed at this time. Oats are continuing to be cut and stacked.

JULY

Potatoes: The harvesting of the rainfed crop is concluded. Irrigations and hillings for the miskha grande crop continue. Land preparation, manure preparation, and planting tasks are observed as the chaupi miskha season gets underway. Habas: The harvesting and threshing of dry habas continues while the planting of the chaupi miskha crop begins. Peas: planting tasks are observed, and harvesting and threshing of dry peas continues. Onions: the harvesting of some plots continues; nursery preparations begin. Oca: no activity. Corn: irrigation for soil preparation and planting of the following rainfed crop can be observed. Wheat, barley, and oats: reaping and threshing of these grain crops continue. July and August are months of intensified wind, so the winnowing of grain crops largely takes place at this time of year.

AUGUST

Potatoes: Fumigation, irrigation, weedings, and hillings of the miskha grande crop continue, while final plantings of the chaupi miskha crop are observed. Habas: The harvesting, threshing, and winnowing of dry habas continues; land preparation, planting, and irrigations of the chaupi miskha crop continue. Peas: the first harvesting of miskha grande plantings begins. Onions: harvesting and nursery cultivation activities are both

AUGUST (Continued)

observed. Oca: land preparation and early planting of the rainfed crop begin. Corn: pre-planting irrigations, land preparation, and planting of the rainfed crop continue. Wheat, barley, and oats: the threshing and winnowing of these crops is concluded.

SEPTEMBER

Potatoes: The harvest of the miskha grande crop begins, taking advantage of rising market prices as existing stocks of fresh potatoes are becoming scarce. Fumigations, irrigations, and hillings of the plots planted in June and July are intensified. Land tillaging and manure preparation tasks for the rainfed crop are observed. Habas: While the threshing and winnowing of the dry grain concludes, hillings, weedings, and fumigations occur on plots of miskha grande or chaupi miskha plantings. Peas: plantings are observed. Onions: nursery preparation, transplanting, irrigations, weeding, and harvesting tasks are all observed over a variety of different plots. Oca: planting of this crop concludes. Corn: all plantings are concluded by the end of September. Wheat, barley, and oats: no activities with these crops.

OCTOBER

Potatoes: Harvesting of the miskha grande crop continues, with marketing of produce coordinated with the local celebration of Melga's Patron Saint (October 18) and All Souls Day (November 1). Irrigations, hillings, and fumigations observed on early chaupi miskha plantings are observed. The first plantings of the rainfed potato crop begin. Habas: the harvesting is concluded, but land preparation and planing for the rainfed crop begin, while hillings and fumigations of the chaupi miskha crop continue. Peas: the first harvesting of miskha plantings begins. Onions: transplanting, weeding, and harvesting tasks are observed. Oca: no activity. Corn, wheat, barley, and oats: no activity.

NOVEMBER

Potatoes: The planting of the rainfed crop enters its second month; meanwhile, the harvest of the miskha grande crop continues, while irrigations, hillings, weedings, and fumigations of chaupi miskha plantings intensify. Habas: irrigations, hillings, weedings, and fumigations are observed. Peas: the harvest of chaupi miskha plantings continues. Onions: transplanting, weeding, and harvesting tasks continue. Oca: irrigations, hillings, and weedings of this crop are observed. Corn: the first hillings and weedings are conducted. Wheat and barley: no activity. Oats: the first plantings are observed.

DECEMBER

Potatoes: The harvest of the miskha grande crop is concluded, fumigations and hillings of the chaupi miskha crop continue, and first hillings of the rainfed crop are conducted. Habas: more rainfed plantings are observed, while hillings and fumigations on chaupi miskha crops continue. The first harvesting of green habas begins. Peas: new plantings and continued harvesting of existing crops are observed. Onions: as with previous months, the crop will be found in practically all stages of production among different plots--from planting to harvest. Oca: hillings and weedings are observed. Corn: hillings and weedings continue. Wheat, barley, and oats: land preparation and planting of the rainfed crop begins once again.

COMMUNITY OF PUCA PUCA

The principal crops of Puca Puca are corn, wheat, potatoes, and peanuts. The first crop to be planted is usually potatoes, starting as early as October (provided the rains arrive), followed by corn and peanut plantings in November-December. Normally, wheat is not planted until January. Similarly, the first crop to be harvested are potatoes, beginning as early as February and almost two months in advance of other crops. Corn, wheat, and peanuts are all harvested in the May-June period, with threshing and winnowing tasks extending through August in the case of wheat. Because the agricultural calendar is so dependent on the arrival of the rainy season, we will describe that calendar starting with the month of October.

OCTOBER

Potatoes: October is a time for gathering and preparing animal manure. With the arrival of the first rainfall, land preparation and planting tasks are conducted. Other Crops: no activity.

NOVEMBER

Potatoes: If the rains are delayed, manure preparation, land tillage, and planting tasks for potatoes will occur in November. Corn: land preparation and planting tasks begin; also, when the arrival of the rainy season is assured, many households make due allowance for their seed requirements and then begin to sell remaining grain surpluses to take advantage of favorable market prices that exist at year's end. Peanuts: this crop will also be planted as early as November, but in relatively small extensions. Wheat: no activity.

DECEMBER

Potatoes: If the rains are delayed until December, this is the last month in which the crop will be planted. For existing plantings, this month is a time of weeding. Corn: Land preparation and planting begins (if rainy season delayed), while weedings begin for existing plantings. Peanuts: plantings begin or continue. Wheat: land preparations for January plantings may begin at this time.

JANUARY

Potatoes: This is a month of weedings, hillings, and the first fumigation of October or November plantings. Corn: Land preparation and planting continues, combined with replanting if necessary. Weedings and hillings are conducted on earlier planting. Fences are repaired and strengthened to protect plantings from unsupervised grazing animals. Peanuts: weedings and hillings are observed. Wheat: land preparation and planting is initiated and concluded during the month.

FEBRUARY

Potatoes: Hillings and fumigations continue, and the first digging of fresh produce begins. Corn: Replanting, weeding, hilling, and fence maintenence activities are conducted. Peanuts: weedings continue. Wheat: weedings begin.

MARCH

Potatoes: The digging continues, and selection and storage tasks accompany the harvesting. Corn: weedings continue. Peanuts: no activities. Wheat: weedings continue, some fumigation is observed.

APRIL

Potatoes: The harvest, selection, and storage of potatoes is completed. Corn: no activity. Peanuts: no activity. Wheat: weedings are observed.

MAY

Corn: The crop is cut and stacked, left to further dry, and possibly by the end of the month the harvesting of the ears begins. Part of the cut stalks are placed in tree storage for future use as livestock silage. Peanuts: The digging of the crop begins, with harvested produce left to sun-dry several days before storage or sale. Wheat: The crop is cut and stacked. Potatoes: no activity.

JUNE

Corn: The cutting, stacking, and ear harvesting of corn continues. All stalk residues intended for future livestock forrage needs must be placed in tree storage by this month, which is when farm households turn loose their cattle, sheep, goats, and other livestock to graze in the recently-harvested crop lots. In June the producer will market a portion of the harvested surplus, the balance to be sold after the arrival of the following rainy season. Peanuts: The harvesting, drying, and storage of the crop is concluded, but marketing of surpluses will be delayed until August. Wheat: The harvesting and threshing of wheat continues. Potatoes: no activity.

JULY

Corn: Selection and storage of ears is concluded. Ears destined for seed or eventual future sale are kept unhusked, while corn for family consumption and immediate sale is husked and shelled. Marketing of corn surpluses continues. Wheat: The threshing and winnowing of wheat continues. Peanuts and potatoes: no activity.

AUGUST

Corn: The shelling and marketing of corn is concluded, until after the arrival of the next rainy season. Wheat: The threshing, winnowing, and storage or marketing of wheat is concluded. Peanuts: Marketable surpluses are sold at this time coinciding with higher prices related to holidays celebrated in August (Farmers Day, August 2, and Patriots Day, August 6). Potatoes: no activity. Because August is the beginning of a slack period, a major activity at this time is continued fence repairs. It bears mentioning that the farmers themselves are the principal causes of fence destruction during their conejadas or rabbit hunts.

SEPTEMBER

Potatoes: In the event of a premature arrival of the rainy season, the first rains will be used to prepare the land for future potato plantings. September is also a month for preparing stocks of animal manure. Other Crops: no activity.

COMMUNITY OF HUAYCULI

The crop calendar of Huayculí is quite similar to that of Puca Puca since both are linked to the rainy season. Nonetheless, the relatively larger plantings of the principal crop (wheat), the greater dependence on tractor rental for plowing tasks, and the distractions of the primary economic activity--pottery making--contributes to significant scheduling differences when compared to the crop calendar of Puca Puca.

OCTOBER

Wheat: During this month most producers conclude the marketing of their surplus wheat stocks, if any, from the previous year. Potatoes: Provided the rainy season arrives, October is the first month of potato planting. Accordingly, it is a time for gathering and preparing supplies of animal manure. Corn: no activities.

NOVEMBER

Wheat: no activity. Potatoes: If the rains are late, November is considered the last month for planting pure stands of potatoes; thereafter, potatoes will only be planted in association with another crop, usually corn. Corn: no activity.

DECEMBER

Wheat: The first plantings of wheat occur in December, usually just after Christmas. This is particularly the case with the so-called "larger" seed varieties (longer-gestation). Land preparation for wheat planting is normally done with a tractor, but if ox plows are used the task must begin earlier in the month. Potatoes: December is the time of the first hillings and also weeding. Corn: The land preparation and planting of corn usually begins in the first week of December.

JANUARY

Wheat: Plantings continue throughout the month, particularly of the short-gestation varieties. Potatoes: Weedings continue, if necessary, along with the second hilling. For potato crops planted in October it is time to fumigate. Corn: January is a time of initial weeding and hilling. Replanting is often practiced at this juncture as well.

FEBRUARY

Wheat: Weedings are conducted, if necessary. Potatoes: The second hilling and fumigations are appropriate at this time. Corn: Replanting of January plantings may be needed; otherwise, weedings and hillings are required.

MARCH

A general task conducted in the period March-April is that of the wata barbecho or advanced soil preparation for the forthcoming year's rainfed crops. In Huayculí this task is conducted almost exclusively with rented tractors. It is conducted at this time of year because this is when the tractors are available, and the soil is also reasonably soft because of the moisture received from the rainy season.

Wheat: Weedings, if necessary, are concluded by early March. There are no further tasks required with this crop until harvest in late May or June. Potatoes: The first digging of potatoes begins. Corn: no activity except possibly some weeding (unusually wet years only).

APRIL

The wata barbechos are concluded this month. Wheat: no activity. Potatoes: The digging continues. Corn: The harvest begins with the cutting of plant stalks and their stacking in vertical piles or calchas, where they are left to dry for about a month.

MAY

Wheat: The reaping of wheat begins after mid-May. Normally it proceeds by stages and may last at least two months, first because of the size of the areas planted and secondly because the relative scarcity of labor. Since this is also a busy time for potters, the crop is often reaped by gangs of hired laborers. Potatoes: The digging is concluded. Because of the very limited plantings of this crop, there is no marketing of harvested surpluses; there is even very little classification or specialized storage of produce. Corn: The cutting and stacking of corn is concluded in May, and the task of husking the ears continues throughout the month and into June.

JUNE

Wheat: The reaping continues, slowly by stages using available family labor or else quickly using contracted laborers. Potatoes: no activity. Corn: The husking continues, with intensive sun-drying on roofs or patios to enhance resistence to moths and other pests. As with potatoes, the quantities of harvested produce are insufficient to justify marketing of the grain.

JULY

Wheat: Threshing of the grain begins, using a rented tractor hired among several farmers collectively, with assistance on threshing floor tasks provided cooperatively among group members on an exchange-labor basis or ayni. Potatoes: no activity. Corn: The husking and drying of the grain is concluded.

AUGUST

Wheat: The winnowing of the threshed grain is begun in late August, because for most of the month residents of Huayculí are completely adsorbed in the production of pottery for the annual celebration of the Virgin in the town of Arani (August 24-27). This fair at Arani is the last opportunity in the year for Huayculí potters to barter their ceramics for highland produce such as potatoes, ocas, lisas, and corn. What they are able to obtain through barter at Arani will have to last the family until February of the following year. Potatoes: In the case of early rains, some farmers will begin land preparation for the forthcoming year's rainfed potato crop. Corn: no activity.

SEPTEMBER

Wheat: The winnowing of wheat is concluded, using available family labor. Marketing of harvested surpluses begins, but usually in small quantities on a weekly basis. Potatoes: September is a month for preparation of animal manure for the following crop. Corn: no activity.

CALENDAR OF CROP RISKS

Practically every one of the principal crops grown in Melga, Puca Puca, and Huayculí are exposed to a variety of significant production risks at nearly every stage in the growing season. The weather risks include excess rain, drought, frost, excess wind, and hail. From the animal kingdom, crops are seriously threatened by a wide range of pests: worms, insects, birds, rodents, and unsupervised grazing by farm livestock. Practically every crop also faces its own specialized diseases. Moreover, once crops have been harvested there are still risks to be dealt with during storage. But finally, even if all other risks have been successfully met and an abundant harvest has been achieved, the rural household must still face the highest risk of all: falling prices in the marketplace.

The patterns of risk vary considerably from one community to another. The availability of irrigation water in Melga provides its residents with reasonable protection from drought--the major constraint facing farmers in Puca Puca and Melga. On the other hand, the much higher intensity of agricultural enterprise which Melga's water makes possible also results in more crops, more pests attacking them, more labor and more cash outlays for materials to control them, and ultimately--precisely because of these heavy investments--more storage and marketing risks.

COMMUNITY OF MELGA

With regard to weather risks, the most critical period for Melga's farmers is December to April. During this time the community's reservoir has shut its gates to replenish its supplies (during the rainy season) for the forthcoming irrigation period of April through October. Thus, Melga is not entirely immune to the risk of drought. Furthermore, when farming communities with rainfed agriculture are ending their crop year--at the start of the winter (frost) season--farmers in Melga are just beginning the most intensive period of agricultural activity; thus, Melga has a much higher exposure to frost than anyone else. Meanwhile, Melga's uninterrupted schedule of agricultural enterprise brings it no rest from crop pests, disease, and marketing worries.

JANUARY

Potatoes: January is the midpoint of the jatún tarpuy (rainfed) crop, and the continued normal growth of the tubers largely depends on the regularity of rainfall. If the rain becomes scarce, the crop is likely to suffer from a phenomenon known as kanura in which the young tubers harden at their core and further growth is interrupted. By this month the chaupi miskha (late irrigated) crop is practically ready for harvest, and scarce rainfall will effect it differently. The usual drought-induced problem is caterpillar infestation, including the yaja (yellow worm) and the ch'allu (black worm), which are both treated with external applications of Aldrín.

Habas: Like potatoes, drought will attract caterpillars, particularly the silvi khuru (white and yellow worm) which eats the leaves and dries the plant. Peas: The first three months of the year are considered ideal for the repeated harvesting of green peas; but this crop is considered the "candy" of birds and continuous bird-watching or scarecrow devices are imperative. Onions and Oca: no significant risks at this time of year. Corn: no major risk. Wheat, barley, and oats: January is the planting season for these grain crops, so scarcity of rainfall will cause delayed land preparation and sowing which, in turn, will result in later harvesting and higher risks from frost damage at mid-year.

FEBRUARY

Potatoes: February is typically a very wet month, and the primary risk to the crop is jullu or rotting of the tubers in the ground due to excessive moisture. At this time the bulk of the chaupi miskha potato harvest is marketed and prices can fall sharply. Habas: no risks. Peas: Harvesting continues, by birds and men alike. Onions: February is perhaps the one month when onion crops are most effected by camanchaca, a phenomenon caused by excess moisture (similar to jullu in potatoes) in which the roots and the fruit rot while the plant itself acquires a burned appearance. Oca: This is a time for hilling the crop. The only precaution is to make sure the hilling is done when the soil is very dry; hilling with damp soil is considered a sure invitation to infestation of the crop by earthworms. Furthermore, excess soil moisture can result in the rotting of the tubers, as in potatoes. Corn: no significant risks provided rainfall is fairly normal. If rain has been scarce, some farmers will attempt an irrigation using river water, which at this time of year runs very muddy. Local opinions are sharply divided on whether it is beneficial or harmful to irrigate with muddy river water. On the one hand, some farmers insist that muddy water carries a whole host of contaminating diseases and also causes root rotting. Other farmers insist that muddy water carries a variety of nutrients that stimulate plant growth. Wheat, barley, and oats: no significant risks in February.

MARCH

Potatoes: Drought becomes once more the major risk facing the rainfed crop, with its consequent problems of kanura and worm infestation. Another problem is a blight called virus, which causes the growth of the tubers to stop and the plants to yellow; farmers in Melga are unaware of a cure for this disease. Habas: As rainfall becomes scarce, haba crops that are flowering may be interrupted and a major portion of the crop lost due to imperfect bloom. Also, white worms attack the roots to cause a disease known as uspa onkoy (ash sickness) which dessicates the plant. Peas: The green pea harvest ends, along with the birds, and any remaining produce left on the vines will be left to dry and later threshed as grain. With onions, drought is the only major risk during this final month before irrigation water becomes available. Oca: Drought-induced caterpillar infestation is sometimes a problem.

For grain crops, March is a critical month. Heavy wind accompanying or following soon after a rain can result in stalk lodging. In corn, the young ears are swelling with tender kernals, which makes the crop a prime target for birds, rodents, and even dogs. A variety of worms begin to attack the kernals, especially the gusano blanco. Finally, an infection known as polvillo attacks the leaves and begins to prematurely dessicate the plant.

APRIL

Potatoes: The rainfed potato crop harvest begins simultaneously with the start of the miskha grande or early irrigated crop. Inclement weather in the highland plots may make harvesting uncomfortable but will cause little damage to the crop. The major problems at this stage are scarcity of laborers and falling prices as rainfed crop surpluses reach the market. Habas: no major risks. Peas and onions: Preference in irrigation water use is given to potato crops, with only leftover supplies available for other crops, such that peas and onions may suffer drought conditions. Ocas: As the harvest of this crop begins, wormy produce must be selected from the healthy tubers as quickly as possible because ocas offer a tempting environment for larval growth. Household poultry can also cause significant damage if not adequately protected before and during home storage.

For grain crops, April is an even more critical month than March. At this time corn stalks are cut and stacked, which ends the lodging risk but makes the produce even more exposed to predation by birds, rodents, and animals. In April huge flocks of tarakachis descend on the corn stacks during early morning and late afternoon feeding hours; bird-watchers armed with slingshots are imperative at these times. At night, rats and dogs attack the stacked corn, and except for the occasional use of commercial poisons there is little farmers can do control field losses. With regard to wheat, barley, and oats, April brings a high risk of mara (lodging) in which en-

tire fields are blown down. Always present is also the risk of serious crop destruction by unsupervised community livestock--particularly sheep and poultry--as the grain crops approach maturity. This problem is simply referred to by local residents as daño or damage.

MAY

Potatoes: May marks the beginning of the frost season, which extends into July. The risk is highest for the early miskha plantings, the seed of which can be frozen in their furrows, but the same fate can overtake still-unharvested rainfed potatoes or harvested produce from highland plots which are awaiting transport. Habas: Although this crop is quite resistant to cold, it can still be destroyed by frost or near-freezing temperatures, particularly if caught at a flowering stage. Lodging caused by wind is a second problem this time of year. A third is khoyura, a blight with a speckled appearance that stains not only the leaves and stalk but the haba pods and beans--thereby making the crop less marketable. Peas: Frost damage is a major risk in May. Onions: May is known for its high incidence of camanchaca (rotting). Ocas: The harvesting and storage risks for this crop continue. Corn: For late-planted plots, or those using "larger" (slower-maturing) varieties, the harvest-time problems described in March and April may be observed. Wheat and barley: May often brings mists that roll in from the Chapare region, and this moisture frequently results in polvillo. With this disease the heads of grain become covered with a fine yellow dust, causing the grain to change color and stop maturing. In May the cutting of these grain crops begins, and while stacked in the field the losses to rodents increase. Once at the threshing floor, losses to rodents before and after threshing can be expected. Oats: the two major risks in May are drought and frost damage.

JUNE

Potatoes: Frost risk increases in June for the irrigated crops. In some cases a timely irrigation just before or during a frost can prevent damage; but this is a matter of luck since not all growers can use the water at the same time. Habas, peas, and onions: the frost danger continues and intensifies. Oca: no activity. Corn: frost and rodent risks for late-maturing crops continue. Wheat, barley, and oats: For crops not yet reaped, the frost danger is very high in June. For crops in field drying or collected for threshing, the primary danger remains that of rodents.

JULY

Potatoes: For miskha grande and chaupi miskha plantings the risk of frost remains high through July. Worm infestation intensifies and requires continuing fumigation from now through the end of the calendar year. Habas: Water use preference is given to potato crops and thus the winter haba crop may experience drought conditions at this time of year. This can result in a caterpillar infestation known as mach'a khuru, which perforates the stalk base and dries the plant. Frost is also a risk for the haba crop in July. Peas: the frost risk remains high. Onions: In addition to the danger of frost damage, both July and August are months known for their high incidence of camanchaca (rotting). Ocas: no activity. Grain Crops: By July most corn crops have been harvested, dried, and stored. At this time the danger of rodents is concentrated on the wheat, barley, and oat crops, which are still being harvested and threshed. Unreaped grain crops are also exposed to possible frost damage.

AUGUST

Potatoes: Worm infestation continues, but the frost risk is over. Habas: Infestation by a green worm known as khomer khuru begins in August and may continue through the calendar year. Peas: no special risks. Onions: Beginning in August it is customary to start nurseries for onion seedlings. Such nurseries are commonly attacked by such pests as rats and ants, either of which can destroy an entire nursery bed in a single evening. Ocas: The planting of ocas often begins in August, but no significant risk is observed at this early stage. Corn: The planting season begins; no observed risks until after sprouting, when the shoots are preyed upon by birds, ants, and worms. Wheat, barley, and oats: As the threshing and winnowing of these crops is concluded, there are lingering dangers of losses to rodents.

SEPTEMBER

Potatoes: The presence of silvi khuru, another caterpillar pest, makes its presence in the chaupi miskha plantings. Habas: green worm infestation continues. Peas: no special risks. Onions: September is known for continued risks to the newly established nurseries. For transplanted crops a major disease is observed known as pupa in which most of the plant's growth becomes concentrated in a single stem while the others atrophy, the bulbs fail to develop, and the entire planting begins to resemble a plot of parasol-like flowers. Ocas: no significant risk is yet observed. Grain Crops: no major problem with corn, no activity in the other grain crops.

OCTOBER

Potatoes: The harvest of the miskha grande crop begins or continues, meeting very favorable market prices. The major danger remains worm infestation in chaupi miskha plantings. Habas: continuing worm infestation. Peas: no special problems. Onions: seedling predation continues. Oca: no problems provided new plantings receive moderate and timely irrigation. Corn: October is a critical month for corn, because August-September plantings now require irrigation yet available water supplies are insufficient to meet the needs of the first-priority chaupi-miskha crop. If the corn crop suffers drought conditions at this time it is quite likely it will not produce any grain, and will be used for fodder purposes only. Other Grain Crops: no activity.

NOVEMBER

Potatoes: By this time of year the community's reservoir is nearly empty, and rationing of water to the chaupi miskha crops must be applied. The drought conditions intensify worm conditions. One worm, known as rosario, bores into leaf stems; another, the mach'a khuru found also in habas, begins to attack the leaves as well. Habas: Drought becomes the single greatest danger to the crop, combined with worm infestation. Peas: As a second-priority crop with regard to irrigation supplies, drought is the principal danger to pea crops in November. Ocas: drought and worm infestation are the primary risks. Onions: drought. Corn: again drought. Wheat and barley: no activity. Oats: If the rains have begun the planting of this crop starts in October-November.

DECEMBER

Potatoes: Fumigation of the chaupi miskha crop continues, particularly to combat rosario and mach'a kuru. Habas: the silvi khuru, a former potato pest, also appears in the haba crop. Peas: Normally, by December the rainy season has arrived and the first harvesting of green peas begins; no special risks are apparent except in the event of continuing drought. Onions: no major risk except possibly drought. Oca: worm infestation continues, and possibly drought remains a risk. Grain Crops: Drought is the only major risk. Farmers prefer to plant their grain crops (with the exception of corn) in December so that they can be harvested early--by April--to reduce the risks of mara (lodging) and losses to frost midway through the following year.

COMMUNITY OF PUCA PUCA

Since Puca Puca is almost entirely dependent on rainfed agriculture, the principal risk facing its farmers is drought. The arrival of the rainy season is normally expected anywhere from November onward; in some years so significant rain is received before January. Plantings with early rains in October or November are often lost because subsequent rainfall in December or January is inadequate. Aside from the drought risk, farmers in Puca Puca face other weather-related dangers. One of these is excessive rain immediately after planting, followed by intense sunshine, which causes the soil to bake into a hard crust which traps the germinating seeds below--a phenomenon called embarrado. In some years late-planted crops are damaged by frost. Unseasonal rains in April-May, or cold winds and fogs that roll in from the eastern lowlands--a phenomenon known as surazo or pinganillo--can interrupt the final maturation of the corn and wheat crops. And finally, crops in Puca Puca are repeatedly threatened at different stages by ants, birds, rats, and rabbits.

The following risk calendar is restricted only to corn and wheat, which are the community's most significant crops and represent over 90 percent of total plantings. The calendar begins in October, which marks the beginning of the agricultural year in Puca Puca.

OCTOBER

Corn: The first rains are usually used to begin land preparation tasks, with planting being conducted in November or later. The only risk at this time of year is lack of rain. Wheat: no risk, because this crop is not planted until January.

NOVEMBER

Corn: The drought risk continues. If planting does occur, the principal risk becomes that of embarrado. Once the crop sprouts, the new danger becomes that of ant invasions--which destroy the seedlings at soil level--or predation by bird flocks. Wheat: no activity, no risk.

DECEMBER

Corn: If plantings have not been completed, the drought risk continues. For new plantings the risk of embarrado is always present. Ants and birds present a continuing danger. Wheat: Land preparations begin for January plantings; no risk yet exists except inadequate rainfall for tillaging activities.

JANUARY

Corn: January is possibly the most critical month because it concentrates so many risks at the same time. Drought remains a risk for late plantings. At mid-month there exists a brief period of frost danger. Ants and birds are continuous threats throughout the month. Rats and rabbits initiate a serious attack on the young corn shoots, particularly those located nearest the field boundaries and fences where these rodents live. To keep the predation of these animals under control, and to compliment their diets as well, residents of Puca Puca organize hunting parties during the months of July through November. The hunting party usually consists of about five adults and yields harvests of up to 50 rabbits in a single day. However, these rabbit hunts result in the dismantling of fences, which must be repaired by planting time in order to avoid still another risk: damage to the new crops by unsupervised livestock.

Wheat: The land preparation and planting of wheat crops must be completed during this month, so drought remains a risk. Once the plants have sprouted, the predations of ants, birds, and rodents begin. This new danger will continue for nearly a month, to mid-February.

FEBRUARY

Corn and wheat: The first half of February is practically a copy of the risk pattern described for January, except that drought is almost never a problem during February. The risk of damage by unsupervised livestock continues.

MARCH

Corn: In mid-March the frost risk briefly returns. This month also marks the beginning of the surazo season, which lasts through May. At any time during this period (and almost without warning) chill winds and mist can sweep into the region, harming the corn crop by damaging its flowering stage or subsequently interrupting the maturation of the ears. Wheat: By mid-March the drought risk intensifies. A new danger known as polvillo makes its appearance (often the result of a surazo). This disease attacks the panicles, covering them with a yellow dust and interrupting their maturation. For both crops, damage by unsupervised livestock is an ever-present danger.

APRIL

Corn: The danger of losses to birds and rodents intensifies again in April as the crop nears maturity. The risk of surazo continues, combined with that of frost between mid-April and mid-May. The corn fields must be carefully fenced to keep out grazing livestock. Wheat: April is the last month before harvesting. The risks of polvillo, surazo, and frost continue. Toward month's end the danger [illegible] bird and rodent damage intensifies.

MAY

Corn: As the harvest begins, the principal dangers remain those of frost, surazo, rodents, and birds. By mid-May the stacked corn has dried sufficiently to no longer be of interest to birds. Wheat: Frost, surazo, and bird threats are terminated by month's end, while the danger of losses to rodents intensifies.

JUNE

Corn: By June most of the crop has been husked and stored. Community livestock are now allowed to graze freely among the crop residues of harvested fields. There are no further crop risks until the next growing season. Wheat: As the crop is reaped and threshed all further risks of field losses end. The predation of rodents among grain awaiting threshing and winnowing at the threshing floor remains a problem.

JULY

Corn: no further activity until November; minor risks of losses in storage for grain not yet marketed, or grain saved for seed. Wheat: Threshing and winnowing continues; the rodent problem continues.

AUGUST

Wheat: The rodent problem ends with the last of the threshing and winnowing of harvested grain.

SEPTEMBER

No agricultural activity, no crop risks.

COMMUNITY OF HUAYCULI

The pattern of crop risks in Huayculí is very similar to that of Puca Puca. The principal dangers to crops are drought--a risk far exceeding all others in importance--followed by birds, rodents, ants, hail, and frost. Also present is polvillo in wheat, and with potatoes there are risks from jallu (rotting, due to excess moisture) or kanura (a hardening of the immature tubers, caused by drought. As with other communities, the danger of damage by unsupervized grazing livestock is practically continuous throughout the rainfed agricultural cycle.

OCTOBER

The rainfed agricultural year begins in October with the planting of potatoes. Corn is seldom planted before mid-November, and wheat crops are usually not planted until January. The only major risk in October is that of drought.

NOVEMBER

Potatoes: As plantings continue, the major risk is drought. Corn plantings may begin late in the month, and with them the bird threat begins.

DECEMBER

Potatoes: no major risk other than inadequate rainfall. Corn: The bird threat intensifies as plantings continue. A new risk, beginning in December and lasting throughout most of the rainy season, is that of hailstorms. The danger of sprout destruction by ants begins.

JANUARY

Wheat: Plantings of this, the principal crop of Huayculí, must be completed by the third week of January. Until this time drought remains the primary risk. A risk of almost equal importance is the farmer's inability--either individually or as part of a group--to arrange for tractor rental services to conduct land preparation and planting tillages for the large areas to be cultivated in wheat. As the crop sprouts, the danger from ants intensifies along with an increasing bird threat. Early frost becomes a danger late in the month, along with remote possibilities of hailstorms.

Potatoes: As the crop reaches flowering stage the frost and hail risk is magnified, but even so their probability of occurence remains fairly rare. Corn: Drought, hail, and frost risks are present.

FEBRUARY

Wheat: The danger of ants and birds ends. There remain lingering risks of drought or hail. Potatoes: Excess rainfall during February may cause jallu (rotting) of the nearly-mature tubers, while kanura (hardening and stunting of the tubers) may result if there is insufficient rainfall during the month. Corn: hail and frost risks persist.

MARCH

Wheat: The principal danger to wheat at this time is the mist of a possible surazo, which may bring on the disease of polvillo. Potatoes: no major risks remain once the harvest begins, although drought-induced kanura remains a remote threat. Corn: As the hail and frost danger subsides, the pre-harvest bird threat begins.

APRIL

Wheat: The risk of polvillo lingers. Potatoes: no further risk as the harvest is completed. Corn: The bird threat persists through mid-month, after which the crop is dry enough to no longer interest this pest. The danger of rat infestation begins.

MAY

Wheat: As the harvesting season begins the major risks to the crop consist of predation by birds and rats, and the danger of frost. Potatoes: no activity, no risks. Corn: As the harvest continues, the danger of rodents continues.

JUNE

Wheat: Reaping and threshing of the crop continues, along with losses to rodents. Potatoes and corn: no further activity, no crop risks.

JULY, AUGUST, SEPTEMBER

Wheat: threshing and winnowing activities continue to their end. The danger of an early rain which catches unprotected grain on the threshing floor remains a remote possibility.

TRADITIONAL INDICATORS FOR PREDICTING CROP PROSPECTS AND THE WEATHER

Although many beliefs and practices involving the prediction of natural phenomena are not followed by the younger generation, the older members of rural households throughout the Temperate Valleys region still employ a wide variety of natural indicators to guide their farming decisions. These indicators can be grouped in several categories. First, there are indicators for predicting crop prospects, both in the short-run as well as the long-range forecast. Second, there are indicators for predicting the imminence of important weather phenomena--like rain, frost, hail, and wind. Third, there exist a set of beliefs regarding good and bad days for the conduct of agricultural activities. Finally, there are many natural indicators for the conduct of non-agricultural activities or for predicting occurences within the rural community.

PREDICTING CROP PROSPECTS

LONG-RANGE INDICATORS

August is a critical month for predicting crop prospects for the coming year, but particulary the first three days of the month. On August 1st members of the farm household rise early in the morning to go outside and inspect flat stones in different locations near the farmhouse or in fields intended for cultivation. Each stone is lifted and its underside inspected for signs of moisture, especially droplets resembling beads of sweat. The ritual is repeated (with different rocks) on the following two days as well. Each day corresponds to a different planting month--for example, November, December, and January--or to a different planting period: early, middle, or late. If stones with moisture are found on August 1st, this indicates the prospect of early rainfall and instructs the farmer to also plant early. Similarly, moisture on stones turned over August 2nd or 3rd suggest the necessity of placing greater emphasis on middle and late plantings. If no moisture is encountered on the stone, a period of drought is indicated.

There are other August indicators as well. The occurence of frost any time during August is considered a sign of abundant rainfall during the coming agricultural year. In contrast, rain in August is considered bad--a sign of unstable rainfall during the planting season. August 2nd is also one of the most important celebrations in rural Bolivia--Día del Campesino (Farmer's Day). On this day many farm families walk around in the more isolated areas

of their communities to listen for the howl of the fox or the cry of toads and frogs. If the howl of the fox is heard, and if the howl is strong and clear, this indicates a good year ahead. If no howl is heard, or if the howl is abrupt or choked, these are signs of a bad year. The abundant cries of frogs or toads indicates a rainy year ahead, while the absence of such sounds is interpreted as a sign of drought. Another indicator employed on August 2nd is the bleat of the ox. If the ox happens to bleat two consecutive times, this is interpreted as a sign of happiness for a year of abundance to come. August 30th--the Day of Santa Rosa de Lima--is another traditional date for listening to the howl of the fox. Some families listen throughout the month of September.

There are other long-range indicators of crop prospects, some falling before August and others later--even after early plantings. Early May is another critical time for crop prediction. On May 3rd, the Day of Santa Vera Cruz--farmers wake before daybreak to watch the morning star. If it disappears over the horizon before dawn, a bad year is predicted. Farmers believe that the first six days of May should be overcast, for this indicates a wet year ahead. A constellation known as the cabrilla (cluster of stars near the Southern Cross) is an indicator of the prospects of heavy frost the coming year. If the cabrilla appears before Corpus Cristi (during the first 15 days of June) a year of severe frost is predicted. Meanwhile, the occurence of a heavy frost on June 24th (San Juan) is considered a sign of a good year ahead. So too is the prevalence of general cloudiness in June, a month normally characterized by clear skies during the day and night.

In July and August farmers observe the flowering of the muña bush. If the plant shows copius white flowers, a good crop year can be expected; a thin flowering indicates a year of very dry weather. The ulala cactus flowers in November; once again, a strong flowering is a sign of a wet year, a weak flowering the sign of a dry year.

SHORT-RANGE INDICATORS

An unusual abundance of rats, whether in the fields or around the farmhouse, is regarded as an indicator of a forthcoming year of hunger and drought. The presence of ants in greater than average numbers indicates the same outcome. Excessively large flocks of birds which attack new plantings is still a third indicator of a poor agricultural year.

Once crops are midway through their growth cycle, there exist a number of indicators for predicting the quality of the future harvest. If the ulala cactus continues to flower up to the month of February, this is considered a good sign that the corn harvest will be abundant. If the algarrobo (carob) tree produces copious fruit (long pods which are a favorite fodder of many

livestock), then this too indicates that the corn harvest will be plentiful. With regard to potatoes, there exists a special correlation with peaches--which is a common fruit crop throughout the Valleys region. Both crops are harvested at approximately the same time. The occurence of an abundant peach crop is regarded as an indicator of a poor potato harvest; similarly, when the peach harvest is below normal, an abundant potato crop can be expected. A final indicator of potato harvest prospects is when the plants grow taller and larger (more leafy) than normal. From long experience most farmers have in mind a norm of what size plants produce the most abundant yields; plant foliage produced in excess of this norm is misleading--an engaño(cheating)--indicating that too much growth energy has been invested in leaf development at the expense of the tubers.

PREDICTING WEATHER PHENOMENA

INDICATORS OF RAIN

When the sun appears "in its house"--that is, when a hazy ring appears around the sun--this is a good sign that it will rain within a day. If the moon is surrounded by a large, reddish ring, then no rain is likely; but if the moon's ring is small, half-white, or open at one end, this is an indicator that rain can be expected in the near future.

A rainbow seen to the east indicates the approach of rain; if seen to the west, the rain is about to stop.

Clouds that are grey and low are a sign of approaching rain. High, white clouds mean no rain is immenent. Dark clouds moving from the south toward the east indicate the approach of torrential rains. Between December and April, fogs that move in from the Chapare region (to the south) indicate immenent rain and possibly a surazo (chill winds and abruptly dropping temperatures). A dense cloud that moves from the north toward the south means that rain can be expected within 2-3 days. A hot, scorching day without sun is an indicator of rain the next day.

When lightning falls to the west, rain can be expected the same day or evening; however, lighting seen to the east is a sign that it will not rain for 2-3 days.

Animals and insects provide a variety of indicators of rain. The presence of mosquitoes (zancudos) and lightning bugs (luciernagas) are regarded as harbingers of rain. The cry of the chihuaco bird announces rain. If the bird is sitting at the top or side of the tree, a dry year can be expected; but when the chihuaco cries out from inside the tree's folliage, a wet year

is predicted. The cry of frogs and toads are still another rain indicator. During the months of April and May it sometimes happens that large numbers of churus or snails can be found beside paths; their presence is a sign that continuous rain is in the offing. Finally, the burro is regarded as an animal that smells the approach of rain: its ears begin to move around and around.

Before leaving the subject of rain, it is of interest to note that rural residents suffering from drought may participate in any of a variety of rituals for attracting rain. One of these is known as the pelea de manantiales or "fight of springs" in which water from one spring is taken and mixed with waters of a distant spring to instigate a conflict. The ritual has been known to cause violent rainstorms. Another practice is the ch'alla de lagunas or celebration (libation) to ponds. One such ceremony was observed in 1981 in a community next to Melga known as El Rodeo. The water level of El Rodeo's reservoir had dropped to dangerously low levels, so its residents conducted a ch'alla in hopes of replenishing it. The ceremony had barely ended when a hard rainstorm began which lasted for three hours.

INDICATORS OF FROST

During the period of March to August, a clear, starlit sky at night is a good indicator that a frost is likely. Sometimes frost is welcome, other times it is greatly feared. Frosts in June are usually welcomed because they follow the harvest of the rainfed potato crop, providing communities like Melga (who own highland zones) with an opportunity to freeze-dry a portion of their crop to make chuño (dehydrated potatoes), a basic staple of the farm family's diet. Frosts in August are welcomed as a sign of a wet crop year to follow. At other times, however, when crops are in various stages of growth, the arrival of a fost may be considered a disaster for the producer.. Any advance warning of this phenomenon gives the farmer time to prepare bonfires with green grass and weeds that cause thick smoke rather than fire, resulting in marginal insulation of nearby crop lots.

A second indicator of frost is the antawara, the term given to a sunset of red-orange clouds. The deeper the red, the stronger the frost. The antawara also is considered an indicator of wind, with the deepness of the red signifying the strength of the wind. A third frost indicator is the flashing of refucilos or clear-air lightning which is colored yellowish-red. The surazos which roll up from the south sometimes bring such abrupt temperature changes that even snow is possible on rare occasions; thus, any surazo brings a possible frost danger and should be seen as a signal to farmers to prepare their frost defenses. A final, longer-range frost-indicator is the behavior of cabrilla constellation (mentioned above).

INDICATORS OF HAIL AND WIND

The approach of hail is signaled by a heavy belt of dark, almost black clouds, often contrasted against strong back lighting. A farmer who has not been paying much attention to changing weather conditions may first become alerted to the hail danger by the squeeling of pigs. Swine are considered in rural Bolivia to be unholy--animals "denied by God" and the sound and sight of which are believed to be offensive to the Creator. Thus, many farmers believe that by flogging their pigs to make them squeel, their screaching will scare away the hail. In addition to beating their pigs, it is customary for farmers to put on black clothing (their mourning clothes), burn palm fronds, and run about the patio of their farmhouses shouting at the sky and ordering the hailstorm to move elsewhere.

In the case of wind, there are two indicators. The first is the approach of a surazo itself, which is almost always accompanied by chill winds. The second indicator is the antawara. Red clouds at night--"the sun of the dead"--are considered a faithful sign of strong winds the following day. The stronger the red of the antawara, the stronger are the winds that can be expected.

GOOD AND BAD DAYS FOR AGRICULTURE

Tuesdays or thursdays are considered bad days to begin an agricultural task. On the other hand, both are considered excellent days for the application of home remedies.

As in most regions of Bolivia, Valleys region farmers are careful to program several important farming tasks in accordance with the phases of the moon. It is advisable never to plant, hill, or begin the harvest during the conjunction--lasting one day and one night--between the full moon (juntha) and the new moon (huañu). By waiting to plant until the start of the first lunar quarter, the sprouting seeds "follow" the rapid growth of the moon for almost two weeks until the full moon is reached. Planting during the final waning quarter is considered inadvisable because it is a resting period for plants.

On Tuesday the 7th or Sunday the 7th a farmer should never begin a trip away from home; these days bring bad luck.

NON-AGRICULTURAL INDICATORS

Foxes are considered signs of bad luck, because these animals pose a constant threat to the rural household's poultry flocks and baby lambs. If a farmer encounters a fox crossing his path from left to right, this is a most unlucky coincidence, indicating that nothing will go well for him that day. It is best for the farmer to return home and remain there until the following day.

Snakes are sometimes considered good luck signs, sometimes bad luck. On the good luck side, a snake is a sign that the observer will receive money from a strange source. On the bad side, a snake is believed by many to steal the spirit (ánimo) of anyone who observes it. The observer should therefore try to kill the snake before it escapes.

Owls are regarded as signs of death. Their cry heard at night is believed to announce a death or an act of bewitchment in the very near future. Sometimes upon hearing the hooting of an owl, many residents will go out together to try to destroy it. Another bird announcing death is the chuseka; its nocturnal cry indicates the death of a child. A third bird of death is the jucu. If its cry is heard twice, it announces the death of a married man or woman; a single cry indicates the death of a bachelor. If the cry itself is very thin, it is a woman who will dry, but if the cry is thick and hoarse, a man will die.

The special howl of a dog at night--as distinct from mere barking--is also considered to be an announcement of a death within a few days. The antawara (red-yellow clouds at sunset) are also called the "sun of the death". It is regarded also as a sign of death, as an indicator of approaching sadness, which also coincides with the use of the antawara as a sign of windstorms.

When ants unexpectedly begin to cluster at some point within the house, this is seen as an indicator that its occupants are going to move, or even migrate out of the community. Unusual numbers of ants are also seen as a sign of a hunger period (a bad ahricultural year) in the near future. The increased presence of rats are seen as an indicator of an approaching epidemic or infectious disease.

To round out this non-agricultural indicator list, the song of the swallow (tarakachi) is a sign that important news is on its way from friends or relatives.

IRRIGATION ARRANGEMENTS IN MELGA

The communities of Huayculí and Puca Puca are almost completely dependent on rainfed agriculture. What few irrigation activities that do occur are mostly limited to the control of river water made available during the rainy season, and use of this resource is generally restricted to those families with farmland adjacent to riverbeds.

In Puca Puca, several households have acquired land outside the community (in the district of Cercado) near the Aiquile River. These acquisitions allow them to grow small plots of dry season vegetables and condiments. Also in Puca Puca, eight families have completed the construction of a micro-irrigation system known as a galería filtrante (filter gallery). The project captures and stores sub-surface water from a nearby stream bed, and then distributes this resource via a gravity flow canal to the participating user-households. The water is used for domestic use and also supports a few small plots of irrigated vegetable crops. Elsewhere in the community most residents have built holding ponds for collecting and storing rainwater; the water from these ponds is employed to water livestock, and for domestic use by the farm household.

In contrast, Melga is the only community with nearly permanent year-round irrigation water resources, with community-wide distribution arrangements, and with a large number of user-households. Melga has two sources of irrigation water: its own reservoir as well as river water. Some 150 water-users, with approximately 1-2 irrigated hectares apiece, are served by the system. A formal water committee exists to organize and supervise the distribution of water resources and the maintenence of the system.

HISTORY

The community of Melga, once a large hacienda, is served by the waters from eight separate springs. Before the Agrarian Reform, the former hacienda owners decided that the available water supply exceeded the needs of the hacienda itself and its resident tennant farmers, so the surplus was sold to some eight other communities downstream from Melga located the watershed of the Condor Puñuna watershed. Eventually the hacienda elected to expand its lucrative water supply resources by building two small reservoirs in the highland zone of Parina. The resident laborers of Hacienda Melga were allotted a water quota of four days and four nights per month. Of the potential users, native-born laborers or pegujaleros received a full water turn, while other (newcomer) residents or arrimantes received a half turn.

The four-day water quota assigned to Melga residents had to be further subdivided among all user households, so that any given family at best received no more than a few hours of water per month. In exchange for this service, all resident laborers were required to put in more than a week of labor per year in the cleaning of the reservoir. Each year the reservoir was drained, cleared of all debris and sediment, and then painstakingly its retaining wall was rebuilt with special sod blocks called tepes which had to be cut and transported from a distance of three kilometers.

Following the Agrarian Reform, and with the growth of the local population, residents of Melga decided to greatly expand the existing reservoir. In 1963, with technical assistance from the University of Cochabamba and the National Community Development Service, the community of Melga began the construction of a 75 meter wide earth-fill dam. Each water user was required to commit 100 days of labor and 200 pesos (US$16) in cash to the project. Users with half-turns contributed 50 days of labor and 100 pesos. Soil compacting on the project was conducted entirely by hand; no machinery of any kind was used on the project. The undertaking was completed in the space of a year, and inaugurated in early 1965. To administrate and maintain the new irrigation system, Melga's water users organized the "Committee for the Control and Distribution of the Waters of the Kuyoj Kocha Reservoir".

ADMINISTRATION

The Committee is headed by its President, who is also known as the Juez de Aguas (Water Judge). The position has been held since the project's inception by Hermogenes Rojas, a participant as well in the Traditional Practices Project. Other committee members include a Vice President, Treasurer, a Secretary of Works, and two Vocales (Delegates). The Works Secretary is responsible for maintenence of the irrigation system, determining what repairs must be conducted and organizing the users and available resources to implement them. The Treasurer collects all cash quotas or user fees, which go to financing the part-time salaries of two irrigation system employees--the Yaku Machu or "Water Lord", who controls all distributions, and the Cuidador or Reservoir Watchman". Both these authorities received a salary in early 1981 of 592.50 pesos (US$28) per year. Financing is provided by 81 users with a full mita or water turn and 75 users with a half turn. The annual user fee (in early 1981) was ten pesos for full-turn users and five pesos for half-turn users.

The Committee meets with its water users in three general assemblies each year. The first meeting is held March 1st. Its primary purposes are (1) to hear the annual report of the elected officers and, if necessary, elect new officers; (2) establish a repairs and maintenence plan to get the system in condition for the forthcoming irrigation season; and (3) to make a preliminary estimate of the available water aupply and program the number of water turns among the users. A second meeting is held on August 20th

to conduct a mid-season rectification of assigned water quotas if conditions justify this action. The last meeting of the year takes place on November 15th. At this time a control of all water-users is conducted to determine if they have exhausted their assigned water turns. At the same time a final calculation of available water supplies is made, and if there is still a surplus or yapa an equitable plan for its distribution is made.

Each water user is given a boleta or slip of paper which authorizes him to receive a single day's water turn. For example, in a year of abundant water in the reservoir, each full-user would receive, say, a total quota of ten water turns or mitas; accordingly, the user would receive ten boletas as well. These are distributed at the first yearly meeting. Each time a water turn is used the user must hand over a boleta to the Yaku Machu before the water can be released. A copy of the irrigation authorization is presented below:

ASOCIACION DE AGUAS
LAGUNA KUYOK KOCHA

Nombre _____

Socio No. _____ Mitas _____

Melga, _____ de _____ de 19 _____

_____
Juez de Aguas

Boleta Distributed by the Water Judge for Control of Water Turns Among Users

The distribution trunk canal is eight kilometers long from the reservoir to the last user in the lowland zone of Capilla. It takes the water three hours to flow that distance. The gate of the reservoir is opened for eight hours per day, beginning at 6 A.M. and ending at 2 P.M. For more efficient distribution of water, mitas are scheduled by zones of the community corresponding to different days. For example, on mondays and tuesdays the water is released to Condor Puñuna, Capilla, and Collpana. On wednesdays and thursdays it goes to Chaupi Melga and Chimpa Melga. On fridays and saturdays the water is taken to Loma and Tuty. Until 1981, sundays were scheduled for water service to the so-called "collective" properties--plots which are still the property of the old owner of the hacienda but which are cultivated by many Melga residents on a share-cropping basis (en compañia). Since the former owner has sold most of this land, almost all of it located in the

lowland zone of Collpana-Capilla, it was simply decided to assign this district a three-day schedule (including sundays) instead of its former two days.

THE RIVER WATER IRRIGATION SYSTEM

The four-days per month of river water irrigation water availability which was established by the former owners of Melga has remained in effect. Local residents distinguish between the two water sources by the terms larga (long) and mita. Reservoir water is always a bit muddy and is called "larga" whereas the water supplied from the river runs clear and is called "mita". Mita water is controlled by each user community individually, usually by an old and highly respected local leader who remembers the old customs. After Melga receives its four days, the water is released to the downstream communities of Tuty May, Laquiña, Choque Champi, Lava Lava, Catachilla, and others. The combined areas irrigated by river and reservoir water are estimated to be 1,600 hectares. Unlike the reservoir water turn, which lasts only eight hours, the river water turns are based on 24-hour days, distributed through two separate canals with an approximately equal volume as the reservoir canal. Thus, one river water mita is equivalent to about six reservoir water turns.

LABOR ARRANGEMENTS

The labor requirements of traditional agriculture in the Valleys region vary enormously from one crop to the next and from one community to another, but in general they are extremely high. For example, as shown in Chapter III, a one-tenth hectare plot of irrigated potatoes in Melga can require over 53 days of labor, or more than 37 days if grown under rainfed conditions. In Puca Puca, a one-hectare field of corn can require 12 days of oxen and 38 days of human labor. In Huayculí, where semi-mechanized wheat is grown, a two-hectare planting of this cereal still requires nearly 50 days of labor in addition to ten hours of tractor services.

In addition to being high in absolute terms, labor demand tends to be most unevenly distributed over the growing season. In the case of potatoes, the highest concentration of labor demand usually comes at planting time, when approximately one-quarter of all labor investments in the entire crop occur within the space of a day or two. This situation is further complicated, as is frequently the case in Melga, when the harvesting of the rainfed crop overlaps with the planting of a miskha (irrigated) crop in April, or when the miskha harvest overlaps with the planting of the rainfed crop in October-November. In the case of corn, as high as 60 percent of the crop's total labor requirements are concentrated at planting. As for wheat in Huayculí the exact opposite occurs: as high as 95 percent of all labor requirements occur at harvest time.

Given these considerations, it is in the interest of the farm household to meet as many of its agricultural labor requirements as possible using family workers. All adults of both sexes, and all children beyond the age of 6 or 7 years of age, are expected to be active participants. When family resources are not enough, the farmer faces at least three alternatives. First, he can "borrow" the labor services of his relatives, friends, or neighbors through the arrangement known as ayni. Next, he can invite these same people to contribute their time voluntarily--an arrangement known as minga or minkha--for which their only remuneration will be good will and copious amounts of food and alcoholic beverages. And finally, the farmer can hire the laborers he needs, paying them in cash, in produce, or a combination of both. Each of these alternatives will be described in detail below.

FAMILY LABOR

While family laborers will participate in any and all farming tasks, there generally exists a certain degree of specialization of work roles according to sex and age. The heavier tasks are normally given to male members of the work force. These include removal of boulders, land tillaging, furrowing, transport and application of manure, land leveling, hilling, fumigating, digging, hauling of harvest produce or crop residues, and threshing. Female workers usually participate in what are considered the lighter tasks of meal preparation, manure collection and mixing, seed selection, planting, field weeding, irrigating, collection and grading of harvested produce, winnowing of threshed grain, and produce marketing. Children (from age 5-6) are expected to assist with weeding, bird watching, harvesting, and errands in general.

The primary responsibility of the female head-of-household is food preparation. This begins with an early breakfast soon after daybreak, then the serving of the so-called almuerzo (lunch) before family laborers leave for their tasks between 7 and 9 A.M. The responsibility extends to the preparation and serving of the mid-day meal to family and hired laborers alike. It concludes with the evening meal for family members. If the household has hired migratory laborers from outside the community, the farm housewife is responsible for providing all their meals for the duration of their stay on the farm. Provided there is someone taking care of food preparation, any additional adult females will work exclusively in field tasks.

Of course, there are always exceptions to the normal task specialization given unusual circumstances. For example, when adult males are absent from the farm--perhaps to seek seasonal employment or to barter with producers from other regions--women can be found performing any required farming task (with the possible sole exception of fumigation). Male children in Puca Puca learn to plow by the time they are eight years old. Children of all ages in that community are the principal harvesters of the peanut crop. And quite frequently, when the female head-of-household is absent on a marketing trip, the male members of the family will prepare their own meals.

The participation of all members of the family in farming tasks is particularly important not only to economize on expenditures for hired laborers, but also because the tight schedule of most tasks demands such participation. In rainfed agriculture, planting must be completed within a few days following a rain or the opportunity will be lost. In irrigated crops, the farmer's water turn may only be available on a fixed date once a week or even once a month. Furthermore, tasks like planting, weeding, and hilling must also occur within a few days of an irrigation to take advantage of the softened quality of the moist soil. Last but not

least, the harvesting of different crops involves deadlines of their own that sometimes require concentrated labor investments. Potatoes left too long in the field face gradually increasing risks of worm and frost damage or falling market prices. Grain crops will suffer rising losses to rodents and spillage of brittle panicles the longer they are left to dry. Finally, when all farmers need labor at roughly the same time it becomes exceedingly difficult to hire workers within the schedules most suited to the producers' needs. For such reasons as these it is not in the least surprising that during the harvest period there exists high absenteeism among students in rural schools.

NON-FAMILY LABOR: THE AYNI SYSTEM OF LABOR EXCHANGE

Sooner or later the typical farm household must use non-family labor to supplement its own. To obtain this resource the most common contractual arrangement is to borrow labor under the arrangement known as ayni. As he would with any other type of loan obligation, the "borrower" of labor services first looks to his relatives and friends for assistance. Among these, he will first approach those families with whom he has conducted successful labor exchanges in the past--namely, those who clearly offer the resources he most needs in exchange for services he is in a position to offer in the future. To conclude a successful ayni exchange, the solicitant must make a personal visit to the home of the potential labor supplier at least several days before the loan is needed. The visitor offers his host a handful of coca leaves as a gesture of respect and of compromise; if the host accepts the coca this serves as an implicit signal that he will accept the labor request.

Even though an ayni transaction obligates the exchange of a present labor service for a future commitment to return a labor service of equal value, it still remains of critical importance that the borrower treat the lender with great respect and hospitality. In the morning, when the lender arrives at the work site, it is customary for the borrower to offer a plate of hot food before any task is initiated. During the day there should be at least four rest periods, and in each the borrower should provide the laborer with coca, cigarettes, and chicha. At the time of the sama or mid-day meal the laborer should receive a special quality of food, perhaps including meat or cheese.

The return of the ayni is usually made with an equivalent labor service, but this does not have to always be the case. On certain occasions the loan can be repaid with 1-2 rows of the crop planted, or in harvested produce, or even in cash. The price of the cash remuneration is highly variable depending on such variables as relationship to the lender, type of work, future expectations, and other factors.

Nor is the ayni arrangement limited only to agricultural tasks. Assistance between friends and relatives with regard to the roofing of a new home, or a marriage ceremony, or the marking of livestock, or even help with the funeral of a loved one--all are examples of activities subject to ayni arrangements. Even outright gifts--such as the baskets of food or cash contributions given to newlyweds--are regarded as aynillas or long-term loans.

THE MINKHA ARRANGEMENT

A variant of the labor reciprocity system is known as minga or minkha. It is utilized for undertakings requiring large concentrations of labor--for example, planting, harvesting, roofing a house, collection of fuelwood, and so on. The sponsor of the minkha goes around the community announcing his need for the voluntary labor services of his neighbors. Under the minkha arrangement there is no obligation to return the labor services received at a future date; there is no borrowing involved. However, the recipient of the labor services is obligated to provide all his cooperators with a handsome display of food and alcoholic beverage. The minkha event itself usually ends in a large fiesta, and in some cases it may last for two or more days. In other words, a minkha is a major social happening within the community. It provides an important mechanism for unifying the communal spirit of community residents.

Minkhas are not only organized by individual families with unusually large labor needs. They are also a principal mechanism of labor recruitment for projects of community-wide interest. To repair a road, or build a school, or conduct irrigation system maintenence, etc., it is often the case that community authorities--the Agrarian Syndicate, for example, or the irrigation committee--will designate a given day in which all resident families (or project users) are required to donate a day's work. Households not providing direct physical labor are expected to contribute to the preparation of food and drink, or to make a cash donation for financing them. Sometimes a minkha is called to provide a labor cooperation to community authorities who, because they are so frequently away from their farms on community business, have been unable to stay on top of their planting, weeding, and harvesting tasks.

CONTRACTING HIRED LABOR

Hired laborers can be contracted both from within and outside the community. If from within the community, hired laborers are usually recruited from among the poorest families--those with little or no land of their own (often newly-married couples who have elected to live independently from their parents but have still not received their land inheritance). The labor contract is typically stated not in terms of hours but rather a completed task--for example, a day of planting, a specified number of rows harvested, etc. The wage payment can be made either in cash or in

harvested products. In 1981 daily wage rates for ordinary agricultural labor in Melga, Puca Puca, and Huayculí ranged from 50 to 75 pesos (US$ 2-3). These rates were applicable for male laborers only, for female laborers--if they work for cash wages at all--are almost sure to be paid less. When payment is made in harvested products the amount is determined in accordance with the quality of the harvest, and with what other producers are paying. In general, the payment-in-kind is almost always worth more, at prevailing market prices, than the cash wage. For this very reason female laborers prefer to be paid in harvested produce, and also because there is no difference in produce wages paid to male or female workers. In all cases, the farmer who hires the laborers is also required to provide them with special food, chicha, and coca leaves or cigarettes during each work day.

When hired laborers are contracted from outside the community, it is the laborer who migrates in search of buyers of his labor services, not the buyer who does the searching. Just as residents of Puca Puca and Huayculí migrate seasonally to Santa Cruz and the Chapare region to work in the sugar and rice harvests, or to highland communities to work in the potato harvests, so too do highlanders come looking for work in the Valleys region when the corn and wheat harvests are beginning. The migrants usually prefer to work for payment-in-kind. However, in recent years a new initiative known as the mixed contract has gained popularity: 50 percent of the wage payment in harvested product, 50 percent in cash. The wage contract is conducted for a task area completed: for example, a specified field completely harvested for X amount of cash or produce, or several rows of a field for a payment of Y amount. The larger settlements are conducted with groups of migrants working as a unit. Fractions of a field harvested are negotiated with individual laborers, often workers who are accompanied by family labor during the harvest task. During the stay of one or more migrant laborers on the farm that has hired them, the host family is responsible for providing hem with food, shelter, water, firewood, and--without fail--coca or cigarettes.

LAND AND LIVESTOCK SHARE ARRANGEMENTS

As in any society, resources are unevenly distributed among residents of rural communities in the Valleys region. Some families are completely landless or own less than they need to feed themselves or simply wish to plant more land then they presently own; these seek to rent land. Other families --perhaps because of age, or insufficient family labor, or migration outside the community--have lands they are unable to cultivate; these seek to enter into land share arrangements with other families. A similar situation prevails with livestock. Some families have teams of oxen, others can not afford them. One household may have too many animals to graze on its own land and will seek to rent pasture and herding services. Another household may not have enough labor to spare for its own herding and will thus combine holdings under the care of a single shepherdess. Finally, there are all the miriad results of loaning and collecting money. A family with an emergency cash need borrows from a neighbor or relative; the other requests repayment in terms of harvest, livestock, labor or other resources. All these situations result in a wide variety of land and livestock share arrangements. Some of the most common are presented below.

ARRANGEMENTS WITH LAND

CASH LOAN FOR HARVEST SHARE: One does not have to work the land to acquire its benefits; what counts is a share of the harvest. Thus, cash loans in exchange for harvest shares is one of the most common resource exchange transactions in the rural community. The terms of the loan depend on the urgency of the borrower's need. Sometimes the borrower provides all land and labor as well as seed and any purchased inputs. In other cases the lender provides cash <u>and</u> required seed, manure, fertilizers, and insecticides. Normally, the harvest is divided equally between borrower and lender, with the lender's share considered payment in full of the loan. No interest is calculated in most transactions of this kind. The arrangement has high risks for both parties, but particularly the lender. Should the crop be destroyed by drought, hail, frost, or insects, only half of what little can be harvested will constitute the loan repayment. Conversely, an abundant harvest can disproportionately benefit the lender--especially when he has made no investment in inputs.

INPUTS FOR HARVEST SHARE: A second arrangement involves the provision of inputs in exchange for a harvest share. One party provides the seed, manure, fertilizer, and insecticides; the borrower provides the land and the labor. The harvest is divided equally. Arrangements of this kind are frequently made with <u>rankeras</u> (market intermediaries), but these usually only provide

seed. In such cases there is little incentive for the farmer to invest in yield-increasing inputs.

LAND RENTAL: Land can be rented for any kind of crop, but most families prefer to rent land for commercial rather than subsistence production, because they expect to make the rental payment with either a share of harvested produce or cash from market sales. In Melga, the typical land rental contract is for three years rather than one. This arrangement provides an incentive for the borrower to make a heavy manure and chemical fertilizer investment the first year (almost always to grow potatoes), because benefits of such fertilization are expected to last for three years. The second and third years of the rental contract will see the land used for grain crops, with no use of fertilizer.

SHARE-CROPPING: A final arrangement provides for the use of land in exchange for a specified share of the harvest. Again in the case of Melga, the former hacienda owners still control most of the community's choice bottomland; but since they are absentee landlords (living in the United States), they allow their land to be cultivated by community residents on a share-cropping basis under the supervision of an administrator. The simplest version of the transaction is for the tenant to provide all the labor, while the landlord provides the land in exchange for half of the harvest. If the tenant contributes seed, manure, fertilization, or insecticides, the value of these inputs are calculated and their cash value repaid in-kind by increasing the tenant's harvest share.

Known as the compañia system, the above share-cropping arrangements can be conducted both with individual families and on a group basis. For example, a number of community residents will organize themselves to rent a block of contiguous plots of land from the landlord. They will then hire tractor services, plant, cultivate, and harvest their combined holdings as a single field. At harvest, the landlord's share is reduced by the amount of total investments in manure and purchased inputs, while the share of the tenants is correspondingly increased. The latter is then divided among the tenants in accordance with their labor contributions to the undertaking. The tractor services investment is usually prorated equally among all participating tenants.

OTHER HARVEST SHARE ARRANGEMENTS: Throughout the Valleys region it is a widespread custom for harvest laborers to work for payment in produce rather than cash. The in-kind payment or paga varies from one crop to another, but the market value of the produce given is almost invariably higher than prevailing cash wages for agricultural labor. A second harvest share arrangement consists of paying laborers who participate in planting the crop with one or two furrows of the future harvest. The furrows are explicitly identified. The responsibility of harvesting them belongs to the laborer to whom they belong.

ARRANGEMENTS WITH LIVESTOCK

SHARING OXEN: Not all families have enough land to grow sufficient forrage crops (barley, oats) to support a team of oxen. Others may have the land but lack the money to buy such expensive animals. Such situations lead to a variety of oxen share systems. One of the most common of these is for one family to purchase the plowteam while the other family becomes responsible for the animals' feeding and care. Eventually, when the yunta is too old to continue working, the animals are sold. From the sale proceeds the first family subtracts its original capital investment; the balance is then split evenly between both parties to the transaction.

Another system involves a straight maintenence payment rather than joint-ownership. For example, some families specialize in the care of oxen and may raise as many as 20 animals at a time for their neighbors. For this service, the caretaker family will charge a specified price—like one carga (225 pounds) of potatoes per year for each draft animal raised.

SHARING COWS: Another common livestock sharing arrangement involves cows. One family buys a cow and remains its sole owner. Another family becomes the animal's caretaker. The first calf to be born is reserved for the caretaker family as its payment, the second calf goes to the owner of the cow, the third to the caretakers, the fourth to the owners, and so on until the animal is sold (or dies). If the cow is sterile from the beginning, it will be sold under the same arrangement as described above for oxen, with the net capital gain equally divided between the two families.

SHARING SHEEP: Most sheep are owned by a single family; co-ownership of the same animal is rare. However, even though the large majority of rural households own sheep, many of them—in Melga particularly—prefer to assign their flocks to caretaker families. Such shepherds frequently supervise flocks of 50-100 animals, consisting of sheep belonging to as many as a half dozen families. In exchange for shepherding services, the caretaker family is allowed to keep all manure. Additionally, shepherds usually receive other payments in kind such as produce, articles of clothing, or a share of the lambs. If an animal dies, it is the shepherd's responsibility to advise the owners. If the meat and hide can be salvaged, the butchering is done by the caretaker family and the meat split between them. But every arrangement tends to be unique depending on the number of animals involved and the relative needs of the caretakers and owners. Few arrangements are formalized on paper as a contract but rather they are fully discussed before hand. Breaking a verbal agreement or commitment is considered extremely dishonorable.

FARMER TRANSPORTATION

TRAVELING ON FOOT

Although Melga, Puca Puca, and Huayculí are all reached by all-weather roads and therefore enjoy, to varying degrees, the services of motorized vehicles, farmers still make many trips outside their communities on foot. To begin with, transport services are seldom available on a reliable or convenient schedule except on market days. For "short" trips of 10-15 kilometers, farmers often chose to walk out of preference because they consider it safer, or because they are so accustomed to walking, or because they wish to save money. As long as the traveler does not have to carry a heavy load, the liklihood of walking is very high.

Residents of Puca Puca often walk to Aiquile--located ten kilometers away--when the trip must be made during the week and no scheduled transport services exist. However, their most common trips on foot are made to inspect their cattle which are kept unsupervised in the distant monte (forested grazing lands) during the cropping season (see CATTLE, Chapter IV). A trip to the monte usually requires a walk of five to eight hours. When two or more farmers are grazing their cattle in approximately the same area of the monte, they sometimes accompany each other to and from the grazing lands. Most trips are initiated before dawn so that the traveler will have reached the grazing location by late morning. If there are no problems, the return trip can begin in the early afternoon. But if the livestock can not be immediately located, or if some other problem with the livestock exists, the trip may require an overnight stay in the monte or even several days.For this reason the farmer must take with him some basic provisions. In addition to dry rations (toasted or boiled corn, boiled potatoes, cheese or dried meat, etc.), he requires a lasso, a machete, a blanket or poncho, and--most important of all (considered an absolute prerequisite)--a bag of coca leaves.

Farmers in Huayculí make frequent walking trips to the market towns of Cliza and Tarata (about six kilometers distant) as well as other neighboring communities. Although walking is less frequent on market days--which is when motorized transport services greatly increase--it remains a commonplace activity. Residents prefer to embark upon such trips in the early morning hours. Usually two or more persons travel together to make the trip less monotonous. As they walk they discuss the latest news, talk about celebrations and other social events, exchange views about the marketing of their pottery, predict the weather, and--inevitably--dwell on local community conflicts, which are all too frequent for such a small village.

In Melga, which is located beside a paved highway and is the best served of the three communities with regard to transport services, long trips on foot are mostly limited to those between the community center and the highland (rainfed) planting sites in Tuty Parina, which are located about eight kilometers away. During October-November (the planting season) and April-May (the harvesting season), large numbers of Melga residents make this trip on a daily basis. Families with larger holdings requiring a week or more of continuous work by household and hired laborers will often establish a temporary residence in the highlands to avoid the long walk to and from home on a daily basis. Even so, those making the trip daily will carry their tools (including plowsets) up the mountain, and often return at day's end with a load of some kind: firewood, fodder for livestock, harvested produce, etc.

TRAVELING BY BURRO

Burros and horses are highly valued for their transport services in most rural communities. In Puca Puca, two out of every three families has at least a pair of these animals, and one household raises over a dozen burros. The burro is principally used to haul loads of firewood, corn, and muko (masticated flour, used to make chicha) from Puca Puca to Aiquile, and to carry return trips of kerosine, salt, sugar, fruit, and other necessities from Aiquile back to the community. For such trips the rural household will often rent additional pack animals from neighbors (if it does not have enough burros of its own), with each day of a rented burro payable with a day's labor provided by the borrower at a later date. Burros (and pack trains) are also used to take loads of corn, peanuts, and other produce to highland communities to trade for potatoes, papalisa, etc.

In Huayculí, only about one family in four has a burro, but use of these animals is shared on a rental basis. Burros are primarily used for long trips to the estancias, which is the name given to highland communities in general. These trips are essentially barter expeditions. The traveler loads up the burros with large and bulky loads of ceramics--plates, cups, pots, pitchers--carefully packed in straw and stored inside nets made of leather. The ceramic goods will be exchanged for potatoes or other cold-climate produce needed for the family larder. Normally, trips to the highlands take several days and will cover a variety of communities. Although it is usually made by the male household head alone, he will sometimes be accompanied by his wife or children.

In Melga, the primary use of the burro is to carry loads of potato seed, manure, and chemical fertilizer to the highland planting sites, and to bring home fodder, firewood, and harvested produce. On market days, the burro is used to carry market loads from the community to the edge of the highway to await public transportation. About one out of every two families in Melga has a burro; however, more than one burro per family is rare.

MOTORIZED TRANSPORTATION

The Valleys region enjoys a fairly well-developed highway infrastructure. Most rural communities can be reached by motorized traffic on all-weather roads. The most important and most common vehicle serving communities like Puca Puca and Huayculí is the so-called rapidito (literally, "little rapid one"), a pick-up truck which carries both passengers and cargo. Other vehicles--usually unscheduled--include five- and ten-ton trucks. On the trunk highways, bus service is available on a scheduled but somewhat unreliable basis. Micro-buses ply paved highways, such as that which passes Melga, but are primarily used for passenger rather than cargo transport.

MARKET DAY TRANSPORT SERVICES

On market days one observes an especially intense movement of motorized traffic--and of passengers and cargo--between market towns and the rural communities. On Sundays, trucks and pick-ups begin to collect passengers and cargo in Puca Puca as early as six A.M. to take them to the Aiquile market. The trucks customarily load passengers up front (behind the cabin) and cargo in back. As more and more passengers and cargo are collected, both are accommodated up to the maximum load tolerance of the vehicle and typically under conditions of increasing discomfort to the passengers, who often must travel standing up to provide maximization of load capacity. The discomforts are taken for granted. A complaint by a passenger about being over-crowded is likely to be greeted with a torrent of criticism by other passengers--"Buy yourself a truck", "Hire your very own taxi". Passengers do urge the driver or his assistant to go faster, to be quicker in their stopping and loading, so as to reach the market in time for the best sale hours.

Most of the travelers know each other. Conversations among them spring up spontaneously on such topics as community news, family news, product prices, best places to sell and buy at the market, suggestions for dealing with other buyers and sellers, and so on. For those traveling to market--but particularly for young men and women--it is customary to be as well dressed as possible, for market days are occasions for meeting suitors, getting together with freiends and relatives, and for doing a little celebrating. Almost nobody takes food with them on a trip to market, because once in town they prefer to treat themselves to a meal cooked by others accompanied by a glass of chicha.

Any time after mid-day, market participants begin to return to their communities. The trucks leaving earliest do so in an effort to make two complete round trips to the community of destination before nightfall. Residents of Melga who are returning from the markets of Sacaba or Cochabamba have their choice of an almost continuous traffic of trucks and buses

plying the Cochabamba-Chapare highway. The pick-ups on this route often carry as many as 35 passengers and their respective cargo at the same time. Residents of Huayculí usually have their choice of two or three trucks or pick-ups per afternoon for returning to their homes from the market days at Cliza, Torata, or Punata; however, there is never a sure guarantee or fixed schedule for this service. For residents of Puca Puca, if they miss their rapidito back to the community in the early afternoon there is always the chance to board any number of larger trucks which ply the Aiquile-Cochabamba route after four P.M. These vehicles leave off their passengers at roadside; it is then necessary to walk from there for a kilometer or more to reach home. On return trips from the market, passengers avidly converse about what happened to them and what they observed that day: people they met, a football game they watched, good or bad experiences they had with purchases or sales, etc. Some passengers will inevitably have had too much to drink.

BUSES AND MICRO-BUSES

A good portion of the passenger traffic of communities located on or near the paved highways use buses and micro-buses. These vehicles have highly flexible schedules; once they are filled to capacity, they depart for fixed destinations, stopping only to let off passengers or to take on passengers when room for them exists. Such vehicles are the preferred choice of farmers who carry very little cargo and who must travel in a hurry. For example, the community of Melga is served by two buses on market days in Cochabamba (Wednesdays and Saturdays) and Sacaba (Sundays). These vehicles have a capacity for 32 passengers apiece, with room for cargo on the roof; however, during periods of high demand these buses each carry up to 60 passengers.

For residents of Melga and other rural communities located along the Cochabamba-Chapare route, there exists an important flow of passenger traffic between their permanent residences and the colonization region to the northeast. Many of these passengers have their own small farms in the Chapare and go back and forth with great frequency. Others engage in seasonal migration, attracted by the coca and rice harvests. Because of the length of the trip (146 kilometers from Cochabamba to Villa Tunari), buses are the preferred transport means when the passenger does not have much cargo and is in a hurry. On return trips from the Chapare, however, the preferred choice of vehicle is usually the large cargo truck. These vehicles carry cargo loads on the floor of the storage area, but between the slatted sides wooden poles are stretched which are arranged in groups to provide seating for up to 35 passengers. Passengers on the Chapare route must bring their own provisions, or buy cooked food at the Sacaba truck control point, because from there to Villa Tunari there are practically no establishments where food is sold.

LOGISTICAL CONSIDERATIONS FOR A LONG TRIP

When a farmer prepares for a long trip requiring several days (or more) away from home, it is necessary to make careful preparations in order to keep trip expenses to a minimum. To economize on the purchase of food, the traveler prepares a quantity of dry rations. An amarro (bound package) of coca leaves is considered a prerequisite, because the narcotic effect of this product numbs the sensations of both hunger and fatigue. To economize on lodging expenses, the traveler always takes his own blanket or poncho. In many cases the traveler has a relative or friend who lives in the vecinity of his point of destination. It is taken for granted that such acquaintences will provide food and lodging to the visitor, even if his arrival is unexpected. Outlays for a boarding house or hotel are virtually considered a prohibitive expense for the typical rural traveler. But even with these intended economies, a farmer usually carries a considerable quantity of cash with him, because the trip is so often combined with a major sale or purchase. Cash is often carried wrapped in a handkerchief stored and pinned inside a pocket or in a coat lining. Some farmers also use moneybelts. Finally, the traveler usually carries a change of clothing, particularly if he has business to do in the city.

Unlike urban residents, the rural traveler generally does not use even a small suitcase; at most he may carry a satchel or a handbag. Packing one's provisions and clothing for a trip is normally done in such a way that the contents will entirely fit within an aguayo (cargo mantle) or a blanket that can be carried wrapped around the head and shoulder.

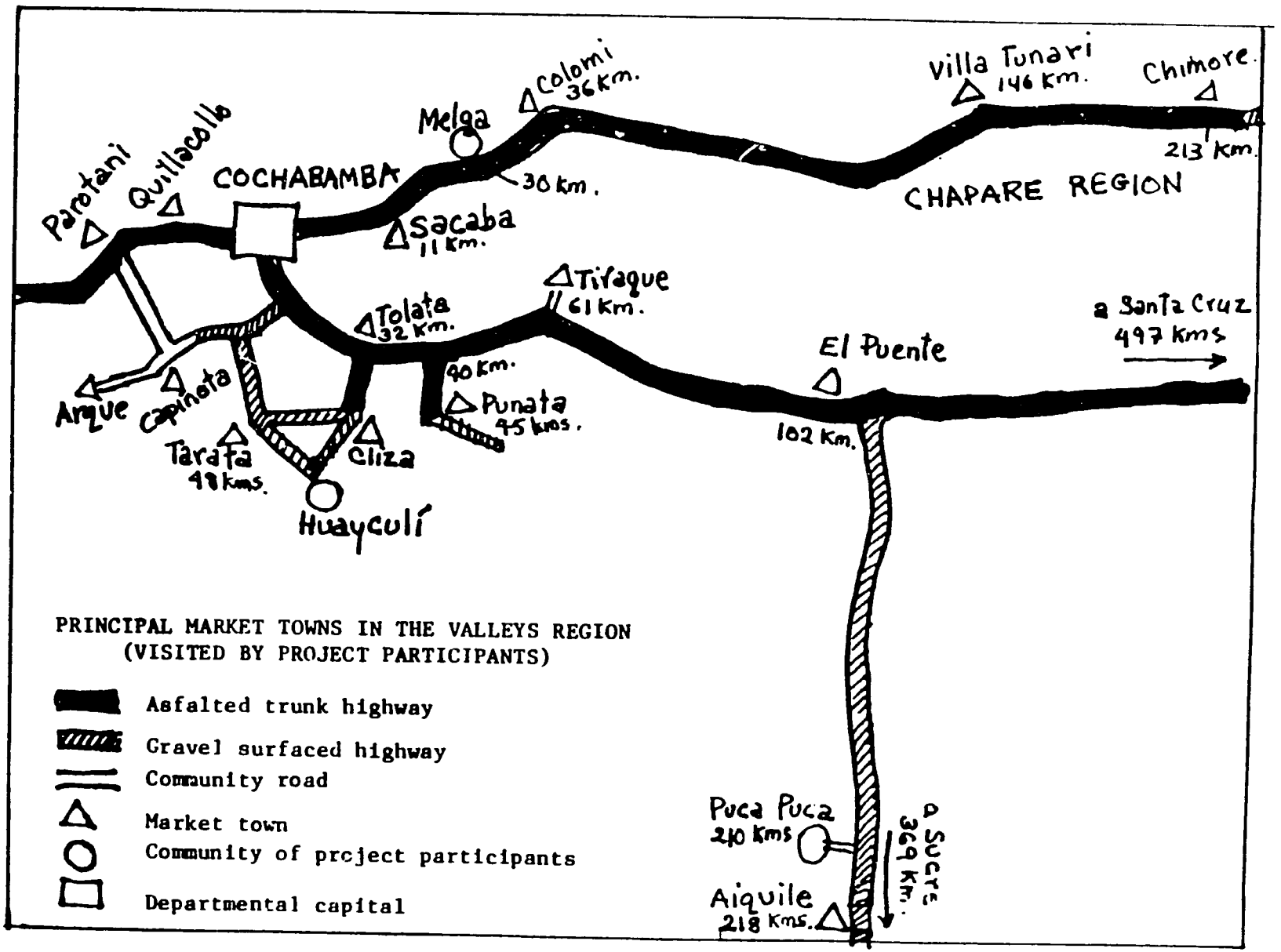
WEEKLY MARKETS

Throughout the Valleys region there exists a well-organized and decentralized network of weekly markets. These consist of weekday markets and sunday markets. Such is the scheduling and location of these markets that any rural household from Melga, Puca Puca, and Huayculí has at least two opportunities every seven days to sell farm produce and buy supplies. For example, on Mondays a market is held at El Puente, located about 100 kilometers from Cochabamba on the highway to Santa Cruz. On Tuesdays there is a market day at Punata, 45 kilometers from Cochabamba. On Wednesdays there is a market day in the city of Cochabamba. The following day a market is held at Tarata, 48 kilometers from the city. Friday is a day of rest for the agricultural marketing system. On Saturday, Cochabamba holds its second market of the week. Finally there are the Sunday markets, which are held simultaneously in many different towns throughout the department. Examples include Aiquile, Cliza, Sacaba, and Quillacollo. The locations of the weekday and Sunday markets are shown in the map presented below.

The similarities from one market to the next are many; to describe one is to practically describe all. The primary difference between the weekday and the Sunday market is that the latter usually fulfills not only a commercial function, but is also considered a day of recreation and festivity. On Sunday market days, members of th rural household attend church, watch sporting events, and socialize with friends and family. Community leaders often meet at the Sunday market to coordinate activities between their local agrarian syndicates and the regional federation. Young people take advantage of their Sunday market visit to show off their very best clothes. It is a day which adult members of the farm household will refuse to let pass without some kind of recreational investment: buying one (or many) glasses of chicha, eating some special food at the market, or purchasing a new item of clothing.

ORGANIZATION OF THE MARKET

Weekly markets are highly organized affairs because they generate income for, and are carefully supervised by, the municipalities where the markets are located. In the first place, there are usually three broad divisions or different types of markets within the overall feria (commercial fair): (1) the livestock market or playa de ganado; (2) the enclosed market, mostly devoted to manufactured items and the sale of cooked food; and (3) the fresh produce market. The latter market is further sub-divided into sections called kjatus. These include sections for grains (grano kjatu), potatoes (papa kjatu), poultry (wallpa kjatu), ceramics (loza kjatu), vegetables, (hortaliza kjatu), coca, firewood, and many others.


Parotani
Quillacollo
COCHABAMBA
Melga
Colomi
36 km.
30 km.
Villa Tunari
146 km.
Chimore
213 km.
CHAPARE REGION
Sacaba
11 km.
Tiraque
61 km.
Tolata
32 km.
a Santa Cruz
497 kms
El Puente
Arque
Capinota
90 km.
Punata
45 kms.
102 km.
Tarata
48 kms.
Cliza
Huayculí
Puca Puca
240 kms
a Sucre
369 km.
Aiquile
218 kms.
PRINCIPAL MARKET TOWNS IN THE VALLEYS REGION
(VISITED BY PROJECT PARTICIPANTS)
Asfalted trunk highway
Gravel surfaced highway
Community road
Market town
Community of project participants
Departmental capital

LIVESTOCK MARKET

The playa de ganado has been described in detail elsewhere (see LIVESTOCK MARKETING, Chapter IV). At this time its salient characteristics can be summarized briefly. The playa is held in a large open field, with sections devoted to cattle, burros, pigs, and sheep. There are two kinds of participants: farmers wishing to sell or buy an animal or two, and livestock intermediaries called mañazos who are selling or buying livestock in larger quantities, often a truckload at a time. Purchase transactions are characterized by intense bargaining, and agreements are celebrated with a drink between buyer and seller. For this reason the playa is surrounded by a considerable number of sellers of alcoholic beverages. A control point at one end of the playa allows the municipal authorities to levy the boletaje, a market tax on each animal sold, and the exportación or export fee on each animal transported out of the region by the mañazos. In 1981 both these taxes ranged about 60--80 pesos (US$2.40--3.20) per head.

THE ENCLOSED MARKET

Most weekly market towns have a formal market building simply known as the mercado. Such structures usually occupy an entire block, with multiple entrances from each of the four surrounding streets. The building may consist of a roofed or open-air inner courtyard which is surrounded by pillared corredors and one-room stalls where all manner of manufactured goods, prepared foods, and other items are sold. In some market towns the patio of the enclosed market resembles a miniature imitation of the retail section of the fresh produce market outside, and during the rest of the week the enclosed market may actually operate as a completely self-contained operation covering the full range of market items most frequently demanded by consumers. Inside the enclosed market one can usually find butcher shops, clothing stores, venders of shoes and rubber sandals, kitchen utensils, farming implements, agricultural supplies, electrical appliances, pottery, soap and candles, sewing supplies, dyes and yarns, and a variety of food sellers offering different beverages, soups, and typical meals of the region. In the patio of the enclosed market one will find many sellers of essential supplies most demanded by rural households: salt, sugar, noodles, rice, kerosine, bread, and so forth. Also located in the patio are retailers of vegetables and fruit. As with the produce market outside, venders pay rental and weighing fees in accordance with the space they occupy and their volume of business.

THE OUTDOOR PRODUCE AND GRAIN MARKET

When the weekly market town has an enclosed market building, the major produce and grain marketing areas are located outside and usually occupy the surrounding streets. When there does not exist an enclosed market, its equivalent is found in a belt of stalls surrounding the produce market. Merchants selling manufactured goods often trade their wares from the

back of a truck. At most weekly markets one will find dozens of parked trucks--some handling wholesale produce operations, others offering manufactured articles--their back ends open to the sidewalk or the street depending on which side contains the thickest flow of milling shoppers.

The produce and grain market is always sub-divided into sections or strips, each devoted to a specialized product or a particular type of transaction. For example, most weekly markets have a large section reserved for the predominant food crop of the region--like potatoes in Sacaba, or corn in Aiquile, or wheat in Cliza. Additionally, there are strips devoted to root crops (potatoes, papalisas, ocas, yucas), grain crops (corn, barley, oats, wheat, dry peas, habas), a vegetables section (tomatoes, onions, lettuce, peppers, cabbage, carrots, etc.), and a fruit section (bananas, plantains, oranges, and all manner of seasonal fruits depending on the time of year.

Furthermore, the outdoor produce market is further divided into an area for wholesale transactions (usually located on the outside of the market plaza) and another for retail transactions (located on the inside). Intermediaries typically dominate or control each of these areas. In theory, the basic rationale underlying weekly markets is to allow producers to sell directly to consumers. However, in practice the large majority of farmers prefer to sell their produce either to the larger intermediaries (comerciantes) or to the smaller retail intermediaries (rankeras). Indeed, from the earliest hours of the market day many large and small intermediaries gather at the edge of the market--where arriving trucks drop off their passengers and produce loads--to be the first to bid for available supplies of farm produce. For this very reason, the earlier the farmer arrives at the market place the more likely he will receive a better price; for as the morning wears on and intermediaries complete their purchases, produce prices gradually decline.

The bidding by rankeras for farm produce is frequently characterized by colorful and aggresive dialogues between buyers and sellers. For example, the following exchange was heard at the Sacaba market:

RANKERA: Caserita (housewife), you have to sell me your peas. I always buy from you. How much are you asking?
PRODUCER: I don't really know the price yet, but the carga (150 pounds) is selling for 600 pesos. If you want to pay me that price you can have my peas this minute.
RANKERA: How can you possibly ask that much! The arroba (25 pounds) is only selling for 100 pesos. How much would I earn?
PRODUCER: If you want it, fine; if you don't, leave it.
RANKERA: You farmers are all alike. You're so proud of your production! To grow this miserable stuff all you have to do is plant the seed and wait to harvest, and then you ask such prices!

With you people we have to beg you to sell to us as if you were gods. And then to sell the produce we practically have to beg consumers--even young children--to buy from us, but even then nobody is satisfied with what we give them.

PRODUCER: What do you know about work! You want everything given to you for nothing. I've already told you, if you don't like it you don't have to buy from me. There will be plenty of other buyers who will.

RANKERA: These indians! They think their produce is gold. There will not be other buyers willing to offer you as much as I have.

It bears emphasis that at least 90 percent of all rankeras are women. An even higher percentage of produce retailers--including rankeras and the representatives of farm households wishing to sell directly to consumers--are also women. Generally speaking, any sale of farm produce in a quantity of one cargo sack or less is usually conducted by women. Men usually are responsible for assisting with packing and transport of the produce to be sold, or for the sale of major wholesale quantities of produce following the harvest period.

Retail and wholesale transactions between producers and intermediaries or producers and consumers are typically conducted on a cash basis. The units of measurement for many products are presented below (see WEIGHTS AND MEASURES). When transactions occur between producers themselves, the system of barter prevails in place of cash. Terms of exchange for bartered produce are widely known among market participants, even though these terms are subject to change in response to the season and the relative abundance of the products being bartered. But as a general norm, barter transactions involve roughly equal volumes of one product for another: one carga of potatoes for one of unshelled corn, or one arroba for another, or one hatful for another, or one handful for another. When produce is transacted for ceramics, the barter terms are usually determined by what the plate or bowl or vessel will hold of the produce for which it is traded.

A widespread characteristic of retail operations is for intermediaries to buy a cargo of produce, then divide it into little mounds placed on the ground to be sold individually to consumers. These units usually weigh no more than 1-2 pounds and sell for about US$0.20 to 0.50 apiece. Such minor transactions are generally reserved for low-income consumers who can not afford to buy in larger quantities. The sellers themselves are known as kjateras (after the word kjatu denominating a market section).

OTHER MARKET FUNCTIONS

Aside from its fundamental commercial purpose, most weekly markets provide a convenient location for a variety of religious, social, political, and sporting activities. For most rural households, which are predominantly of the Catholic faith, a trip to market provides an opportunity to attend mass or at least to visit the church or chapel to burn a few candles and pray. On special feast days--like Palm Sunday, Easter, Corpus Christi, All Souls Day, Christmas, and many minor ones linked to the agricultural cycle, livestock celebrations, and local patron saints--the church at the weekly fair will be crowded with visitors throughout the day. However, members of rural households often visit the church whenever they are about to conclude an important market transaction, for example the purchase of a cow or a team of oxen, or to pray for guidance and success in their daily problems.

Once their selling and buying tasks are concluded, most market participants--women as well as men--invariably celebrate the day with one or more glasses of chicha with their acquaintenences before returning home. Many will treat themselves to a special dish of food. For young people, a trip to market is viewed as an opportunity for meeting members of the opposite sex, or engaging in courtship activities; for this reason they go to market dressed in their very finest clothes.

Weekly markets are often used as an opportunity for rural leaders to meet among themselves to discuss problems common to the region and the nation. Members of agrarian syndicates commonly meet to make contact with their regional federation authorities and to plan joint actions scheduled in the near future. A market day is also used by some farmers to conduct their trámites (procedures)--like getting a legal document signed, making arrangements for a loan, requesting services from a government agency, and so on.

Most weekly markets also serve as the location for a sporting activity involving local teams. These teams represent surrounding rural communities as well as the market town itself. The games are often sponsored by the local parish church, syndical organizations, and sports clubs organized by rural youth in different communities.

In general, a market day is the one special opportunity in the week when members of rural households have a chance to escape the drudgery of farming life. Not all members can go every week (someone must stay home to care for livestock and watch over the farm), so different members must take turns among themselves or even with neighbors. Yet it is rare when someone from the farm family does not attend at least one market day per week, or 3-4 times per month.

WEIGHTS AND MEASURES

In the Valleys region there does not exist a standardized system of weights and measures commonly used by all rural communities and market centers. Some units of measurement vary from one crop to another. Even for the same crop, units employed in community level transactions are often different from those used in the nearest local market. Furthermore, different communities may use similar names for measurement units--like the carga or arroba--but apply different equivalents to them. Under normal circumstances, if buyer and seller of a commodity follow different weight systems, the system that will be used is determined by where the transaction takes place: if within the community, the farmer's weights; if outside the community, the buyer's weights. Rural households are usually quite knowledgeable about differences between their own weight units and those used elsewhere. Such knowledge is an important factor guiding their marketing decisions.

COMMUNITY OF HUAYCULI

AREA PLANTED

Farmers in Huayculí measure area planted in terms of the quantity of seed utilized. Wheat, corn, and peas are measured by arrobas or viches (see below), while potatoes are measured by cargas. The conventional equivalents are the following:

Wheat, corn, peas: 1 arroba of seed = 1/4 hectare planted
Potatoes: 1 carga (200 pound bag) = 1/12 hectare planted

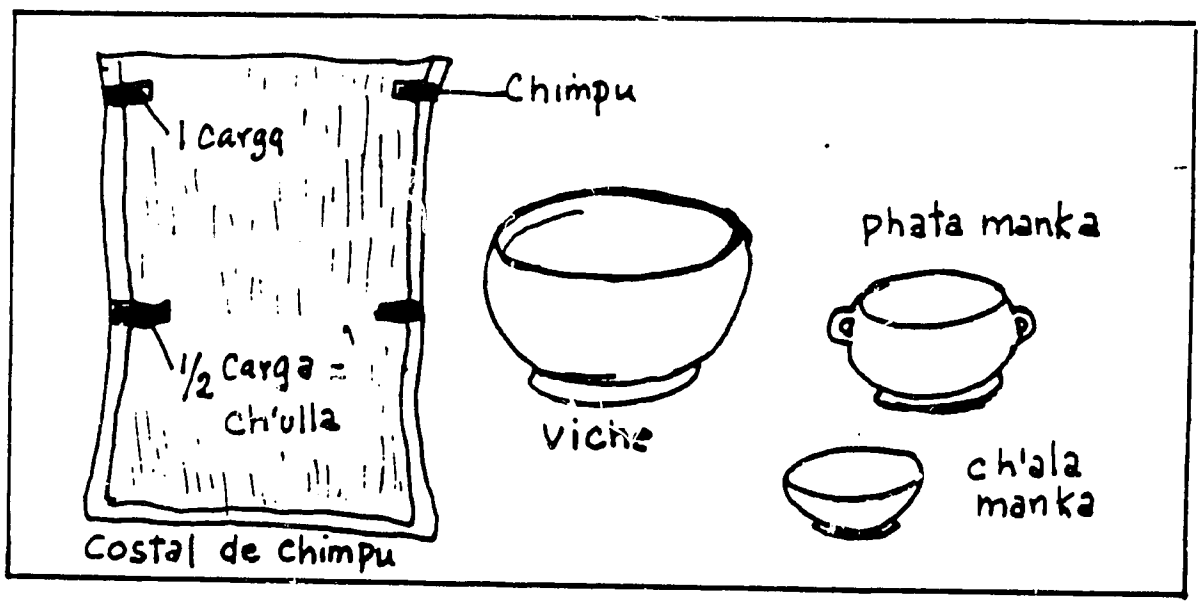
COMMODITY WEIGHTS

Large quantities (for wholesale transactions or harvest estimates) are measured in fanegas and cargas, while smaller quantities in arrobas and viches varying by crop. A viche is a ceramic bowl designed to hold one arroba of grain. A viche of wheat is considered to weigh 45 pounds, a viche of corn 36 pounds, and a viche of barley 32 pounds. The viche system has fractional units known as phata mankas (1/2 viche) and ch'ala mankas (1/4 viche). Similarly, four viches make a carga and eight viches make a fanega. In the case of potatoes and other bulky produce, the system of measurement is built around the conventional arroba of 25 pounds, and cargo sacks known variously as cargas, pesadas, or tupus--all equivalent to 200 pounds--and half-sacks, called ch'ullas--of 100 pounds. The sack

for measuring potatoes is known as a costal de chimpu because it contains markings in colored yarn, called chimpus, indicating half- and full-sack loads. Farmers normally load about five pounds of extra produce per sack to compensate for the weight of the sack itself.

It should be emphasized that the use of viches and sack measures are mostly limited to transactions within the community, where few farmers have access to a scale or weighing platform. However, outside Huayculí the system of measurement employed by most market intermediaries is that of the conventional 100 pound quintal consisting of four arrobas of 25 pounds each.

The appearance of the carga and viche units is illustrated below. These units are then converted into pounds and metric kilo equivalents as these apply to specific crops.



Traditional Units of Measurement

	Pounds	Kilos
WHEAT		
1 fanega = 8 arrobas = 8 viches =	360	162
1 costal or carga = 1/2 fanega = 4 viches =	180	81
1 viche = 1 arroba =	45	20.25
1 phata manka = 1/2 arroba = 1/2 viche	22.5	10.35
1 ch'ala manka = 1/4 arroba = 1/4 viche	11.25	5.175
BARLEY		
1 viche = 1 arroba	32	14.72
1 phata manka = 1/2 arroba	16	7.36
1 ch'ala manka = 1/4 arroba	8	3.68

CORN	Pounds	Kilos
1 fanega = 8 arrobas = 8 viches =	300	135
1 carga = 4 arrobas = 4 viches =	150	67.5
1 viche = 1 arroba =	36	16.2
1 phata manka = 1/2 viche =	18	8.1
1 ch'ala manka = 1/4 viche	9	4.1
POTATOES		
1 carga (tupu, pesada) = 8 arrobas = 8 viches =	200	90
1 ch'ulla = 1/2 carga = 4 arrobas = 1 quintal =	100	45
1 paga (one day's wage payment in kind) =	50	22.5
1 arroba =	25	11.5
Media-arroba =	12.5	5.75

COMMUNITY OF MELGA

AREA PLANTED

As in Huayculí, farmers in Melga measure area planted by the quantity of seed they use. Potatoes are measured by cargas. Wheat, barley, oats, corn, broadbeans, and papalisa are measured by arrobas and quintales. Onions are measured by kilos. The common equivalents in area planted are as follows:

Potatoes: 12 cargas = 1 hectare; 1 carga = .08 hectare
Wheat, barley, oats, corn, etc: 1 arroba (25 pounds)=1/4 hectare
1 quintal (100 pounds) = 1 hectare
Onions: 6 kilos = 1 hectare

COMMODITY WEIGHTS

In Melga, the commonly used weight units are fanegas, cargas, arrobas, viches, phata mankas, and ch'ala mankas. However, unlike Huayculí, the viche in Melga equals two arrobas (50 pounds), and the arroba itself is uniform for all crops, as follows:

POTATOES, OCA	Pounds	Kilos
1 carga (tupu, pesada) = 9 arrobas =	225	101.25
1 ch'ulla = 1/2 carga =	112.5	50.62
1 paga = 2 arrobas	50	22.5
1 arroba =	25	11.25
WHEAT, BARLEY.		
1 fanega = 12 arrobas	300	138
1 carga = 1/2 fanega = 6 arrobas =	150	69
1 viche = 2 arrobas =	50	22.5
1 phata manka = 1 arroba =	25	11.25
1 cn'ala manka = 1/2 arroba =	12.5	5.75

OATS

Dry Grain	Pounds	Kilos
1 quintal = 4 arrobas =	100	45
1 viche = 2 arrobas =	50	22.5
1 arroba = 1 saquillo = 1 phata manka	25	11.5

Green (Avena Berza)

1 carma = 2.5 brazadas + 1 cuarta + 1 t'ajilli + 1 puño
(6.75 mt) + (68 cm) + (8 cm) + (6 cm) = 7.57 mts

BROADBEANS, PEAS

Dry Grain		
1 quintal = 4 arrobas =	100	45
1 viche = 2 arrobas =	50	22.5
1 phata manka = 1 arroba = 1 saquillo =	25	11.5
1 ch'ala manka = 1/2 arroba =	12.5	5.6
Green Pods		
1 carga = 6 arrobas =	150	69
1 ch'ulla = 1/2 carga = 3 arrobas	75	34.5
1 paga = 1.5 arrobas =	37.5	17.25
1 arroba =	25	11.5
1 quartilla = 1/4 arroba =	6.25	2.88

ONIONS

1 carga = a full sack (measured by volume only, no specified weight
1 pituca = a blanket 1.20 x 1.20 mt, filled with produce and bound

CORN

This commodity is not weighed in Melga because it is never sold. All production is for family consumption.

COMMUNITY OF PUCA PUCA

AREA PLANTED

For their principal crops, but sometimes minor crops too, farmers in Puca puca measure area planted by the number of yuntas (days of oxen or plowteam) required to plow the furrows and bury them once seeded. For small plots, fractions of yunta days are calculated, the minimum unit being 1/4 yunta or two hours. Even smaller areas are referred to in non-standardized units such as melgas (groups of furrows) or surcos (furrows). They are usually tillaged by hand rather than with the ox-plow. For yunta days the most common equivalents are:

Wheat: 4 yuntas = 1 hectare; 1 yunta = 1/4 hectare
Corn, potatoes: 3 yuntas = 1 hectare; 1 yunta = 1/3 hectare

COMMODITY WEIGHTS

In Puca Puca, harvested products are measured by standard arrobas of 25 pounds each, as in Melga, but without recourse to the vicha system. However, the terms given to the largest (wholesale) units are different and are also aggregated differently depending on whether the product is in dry grain or has been processed. The following equivalencies illustrate both the complexities as well as similarities or differences with the other communities.

CORN	Pounds	Kilos
Dry Grain, shelled		
1 tirada = 9 arrobas =	225	102.06
1 pesada = 1 carga = 5 arrobas =	125	56.7
media pesada = 2.5 arrobas =	62.5	28.35
1 arroba=	25	11.34
media arroba	12.5	5.67
1 cuartilla =	6.5	2.95
Corn Meal, Muco for Chicha		
cinco = 9 arrobas	225	102.06
medio cinco		
WHEAT		
1 fanega = 20 arrobas =	500	226.8
media fanega = 10 arrobas =	250	113.4
Wheat Flour		
1 fanega = 18 arrobas =	450	204.1
media fanega = 9 arrobas =	225	102.06
POTATOES		
1 tupu = 1 carga = 9 arrobas =	225	102.06
ch'ulla = 1/2 carga = 4.5 arrobas	112.5	51.03
cuartilla = 1/4 carga = 2.25 arrobas	56.25	25.51
1 arroba =	25	11.34

In Puca Puca, chicha or corn beer is manufactured by practically all households. This alcoholic beverage is also sold at weekly markets. The units of transaction are the following:

CHICHA
1 lata (lard can) = 20 liters = 1 tupu
media-lata = plastic tank of 10 liters (bidón) = 1/2 tupu
cuartilla = plastic tank of 5 liters =1/4 tupu
jarra (pitcher) = 4 beer glasses
doble = 1 beer glass

For wholesale transactions, chicha is sold in turriles (barrels or drums) of 200 liter capacity.

CHAPTER III.

FARMING PRACTICES FOR SPECIFIC CROPS

Most of this chapter is devoted to only three crops: potatoes, corn, and wheat. Potatoes are the principal commercial and subsistence crop of Melga, where they are grown under irrigated as well as rainfed conditions. Corn is the major crop of Puca Puca, accounting for some 80 percent of all area cultivated. Wheat is the primary crop for the busy potters of Huayculí. For each of these agricultural enterprises we have selected a representative farm household that grows it. We describe how the crop fits into the family's overall land use, how much labor and supplies were used to grow it, what was the harvested yield, and what was the net income that accrued to the family for its efforts. Differences in crop production techniques from one community to the next are also described.

The final section of the chapter contains less detailed descriptions of six additional crops. In order of their importance, these crops are peas, oats, broadbeans, peanuts, ocas, and onions. Peas are grown in all three communities. Peanuts are only grown in Puca Puca. All other crops are grown in Melga. The above still does not exhaust the list of agricultural enterprises found in the studied communities. Other crops include barley and strawberries in Melga, or tomatoes, lettuce, garlic, cumin-seed, and linseed in Puca Puca. However, these final crops are not described because of space limitations, and because they are grown by only a few families.

POTATOES IN MELGA

The community of Melga is one of the principal centers of potato production in the Valles region. It is known for its high quality produce and reliability of supply. Both of these characteristics are largely due to the fact that Melga enjoys not one but two sources of irrigation water--both river and reservoir. As a result, intensive agriculture is the norm in this community. For any given month, one can find potatoes in many different stages of production. For example, a survey of participants in the Traditional Practices Project during 1980--for potatoes alone--found land preparation tasks occurring in all twelve months of the year, planting tasks during ten months (except March and April), fumigation tasks during eight months (July to February), harvest tasks during twelve months, and marketing of potatoes in all months except July.

Even so, there are three distinguishable potato planting seasons--the first two for irrigated crops and the last one for a rainfed crop. The irrigated plantings are known as miskhas. The miskha tarpuy or "first planting" occurs after the end of the rainy season and lasts from April to June. The second is the chaupi miskha or "middle planting", which runs from June through August. Finally, the wata tarpuy or "yearly planting" is conducted during October and November, and only in the highland crop lots.

In this section we will provide a description of the potato crop, first as it is grown under irrigation and then under rainfed conditions. To provide numerical detail of timing, labor use, production costs, yield, and net income, we will present a case study of each type of crop. The first is the miskha tarpuy crop of Germán Acosta, which was planted April 9, 1980 and harvested in September and October of that year. The second case study is the wata tarpuy crop of Eusebio Castro, which was planted November 19, 1979 and harvested during the period April-June, 1980.

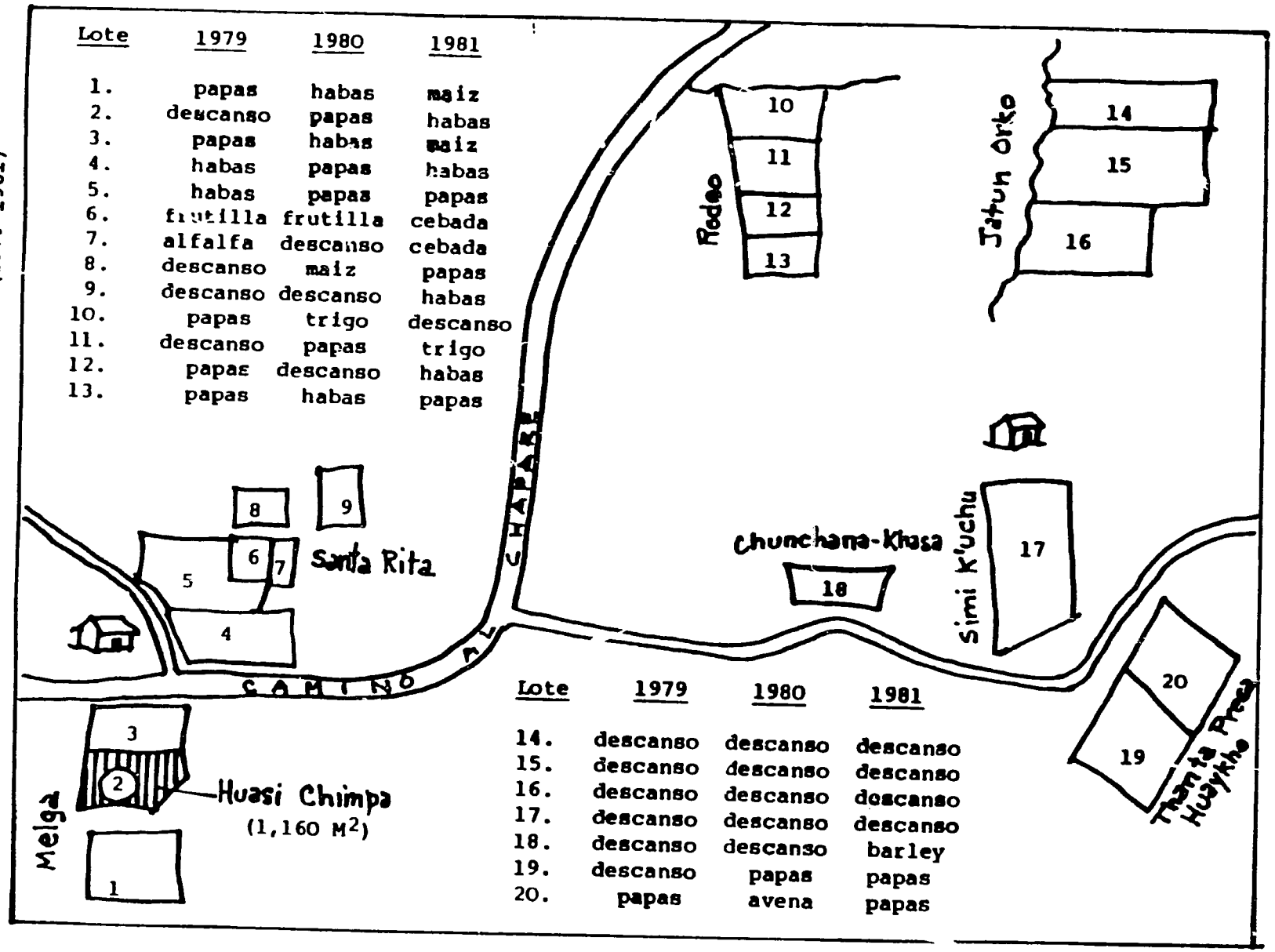
IRRIGATED POTATOES
MISKHA TARPUY: A SUMMARY OF CROP PERFORMANCE
(GERMAN ACOSTA--APRIL TO OCTOBER, 1980)

AREA PLANTED AND SEED USE: In April 1980, Germán Acosta planted a lowland plot known as Huasi Chimpa to miskha potatoes. The plot measured 1,160 square meters (0.1 hectare) and was located only about 300 meters from Germán's home in the Melga urbanization, on the other side of the road to the Chapare. In 1979 the same plot was in fallow; in 1981 it was planted with habas or broadbeans. A map showing the location and sequence of the miskha potato crop in relation to the entire holdings of the Acosta household is shown on the following page. At Huasi Chimpa, Germán planted 1.75 cargas (394 pounds) of potato seed using the variety known as Imilla Blanca. He likewise employed 22 costales (sacks) of cattle dung with an estimated total weight of 2,200 pounds, and 100 pounds of chemical fertilizer.

LABOR AND ANIMAL USE, BY STAGES: During land preparation, the Acosta family devoted 12.5 days of family labor and 4 days of oxen. Four separate plowings were conducted; in addition, 3.5 labor days were devoted to removing rocks and weeds while one day was employed to irrigate the plot prior to plowing. The planting itself was conducted in a single day (April 9, 1980) with three family laborers, seven hired laborers, and a team of oxen. Cultivation tasks involved two hillings, three irrigations, and one fumigation with Perfektion. These activities involved ten days of family labor, three of hired labor, 16 hours of water, and one-fourth of a liter of insecticide. The harvest began 135 days after planting, was conducted on two separate occasions (September 23 and October 2), and required a total of nine days of labor, five of which were hired.

PRODUCTION AND INCOME: The Huasi Chimpa plot produced a total of 11 cargas (2,475 pounds) of potatoes, or a return of just over six times the quantity of seed used. Excluding family labor costs, the total expenses for the crop came to 4,480 pesos or US$179. The total estimated value of the harvest was 7,750 pesos or US$310, which yielded a net income of 3,270 pesos or US$131. This amounted to 139 pesos (US$5.57) for each day of family labor utilized (23.5 days in total). In 1980 the wage rate for hired laborers was 50 pesos (US$2) per day. As for the classification of harvest, six cargas (55%) were first quality potatoes, three cargas (27%) were second quality, 1.5 cargas (14%) were third quality, and 0.5 cargas (04%) were fourth quality.

CROP LOTS AND LAND USE OF GERMAN ACOSTA (1979-1981)



Lote	1979	1980	1981
1.	papas	habas	maiz
2.	descanso	papas	habas
3.	papas	habas	maiz
4.	habas	papas	habas
5.	habas	papas	papas
6.	frutilla	frutilla	cebada
7.	alfalfa	descanso	cebada
8.	descanso	maiz	papas
9.	descanso	descanso	habas
10.	papas	trigo	descanso
11.	descanso	papas	trigo
12.	papas	descanso	habas
13.	papas	habas	papas

Lote	1979	1980	1981
14.	descanso	descanso	descanso
15.	descanso	descanso	descanso
16.	descanso	descanso	descanso
17.	descanso	descanso	descanso
18.	descanso	descanso	barley
19.	descanso	papas	papas
20.	papas	avena	papas

SOIL TILLAGING AND OTHER PREPARATIONS FOR PLANTING

Land preparation tasks for the miskha potato crop usually begin in March or April following the conclusion of the rainy season. Soil tillaging is known as barbecho or barbechada and consists of various individual plowings or rejas, all conducted with the ox-drawn wooden plow. The first reja is required to turn over the soil, bury grass and weeds, and to destroy the larva of harmful insects by exposing them to the cold or direct sunlight. The second reja is conducted after about 4-6 days and a third reja about a week after the second. Each reja is plowed in a different direction (usually perpendicular) to the plowing which preceeded it. Women and children participate in these tillaging tasks by pulling weeds--using their hands, or if necessary a pick--and removing stones. The weeds are usually gathered at field boundaries, allowed to dry, then burnt, and their ashes scattered to improve soil quality.

Once the soil has been tillaged several times, the field is given a pre-planting irrigation known as the empanto or soaking. In addition to providing the soil with adequate moisture to promote seed germination, the empanto allows the farmer to make an initial appraisal of soil quality, differences in water retentiveness from one part of the field to another, and slope considerations--all of which will influence his future furrowing strategy. Following the empanto, it is common for farmers to conduct still additional tillages, sometimes as many as five, and always plowed in different directions. The final soil preparation task is kuspeo or land leveling. This is done by having a team of oxen pull a heavy T-shaped implement known as the rodillo or wooden roller (see FARMING TOOLS). To increase the weight of the roller, the plowman often rides on top of it.

A final pre-planting task entails the procurement and preparation of manure and/or chemical fertilizers. For miskha potatoes, farmers in Melga use chicken manure, sheep dung, cattle dung, or a combination of these products. Chicken manure is obtained by purchase from poultry farms located outside the city of Cochabamba. To assure the supply of this product, some farmers make their purchases early in the year--in January and February; they pile the manure beside their homes and protect it during the remainder of the rainy season by covering it with straw or nylon sheets. Those households without adequate livestock obtain cattle and sheep manure by barter arrangements--usually one truckload of avena en bersa (green oats) for an equal truckload of manure. In addition to animal manures, most farmers in Melga also use chemical fertilizers. The most popular formulas are 18-46-0, 20-20-0, and 16-20-0. As with manure, chemical fertilizers should be purchased and stored well in advance of planting because

commercial stocks of these products frequently become scarce in local markets. The general norm in Melga is to apply about two arrobas (50 pounds) of chemical fertilizer for every carga (225 pounds) of potato seed.

SEED SELECTION

A few households in Melga participate in special potato production programs sponsored by external agencies--namely, the Agricultural Bank (BAB), which runs a combined farm credit and crop insurance scheme, and a private sector institution known as ASAR. In these instances, participating farmers are provided with certified potato seed which they are required to soak in disinfectant prior to planting.

However, most families in Melga grow their own seed. The primary precaution is to make sure the seed comes from a different plot from the one where it is to be planted. Potatoes harvested from the (highland) rainfed plantings are frequently used in miskha potato crops at lower locations. The most popular seed variety is Imilla Blanca. About every 3-4 years it is customary for a household to purchase its potato seed from outside Melga--a practice intended to reinvigorate its seed stock. Furthermore, farmers employ different varieties in accordance with different soil conditions. For example, in a single plot characterized by a steep porus soil in its upper portion and a flat heavy soil in its lower portion, two different seed varieties may be used.

Seed selection is a task predominantly controlled by women. There are two separate selections. The first takes place during the harvest itself, when potatoes are graded by size into a variety of classes for sale, home consumption, and seed. Seed potatoes are stored in a dark, well-ventilated room for 5-6 months. The second selection occurs just before planting (usually the day before). Only potatoes with eyes, showing signs of germination, and which are completely free of damage will be chosen. If large potatoes are used, they are normally cut in half--but making sure that each half has at least one germinated eye; otherwise, medium-sized potatoes are generally used for seed. In preparing the seed, all germinated roots are rubbed off with the fingers. This is intended to speed germination once the seed is in the ground. Were the roots not removed, they would first have to rot off before new roots could be formed from the same eyes.

PLANTING TASKS

Planting miskha potatoes in Melga is a very labor-intensive task. At a minimum, no less than five laborers are required along with one team of oxen. For larger properties, or when planting must be completed as quickly as possible, it is not uncommon to use 2-3 yuntas (ox-teams) and a planting party consisting of a dozen or more participants. For this reason, virtually all households must recruit outside workers for planting--either on a paid or labor exchange basis. This must be done several days or even weeks in advance to assure that the required laborers and draft animals will be available when needed.

On planting day the rural household rises early, usually before 6 A.M. The female head-of-household faces a particularly demanding schedule of activities. She must first prepare breakfast for her family. She must next start to cook the almuerzo or hot, "wet" meal that will be eaten by family members before departing for the planting site. While the almuerzo is cooking, the housewife is also expected to feed the draft animals their abundant pre-plowing rations; this fodder--depending on the season--will consist of barley or green oats, weeds, potato stalks, or corn silage. After the almuerzo is served, the housewife immediately proceeds to prepare the samay or mid-day meal to be served to hired and family laborers in the field. She must also prepare and pack for transit the following items: plates and eating utensils, cooking pots, food, chicha (corn beer), the ingredients for the burnt offering to the Pachamama (Earth Mother), cooking fuel (if necessary), and fodder for the mid-day meal of the draft animals. The woman is also expected to lead the oxen to the field, assist with the attaching of the yoke and plow, conduct the burnt offering, prepare all required food, and still participate as a seed planter throughout the day. It is her husband's responsibility to make sure all necessary sacks and planting tools are in good repair. He must be certain that his plow sets are complete, that plowshafts and handtools are sharp. He is responsible for the logistics of getting fertilizer, manure, and seed supplies transported to the planting site and distributed at even distances about the field.

Once the planting party assembles at the work site, it is customary to conduct a ritual sacrifice to the Pachamama. Known as the khohada, this ceremony is conducted only before the planting of potatoes and not habas, oats, wheat, corn, or other crops (since potatoes provide the single most important source of cash income). The offering contains a pre-packaged mesa dulce consisting of khoha (a chopped herb mixed with grease), incense,

small wafers in different colors, some coca leaves, and a black tobacco cigarette. These ingredients are burned inside a ceramic dish placed at the center of the field. Members of the planting party gather around this offering in a semi-circle. They chew coca and smoke a cigarette. Then, kneeling on the ground with their hats removed and their gaze toward the heavens, they ask for a successful planting and a bountiful harvest. Each participant is given a small glass of Singani (grape brandy) or a gourd filled with chicha (corn beer). Before drinking, the worker must spill the first drops on the ground--in the form of a cross--for the consumption of the Earth Mother. Each participant then speaks his own toast, for example: "Let this field produce a truckload"; or "Let our home overflow with potatoes"; or "Let each potato weigh a pound"; or "Keep me from growing tired in today's laborers", etc.

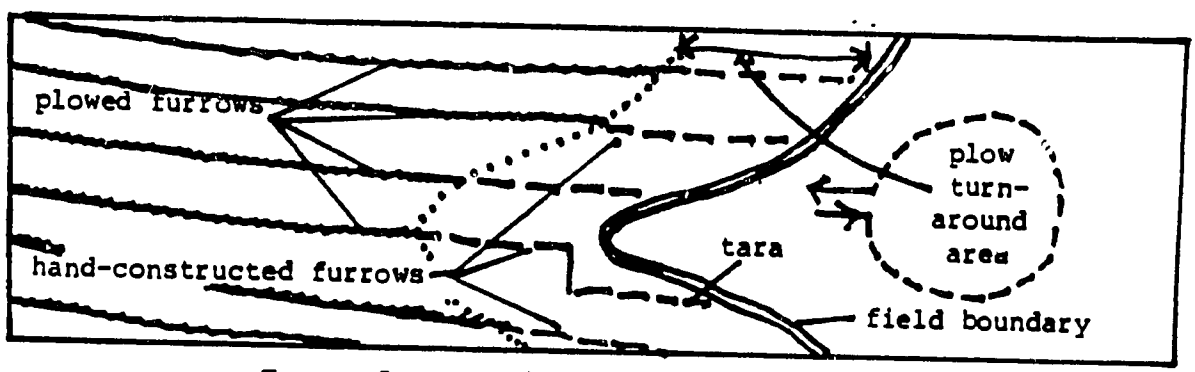
Only after all members of the planting party have toasted the Earth Mother and trunk their beverage can the day's work begin. The planting process resembles a procession. First come the yunta or ox-team pulling the wooden plow. The plowman guides the plow by its handle with his right hand, a stick or whip in his left. It is truly extraordinary the degree of furrowing precision that can be achieved by an experienced plowman using such a simple plowing instrument, on a steep hillside, behind heavy and sometimes unruly draft animals. The plowman must control furrow depth within a range of about 18-25 centimeters. Furthermore, although plowed on the contour of the slope, the furrows themselves should have a slight slope to facilitate future irrigations.

Behind the plowman walks the planter. She carries a seed bag around her waist or slung from her shoulder. Extracting seed with both hands, she drops one seed with every step she takes. The seed is released from a height of one meter above the furrow, yet it lands with a precise spacing of 20-30 centimeters. If the seed is quite small, two seeds at a time may be planted.

The Planting Procession

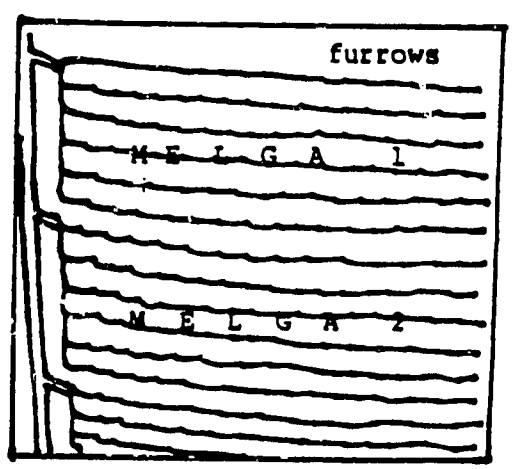
After the planter comes the guanero or manure spreader. He carries a sack slung from his shoulder and shakes its contents into the furrow in an even stream. Behind the guanero comes the quimiquero or spreader of chemical fertilizer. The fertilizer is removed one handful at a time and spread by a gentle broadcast motion along the furrow.

The fifth member of the planting party is the chujchuquero, who is named after the digging-hoe he uses which is known as the chujchuka (ox tongue). His responsibility consists in lengthening the furrows at each field boundary. This is necessary because the wooden plow must be removed from the ground 1-2 meters before the field boundary is reached in order to allow space for the ox-team to turn around. The process of completing furrows by hand is known as chijchipear. Because field boundaries are frequently uneven or eaten away here and there by erosion, it is often necessary for the chujchukero to construct a parallel furrow known as a tara. When all furrows have been seeded and buried, it is also the chujchukero's responsibility to construct access ditches so that the furrows can be irrigated by gravity flow.



Furrow Construction at Field Boundaries

Basically, there exist two furrowing techniques. The first is to plow, seed, fertilize, and bury each furrow one at a time. The second and most common method is plow, seed, and fertilize a set of furrows--known as a melga--and then bury it as a unit. A melga consists of a section of field about 4-5 meters wide or about 8-10 separate furrows. As will be seen presently, melgas are irrigation units containing furrows that are irrigated simultaneously. In either case, seeded furrows are buried by cutting a parallel furrow about 30 centimeters to the (uphill) side of the original furrow, which push-



Construction of Melgas

es over dirt to bury the seed and fertilizer lying just below. Some farmers use a second team of oxen--which follows behind the planting procession--to bury individual seeded furrows or legas. Once the entire field has been planted, many farmers prefer to conduct a final leveling of the soil surface using the T-shaped rodillo. This task helps to destroy dirt clods, to assure that all seeded furrows are well-buried, and to facilitate post-planting irrigations.

CULTIVATION TASKS

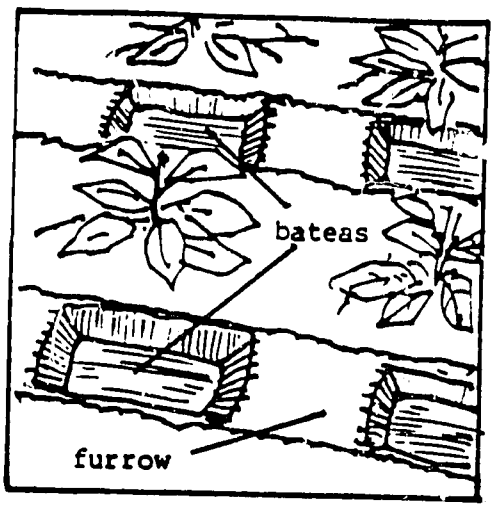
It takes about a month for the young potato plants to break through the soil surface. This will take longer in rocky or heavy clay soils than in sandy, porous soils. About six days after the first plants appear ir is time to conduct the first post-planting irrigation or k'aspeo. This soaking is obviously intended to stimulate plant growth, but it also tells the farmer how well or badly his furrows have been constructed. By carefully studying the drainage and puddling patterns left by the water, the farmer will be able to determine which furrows are too steep, which too flat, and in what places are furrows breaking down or erosion occuring. These deficiencies will then be corrected by hand during the subsequent hilling tasks.

About six days after the first irrigation, it is time to conduct the jallmeo or primer aporque (first hilling). At this time the plants will be about 10-15 centimeters in height . The task can be conducted with either the chujchuka or ordinary hoe, but these tools must be well-sharpened so as to cut easily through the soil crust that has hardened following the first irrigation. In this task the dirt is loosened, broken up, and piled in a 20-35 centimeter radius around each plant. If any weeds or grasses have grown up since the initial tillaging tasks were conducted, they should be removed by hand. At the same time, furrows may have to be reshaped to alleviate deficiencies in the delivery of irrigation water.

Upon completion of the first hilling it is time to irrigate again. This second irrigation should come about nine days after the first. Once again the farmer has an opportunity to study water flow patterns and identify irrigation deficiencies. These he will repair during the second hilling, which is known as the aporque grande or jatun jallmay. Like the first hilling, this task is also conducted with the chujchuka. But this time it is customary to construct shallow, rectangular-shaped indentations at varying intervals along the floor of the furrow. These are known as bateas. Where the slope is steeper, the bateas are dug closer together. Their purpose is to cause the water of subsequent irrigations to puddle, thereby slowing its velocity and producing a deeper soaking of the soil. The dirt removed

from the bateas is heaped around the base of the plants to make sure the future potatoes--which grow close to the soil surface--are well-covered. Young potatoes exposed to sunlight before they are harvested will turn a greenish color and their skins will peel, thereby ruining their marketability.

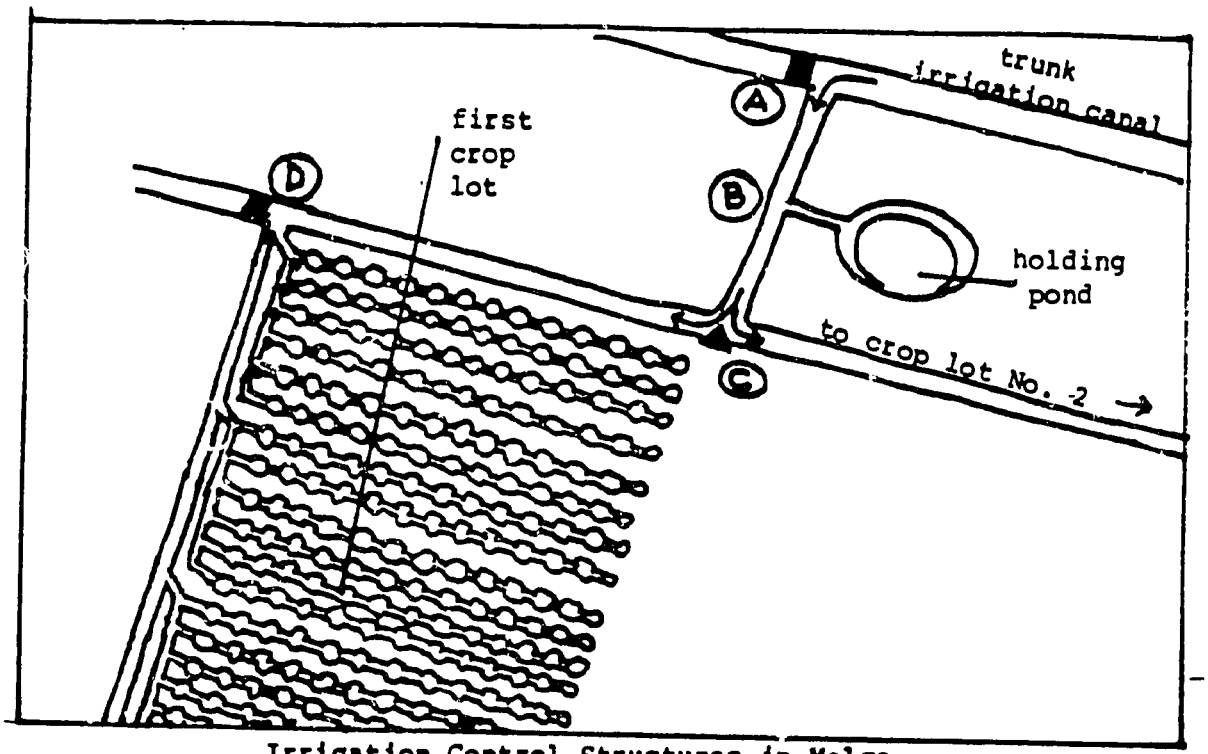
Immediately following the jatun jallmay, another irrigation will be conducted. In the absence of natural rainfall, irrigations will be continued at roughly nine-day intervals for the duration of the growing season.



Bateas for Water Control

The precision and efficiency with which farmers in Melga control water is quite remarkable and therefore merits further explanation here. The use of bateas represents the tail end of a simple yet sophisticated water control system. The system begins with a mita or water turn. Each farm household belongs to a list of water users. For any given irrigation season, the family knows how frequently it can expect to receive its river water turn, how frequently its reservoir water turn, and how many hours each turn will last. Depending on total water volume expected, the farmer will elect to irrigate two or more crop lots simultaneously.

At the appointed hour his water turn begins, the farmer dams up the irrigation trunk canal (point A in the diagram below). This routes the entire available water volume into his access canal system. If the farmer does not need the full volume, he will place an appropriate sized rock in his access canal to divert part of the water flow into his holding pond (point B). Now then, if two crop lots are to be irrigated simultaneously, the farmer will place another rock at the distribution point of his access canal (point C), which will exactly divide the available water flow into two equal smaller flows. When the water reaches the crop lot, a third rock is placed at point D, forcing the water into the first melga. Progressively smaller stones are placed below the openings into the furrows within the melga, which further subdivides the waterflow into equal amounts for each furrow. The water then advances down each furrow--pausing to puddle inside each batea--and slowly works its way to the end. At this instant the entrance to the melga is sealed off with a stone or shovelful of dirt and the water diverted down into the access canal for the next melga. This process of placing and removing stones of different sizes continues until the irrigation of one or more plots has been completed. Should it happen that the irrigation is completed before the end of one's water turn, the farmer will dam up his access canal at point B and use his available surplus to fill his holding pond.



Irrigation Control Structures in Melga

FUMIGATIONS

Miskha potatoes in Melga are usually fumigated on two occasions. The first fumigation follows the second hilling or aporque grande. The preferred insecticide is liquid Perfektion, which is applied in the proportion of one capful per ten liters of water. This solution is mixed inside the plastic or metal tank of a backpack sprayer known as a mochila. Some farmers mix abono foliar or leaf fertilizer with their insecticide solutions in the proportion of 6-8 parts abono foliar for one part of Perfektion. The second fumigation occurs at flowering, or about one month after the first. In the case of the miskha crops planted in June, July, and August (i.e., the chaupi miskha or middle planting), it is necessary to fumigate more than twice because the warmer weather causes an intensification of insect infestation. The principal insectfarmers seek to control with these fumigations are the khuritos: small leaf-eating larva colored red, green, and yellow. A second threat to the potato plant--because it eats both the roots and the tubers--is the lakatu or earthworm. However, external applications of insecticide cause little harm to this pest; [illegible] threat is best minimized by soil tillaging and timely harves[illegible] produce.

HARVESTING TASKS

CUTTING THE STALKS

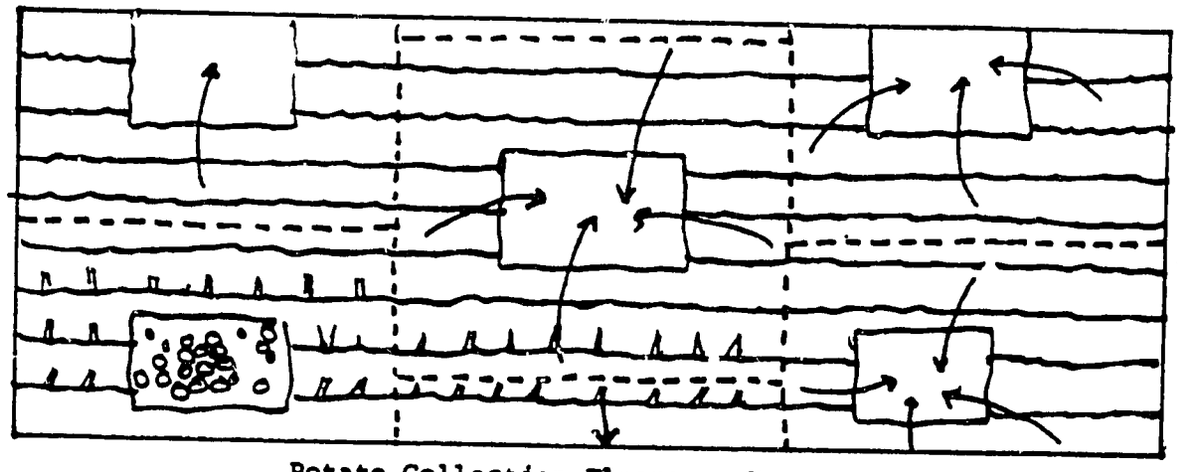
With miskha potatoes it is customary to cut the plant stalks when these begin to yellow or roughly 2-3 weeks before the harvesting itself. This pre-harvest task is known as the corte de aylinco while the cutting is described by the verb aylinquear. The corte is conducted with a small hand sickle or hoz. The stalks are cut about five centimeters above the level of the soil, just enough to allow harvesters to identify plant locations to guide their digging. The rationale for the stalk cutting is threefold. First, by cutting off the above-ground portion of the plant it is believed that the practically-mature tubers will now adsorb virtually all remaining moisture and nutrients, thereby making for larger and heavier produce. Second, the plant stalks make excellent forrage for livestock, particularly oxen. And third, stalk removal makes it easier to spot tubers when the digging begins.

The corte de aylinco is a task reserved exclusively for family labor, usually women. Moreover, it is conducted over a period of several days and sometimes up to two weeks, but only for a few minutes each day. This allows the plant stalks to be consumed gradually by livestock. Families without livestock to consume the stalks will often invite a neighbor to conduct the cutting and make use of the aylinco, perhaps in expectation of receiving a future favor.

DIGGING THE POTATOES

Miskha potatoes do not have the same storability as those grown under rainfed conditions; thus, they are produced almost entirely for market sale. Accordingly, harvesting occurs 1-2 days before the family plans to market the potatoes. For example, if the produce is to be sold at the Sacaba sunday market, it may be dug up on the preceeding friday or saturday. Furthermore, the family will usually only dig on any given day that quantity of produce which it expects to sell immediately. For this same reason, it is likely that a single plot of potatoes will be harvested over two or more days, and each digging may be separated by a period of one to two weeks. Finally, the piecemeal harvesting operations described above usually allow the digging to be conducted entirely with family labor.

The digging of potatoes is always preceeded by a khohada (burnt offering) and a ch'alla (libation) to the Earth Mother. Once this ritual has been completed, the next step is to construct a series of kayanas or potato collection floors at equally-spaced locations about the plot to be harvested. Each kayana will be a flat, rectangular space about one meter wide by 1.5 to 2 meters long. It will have a capacity to hold about one carga (225 pounds) of potatoes. Furthermore, because the kayanas are of equal size and equally-spaced, each one corresponds to a roughly equal area of the field to be harvested. Thus, to determine the harvest task area assigned to each worker, one only counts the number of kayanas he is expected to fill, not the number of rows or area of field he is expected to dig.



Potato Collection Floors or Kayanas

The digging of potatoes is conducted with the chujchuka. Use of the ox-drawn plow is only considered permisible if the harvest is extremely poor. There exists a local belief that mature potatoes "resent" the plow and will punish the plowman by refusing (as seed) to produce another crop. Although considered a simple and routine task, digging potatoes requires considerable precision to avoid damaging the tubers themselves. The harvester stands to one side of the furrow, locates the center of the plant (by its stalk stub), gives two fairly wide and deep blows with his digging hoe on each side of the plant to loosen the dirt and root system, and finally delivers a third blow beneath the plant to pull it up and expose the tubers. Then, leaning the handle of his chujchuka against one leg, the harvester uses both hands to work through the soil and collect the potatoes. These he tosses into his nearest kayana. Depending on his position relative to the kayana, the harvester may toss the potatoes straight ahead, or through his legs, or to one side or another. Women and children--called kayaneras--follow behind helping to assemble and pile the produce destined for each kayana since the toss of the harvesters is not always precise. A common form of harvest amusement is for harvesters to playfully toss a potato now and then at the kayanera rather than the kayana, and the kayaneras similarly barrage the

harvesters.

At mid-morning the digging temporarily stops while the harvesters enjoy a rest period. At this time they drink some chicha to alleviate their ch'aqui or thirst and chew some coca to alleviate fatigue and hunger. Each coca chewing throughout the day is known as a pego de coca, literally a "shot of coca". At about 2 P.M. the work stops for about an hour's rest so that harvesters can eat the samay or mid-day "dry" meal. This will usually consist of phuti de chuño (steamed chuño) or phuti de fideo (noodles) combined with a spicy peanut sauce. If hired laborers are involved, the samay will usually be a special meal containing roast meat or poultry. When the digging of a field has been completed, it is customary to celebrate the event with final libations and prayers of gratitude to the Earth Mother.

POTATO SELECTION AND MARKETING

Once the digging is concluded, the contents of the kayanas are emptied into a single large pile at one end of the field. From this pile--containing produce of all sizes--the potatoes are selected into quality categories according to size. The task is normally conducted by women. In some instances, the kayaneras conduct the selection process while the harvest is still in progress, grading one kayana at a time. There are four principal categories of potatoes, as follows: (1) chaparas or the very largest potatoes, reserved for family consumption on special occasions or for gifts to esteemed friends; (2) kolke or first-class (largest) sale potatoes; (3) murmu or medium size sale potatoes; and (4) chili or small size potatoes, for sale or family consumption. Some households conduct a more refined selection by dividing their produce into seven or more classes including kolke murmu, chili murmu, and potatoes for seed. There exists a custom of placing a heavy stone on top of the pile of kolke potatoes. This is intended to increase the weight of these first-class potatoes prior to market sale.

Almost all miskha potatoes from Melga are sold in either of two markets: the Cochabamba Market on wednesdays and saturdays, and the Sacaba Market on sundays. In Cochabamba the produce is sold by cargas of 8 arrobas each (200 pounds) while in Sacaba the potatoes are sold by cargas of 9 arrobas (225 pounds) and by single arrobas (25 pounds). Transactions involving one or more cargas are normally conducted with rank'eras or intermediaries. Retail sales directly to consumers by the producers themselves are permitted, but the sellers must pay a market tax or alcabala and a rental fee or sentaje for the space they occupy at the market site. While most market sales of potatoes are made on a cash basis, it is not uncommon for producers from different regions to conclude barter transactions--for example, potatoes in exchange for ceramics or fruit. Virtually all marketing of potatoes from Melga is conducted by women.

RAINFED POTATOES
WATA TARPUY: A SUMMARY OF CROP PERFORMANCE
(EUSEBIO CASTRO: NOVEMBER 1979 TO JUNE 1980)

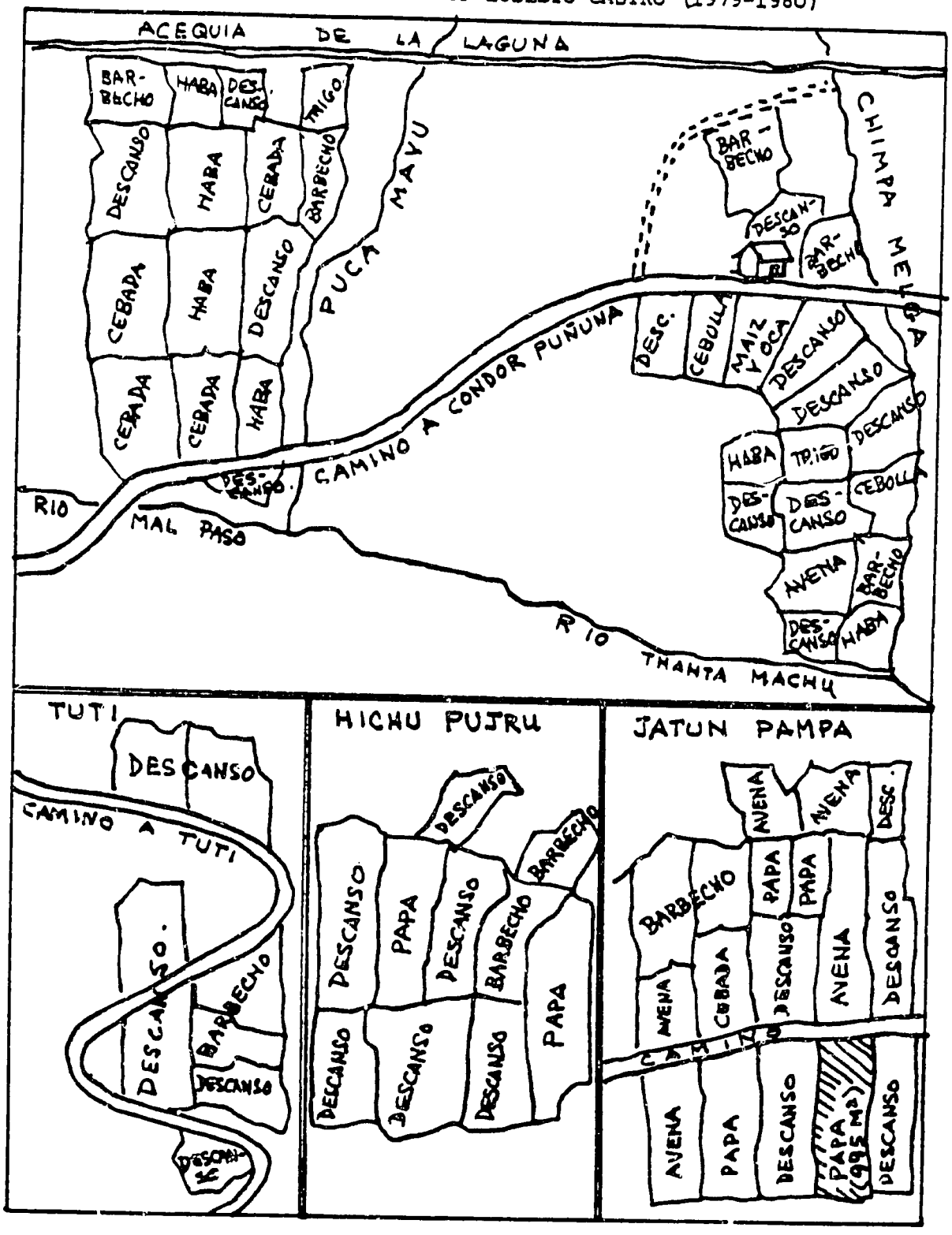
The household of Eusebio Castro controls no less than 68 crop lots which collectively total slightly more than five hectares. As shown on the map on the following page, these plots are located in five separate districts of Melga: Puca Mayu (15 plots), Chimpa Melga (18 plots), Tuti (8 plots), Hichu-Pujru (10 plots) and Jatun Pampa (17 plots). At the time his properties were surveyed in 1980, Eusebio Castro had 29 plots (43 percent) of his cropland in fallow, 11 plots in barbecho or plowing stage for 1980 plantings, and 28 plots planted to different crops during the 1979-1980 agricultural year. Of these 28 plots, there were six of potatoes, six of habas, six of oats, five of barley, two of onions, two of wheat, and one of corn mixed with oca.

AREA PLANTED AND SEED USE: Four of Eusebio's six potato plots were planted in the highland zone of Jatun Pampa and grown exclusively under rainfed conditions. The plot to be described here measured 995 square meters in area. In 1979 this plot lay in fallow (descanso) and in 1981 it was planted to oats (avena). On October 19, 1979 the plot was planted with 1.5 cargas (338 pounds) of potato seed of the variety Imilla Blanca. He also applied 15 quintales (1,500 pounds) of sheep manure and one arroba (25 pounds) of chemical fertilizer.

LABOR AND ANIMAL USE, BY STAGES: There exists no record of land preparation, and the date the barbecho was initiated is unknown. The Castro household did spend four days of labor, on two separate trips, to haul manure to the planting site on burros. During planting, a day of yunta and six days of family labor were employed. Between planting and harvest the plot was hilled twice (at 49 and 68 days after planting) and fumigated three times (at 52, 59, and 75 days after planting. A total of 11 days of family labor, one day of oxen, 1.5 liters of Perfektion, and a half liter of leaf fertilizer were employed in these tasks. The harvest was initiated 148 days after planting. The digging took place on four separate days between April and June. It required 10 days of family labor and two burros to carry the harvested produce back home.

PRODUCTION AND INCOME: The Jatun Pampa plot produced a total of ten cargas (2,250 pounds) of potatoes, or a return of 6.6 times the quantity of seed used. Excluding family labor costs, the total expenses for the crop came to 2,740 pesos or US$110. The total estimated value of the harvest was 5,000 pesos or US$200, yielding a net income of 2,260 pesos or US$90. This amounted to 72.90 pesos (US$2.92) for each day of family labor utilized, or about 46 percent more than the prevailing wage rate for hired labor.

CROP LOTS AND LAND USE OF EUSEBIO CASTRO (1979-1980)



GROWING RAINFED POTATOES

Growing rainfed potatoes is different from miskha crops in a number of ways. For one thing, the wata tarpuy crop requires considerably less labor for a variety of reasons. First, there is no need for irrigations. Second, because water control is not a problem, hilling tasks are less complicated and can be conducted with oxen. Third, the highland location of rainfed crops as well as the absence of routine irrigations results in less weed growth, which further simplifies the aporques (hillings) of wata tarpuy crops. And finally, there is no cutting of plant stalks in rainfed potato plots--perhaps because it is too inconvenient to do so since the highland production zone is located some eight kilometers from the community of Melga. On the average, then, a household will invest between one-fourth and one-third less labor in a rainfed potato crop than in a miskha plot of equivalent size.

In addition to lower labor costs, another major advantage of rainfed potatoes is that they usually provide higher yields--for equal areas planted --than miskha potatoes. For every pound of seed planted to rainfed potatoes, the farmer can expect about 7-8 pounds of harvested produce. Unfortunately, this advantage is somewhat neutralized by the fact that potato prices are significantly lower when the rainfed crop is harvested (in April, May, and June) than when the bulk of the miskha potatoes are sold (in October and December-January. For example, the average price per carga of miskha potatoes was about 700 pesos (US$28) in October 1980 as opposed to an average rainfed potato price of 500 pesos (US$20) per carga only five months earlier--a difference of 40 percent. Since rainfed potatoes can be stored longer than miskha potatoes, it would be in the interest of the farm household to store its marketable surplus of rainfed potatoes until late in the year. However, most families cannot afford to wait that long. The majority need to sell their rainfed potatoes quickly in order to finance investments in miskha potatoes and other crops.

A final difference between wata tarpuy and miskha crops is this: even though rainfed potatoes require less labor and less frequent labor investments, their planting and harvesting entail very complicated logistics and considerable inconvenience for the farm family because the highland production zone is so far away from most homes in Melga. To illustrate this point, we present excerpts from an interview conducted with Margarita Espinoza on May 6, 1981.

"...This year more than ever we have reason to celebrate, because we all planted more than we usually do here in Parina (the highland production zone for rainfed crops). But the bad part is that potato prices are very low, so we probably won't make much money from this harvest. So much work it cost us too! Last week I had to move my entire household up here. We had to hire a truck because it's so far and I was bringing bedding, shelter, pots, tools, and food for the entire week for ourselves and our hired laborers. It's not easy. I even brought my grinding stone. We built a chujlla (hut or shelter) from oatstraw. We had borrowed a tarpaulin to make a tent, but it was too cold; the straw shelter was much warmer. But it got so cold up here we almost couldn't stand it. Our skin dried out, and our fingers were so stiff from the digging that sometimes it was almost impossible to hold the tools in our hands. The cold up here in Parina is always very intense at harvest. The wind blows hard all the time. We have been digging for a whole week (in different plots). Since the tent was too cold for us, we used it to temporarily store the potatoes we were harvesting."

"...Every single day I have to cook for my family as well as the workers. This includes the desayuno (early breakfast), almuerzo (late breakfast), samay (mid-day meal), and cena (supper). I have my babies with me here too. I also help the men with the digging, or I collect and sort the potatoes they dig."

"My kitchen I set up there--in the open pampa--using rocks to make the stove. I brought with me leña (fuelwood) from down below, because up here there's nothing. We have suffered a lot preparing meals. With the wind, dirt blows into everything. There is nothing to be done about it; we just had to endure. Our workers were not satisfied with papa huayku (boiled potatoes with their skins), so I had to cook noodles and rice and squash. One day--on Sunday--I cooked two chickens. The workers demanded it, because they said May 1st was the Day of the Laborer and so they deserved something special, so I promised them the meal for La Cruz (May 3rd). They also demanded chicha every day for their ch'aqui (thirst). Without chicha they refused to work; it's the first thing workers ask for. And these days they earn a good wage as well. For each day of work we pay them one quarter of a tupu (a sack containing about nine arrobas or 225 pounds), which is more or less two arrobas (50 pounds) per day, and in four days they earn a complete tupu of unselected potatoes, both large and small. Let's say each arroba is worth 50 pesos (US$2); that means each day they earn 100 pesos (US$4) plus all their food and chicha and coca. During the week eight men and two women worked for us, not including myself. I think we have paid about ten tupus just for wages."

"...We paid the women the same as the men. They do the same work. Digging potatoes in this cold is torture. Other families pay women laborers only half what we pay, but with us it's the same wage for everybody."

"...We planted eight cargas (1,800 pounds) up here this year, and now--without counting what we paid in wages--they say we have harvested an entire truckload, about 150 quintales (15,000 pounds). But the price is so cheap. They are not paying any more than 600 pesos (US$24) for a carga of first-class potatoes. Everybody has a lot of potatoes now. The crop has produced like never before."

"...In the miskha we sell at a much better price, but we don't plant such large areas. But in the wata tarpuy we have a large planting, enough for ourselves and also to sell so we can buy things we need....Both crops require the same amount of work: the yearly crop because it's so far from our homes, the miskha because we have to irrigate it continually. The miskha always requires more attention."

"...Which one do I prefer? Both are the same. If there is work to be done we just have to do it. How could we be choosing? Here in the country we survive from our work; and if we didn't work, what would we eat? Those who earn salaries can support themselves without working the land, but our lives are different. There is always work for us--whether it is sunny or rainy or freezing cold. We can't say "today I won't work", because if we delay our tasks it is too late and the loss is entirely ours. It's just not worth it. We can't afford to be choosy."

POTATOES IN PUCA PUCA AND HUAYCULI

Given the central importance of potatoes in their daily diet, practically all farm households in Puca Puca and Huayculí attempt to grow this crop --even though the chances of a successful harvest are not good. With very few exceptions, potatoes are grown under rainfed conditions during the normal agricultural cycle of October-November through April. Rainfall is too uncertain for farmers to risk large plantings; what they do grow is destined almost exclusively for family consumption, and potato plots seldom exceed a total area of a quarter-hectare per household. When the rains arrive late, or are inadequate in frequency and quantity, the rural household stands to lose considerably more than its expensive investments in potato seed, animal manure, and labor. In addition, the male head-of-household (particularly in Puca Puca) may have to abandon his family for several weeks to work as a hired laborer in the highland potato harvests, which pay workers a daily wage of two arrobas (50 pounds) of produce per day.

In addition to their greater dependence on rainfall, their smaller plots, and their subsistence orientation, potato growers in Puca Puca and Huayculi display additional differences with their counterparts in Melga with regard to this crop. A number of these differences are identified below, by separate stages in the production process.

LAND PREPARATION

In Puca Puca, all land preparation tasks are conducted with the ox-drawn wooden plow. Thus, the barbecho tillages can not begin until the arrival of the first rains in October or November. Following the first rain, normally two tillages or rejas will be possible--the initial levantada (lifting) followed by the volteo (turning), which is conducted at a right angle to the first plowing. For his third tillaging, the farmer must await another rain. In heavy or grassy soils, a fourth and fifth tillaging may be required. Even so, when all necessary tillages are completed, the farmer must wait for still another rain--known as the empanto (soaking)--before planting can be undertaken.

In Huayculí the land preparation process begins about six months earlier --in March or April, at the end of the rainy season. Because their land is quite flat, many Huayculí farmers elect to prepare the soil with a tractor rather than the ox-drawn wooden plow. The tractor can complete in an hour what will take three days with yunta. Following the tractor plowing it is still customary to conduct a final tillage with the wooden plow. This is followed by a leveling and pulverizing of the clods by dragging a heavy trunk across the entire surface of the field--a task known as umbraleada (threshold timbering). The soil is then left untouched until furrowed and planted in October or November. For those farmers who can not afford tractor services, between three and four tillages will usually be conducted with the ox-drawn plow. The first two--the levantada and the volteada--will be conducted within 2-3 days of each other, also early in the year when the soil is still humid. The twice-tillaged soil will then be left to "air" for about two weeks before completing the third plowing, which is known as the revuelta (returning) or kutiykuna in Quechua. The day after the third plowing it will be necessary to conduct the umbraleada, as described above. If there occurs a period of rain within the next few months (between June and August), some farmers will plow a fourth time as well. This is known as the cerrada (closing) or wisk'ay in Quechua.

PLANTING

In both Puca Puca and Huayculí the predominant potato variety used is not Imilla Blanca but Runa, which is more resistant to drought and matures more rapidly. Most households do not grow their own seed but rather prefer to purchase or barter for it with the alteños (highland farmers). Because planting requires a previous rain to soften and moisten the soil, planting dates are highly variable. As a general guideline, the celebration of All Saint's Day (November 1st) is considered the start of the planting season. However, some years planting may begin in early October while in others the potato crop may not be planted until near Christmas.

Because their potato crops are not irrigated, farmers in Puca Puca and Huayculí are unlikely to construct melgas (groups of furrows constituting irrigation units). Instead, each furrow will be opened, planted, fertilized, and then burried by cutting a parallel furrow before starting the next furrow destined for seeding. In Puca Puca it is customary--during the seed selection process--to leave the germinated roots attached to the seeds and planted intact. In Huayculí, however, these roots are removed before planting. Nonetheless, Huayculí is quite unique in that only men do the planting; and in this community the planter is identified as a mujero (literally, a masculinization of the word "woman"). Unlike Melga,

where the planter walks beside the furrow dropping her seeds and does not step on the seeds themselves, in Puca Puca and Huayculí the seed is stepped on. This stepping on the seed occurs before the furrow is fertilized with manure, and it is so intentional that in Huayculí it has been elevated to the status of a separate and specialized planting task. In that community the third member of the planting procession--following behind the mujero--will be a child who has the twin responsibilities of (1) moving to the center of the furrow any seeds that have fallen out of place, and (2) burying each seed with a gentle footstep.

Farmers in Puca Puca and Huayculí generally do not use chemical fertilizers on their potato crop. Obviously, given the greater risks they face in rainfed agriculture, the cash outlays required to purchase chemical fertilizer are not considered justifiable. More importantly, it is a widely held belief in rural Bolivia that chemical fertilizer will burn rather than benefit the plant unless abundant water is available to dissolve the chemicals. Nonetheless, to compensate for their non-use of chemical fertilizer, farmers in Huayculi and Puca Puca generally apply much more animal manure to their potato crops than do growers in Melga. In fact, whereas the latter add about 500 pounds of manure for every 100 pounds of potato seed, their colleagues from the more arid communities apply almost twice that amount. The dung of sheep, goats, cattle, and even burros may be used, depending on what livestock resources each family has at its disposal. It is roughly calculated that a single sheep will produce a carga (200 pounds) of manure in the space of a year. To plant a single tupu (217 pounds) of potato seed, farmers in Huayculí recommend the use of 12-15 cargas (2,400-3,000 pounds) of manure. Some families with inadequate manure resources will mix these materials with vegetative matter to create a simple compost. In Huayculí, it is common for families to mix the ashes from their pottery ovens with animal manure so that their fertilizer stock will go further.

Irregardless of the exact proportions, potato crops in Puca Puca and Huayculí are heavily fertilized, and this investment constitutes a major commitment of family resources. One might well question if it is rational for the farm household to risk such a large investment on a rainfed potato crop that is more vulnerable to drought than corn or wheat. The truth is, the investment is not just made for potatoes. In the first place, it is customary for farmers in Puca Puca and Melga to plant a variety of other plants among their potato crop. These include squash, gourds, peanuts, corn, watermelons, and others. Some are planted at intervals of 4-5 meters within the same furrow as the potatoes; others are planted at similar intervals in the intermediate furrows--that is, those cut parallel to bury the originally seeded furrow. Furthermore, a heavy fertilization of potatoes in one year is often considered a three-year investment in a crop sequence that begins with potatoes and is followed by corn and then wheat.

CULTIVATION TASKS

In Puca Puca and Huayculí it is more common for hillings of the potato crop to be conducted with the wooden plow rather than by hand. Furthermore, there are usually three hillings instead of two--a practice which enhances the maintenence of soil humidity. The first hilling--known as the k'achida--comes about six weeks after planting (or two weeks after sprouting), when the plants are 15-20 centimeters high. The second hilling or chaupida is completed about three weeks after the first. The final hilling--known as the kunkada or apaqeay--is completed some 12 weeks or 85-90 days after planting, when the crop has begun to flower. When the yunta is used for hilling, it is important to make sure that plants are not buried completely with dirt. For this reason it is customary for the plowman to be followed by a woman or child. The assignment of this companion is to "rescue" plants covered too deeply with soil, and also to remove by hand all loose weeds and grasses they encounter.

Between the second and third hillings it is usually necessary to conduct a fumigation of the potato crop. As in Melga, farmers of Puca Puca and Huayculí also prefer to mix a leaf fertilizer with their chemical insecticide--a practice designed to promote flowering. On the other hand, many producers do not own a backpack sprayer. Instead, they improvise by mixing the chemicals with buckets of water; they then use a small broom or clump of bound weeds as their applicator. With such simple implements they "throw" the solution at one plant after another, much like a priest sprinkling holy water on his parishioners. Of course, this makes the fumigation task much more time consuming since the spray from a backpack fumigator can usually cover 2-3 rows at a time.

Although potatoes in Puca Puca and Huayculí are grown under rainfed conditions, and the primary problem is one of water scarcity, this does not mean that farmers can ignore water control techniques. To the contrary, rainfall may be scarce when measured over the growing season but any single rainstorm can easily bring too much water, resulting in flooding. The single ailment in potato plants that farmers most worry about in these arid communities is thojtu, a blight caused by excess humidity which causes potato plants to become scorched and their tubers to turn hard as rocks before rotting in the ground. To avoid such results, farmers treat each heavy rainfall as if it were an irrigation turn: they go to their fields, stand watch for the first signs of flooding, and construct instantly (as needed) any drainage ditches that may be required

to keep excess water from puddling in the furrows. At the other extreme, when drought prevails, farmers attempt to preserve scarce soil moisture by special tillaging techniques. For example, if a dry year is expected, it is customary--upon seeding a furrow with potatoes--to bury it with not one but two parallel furrows, one on each side, a practice known as entierro con tres surcos (three furrow burial). In effect, the additional furrow results in a flattening of the soil surface, reduces ventilation, and traps humidity in the soil more effectively. Another practice, most common as the potato crop nears the flowering stage, is to construct bateas (basins) in the furrows separating each row of plants to puddle rain water for deeper and more prolonged soakings of the crop.

HARVESTING

For the most part, farmers in Puca Puca and Huayculí do not bother to conduct the pre-harvest corte de aylinco (cutting of plant stalks) unless they have an acute need for fodder for their livestock. As for the harvest itself, the digging is conducted with much the same technique as in Melga. However, the hoe is preferred to the chujchuka as a digging implement. Then too, given the smaller size of their potato plots, farmers usually do not bother to construct cayanas or collection floors at different locations throughout the field; instead, they load produce directly into baskets. When each basket is filled, its contents are taken to the edge of the field and spilled onto a single collection pile or phina.

Furthermore, since farmers in Puca Puca and Huayculí harvest potatoes for their own consumption rather than market sale, the timing and sequence of the digging is quite different than in Melga. The normal pattern is for family labor to begin the digging even before the tubers are completely ripe, but usually no more than a few plants (less than a basketful) will be harvested on any single day--just enough to meet immediate family consumption needs. This kind of harvesting may continue from the end of the flowering stage until the crop has dried completely and its leaves have dropped. Only then will the balance of the available produce be dug up in a single day.

Potatoes are classified into four principal categories--chaparas, kolke, murmu, and chili--as in Melga. They are then stored separately in adobe bins called pirhuas. In many homes the family sleeps on beds constructed on top of such storage bins; these beds are called estrados. The potatoes are placed inside the bin without a layer of straw, and the adobe walls should be perforated with a variety of holes to permit adequate ventilation. Under these conditions, potatoes and other home-grown produce are expected to last until the following year's harvest.

CORN IN PUCA PUCA
HILARION QUIROZ (1979-1980)

Corn is the primary crop of Puca Puca, and about 80 percent of the community's cultivated land is devoted to this cereal. Some varieties are grown exclusively for home consumption as mote (boiled corn) or tostado (toasted corn), others for the making of chicha (corn beer). But the predominant variety is Maiz Amarillo, which is largely destined for market sale or barter.

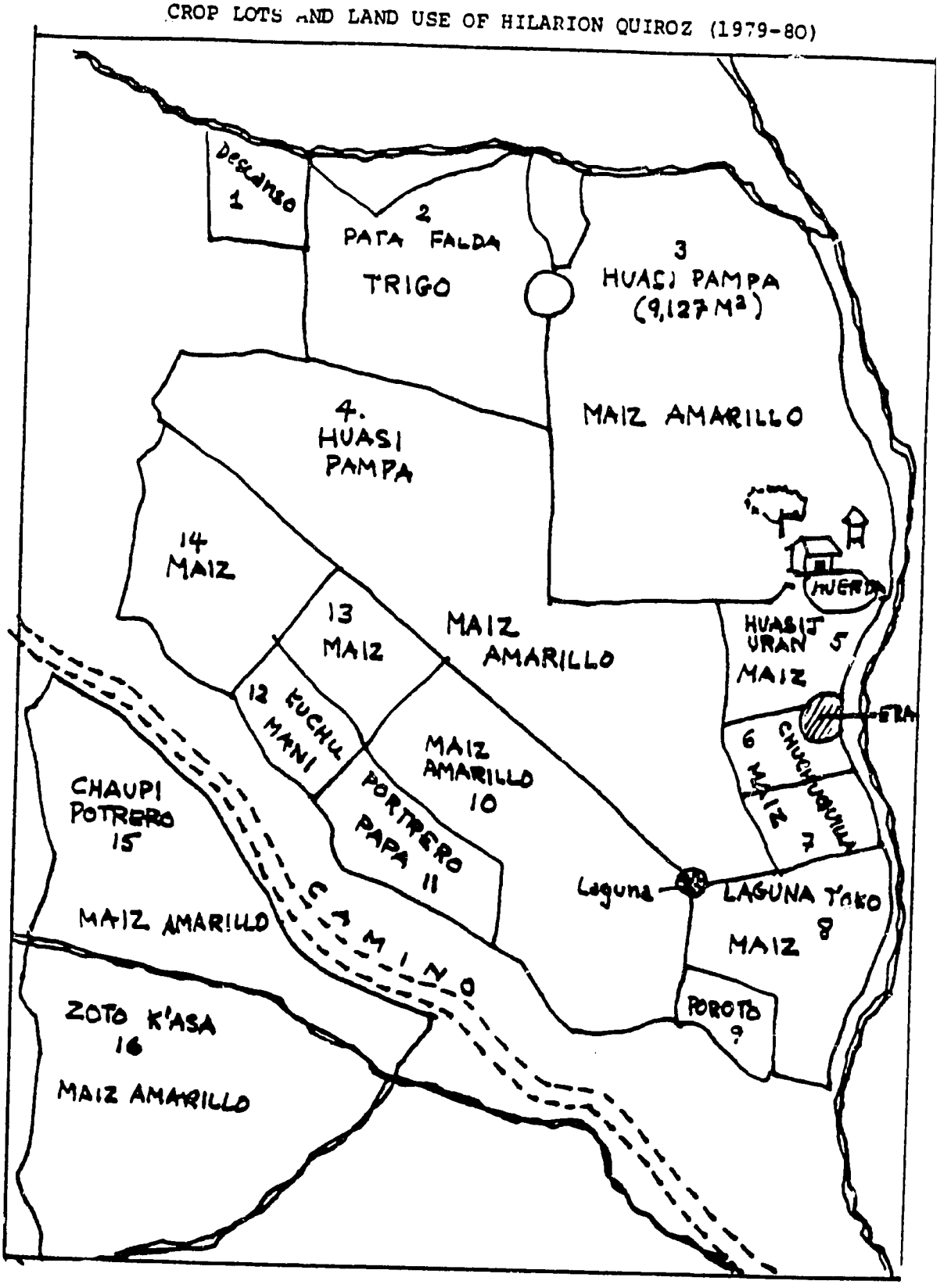
As an example of corn growing in Puca Puca, we present the case of Hilarión Quiroz. In 1979, the Quiroz household cultivated all but one of its 16 crop lots. Of these, 11 lots were planted to corn, one to wheat, one to peanuts, one to potatoes, one to beans, and one lot was left in fallow. Furthermore, the family's five largest crop lots (representing over two-thirds of its total holdings) were planted to the single variety of Maiz Amarillo. The performance of one of these lots --known as Huasi Pampa and just under one hectare in area--is described below.

AREA PLANTED AND SEED USE: The Huasi Pampa lot is located beside the Quiroz farmhouse and measures 9,127 square meters. It was planted over a four-day period, from December 27-30, 1979. Overall, Hilarión utilized four arrobas of seed (100 pounds), and on one quarter of the field he applied ten sacks (about 1,000 pounds) of manure.

LABOR AND ANIMAL USE: The field was plowed on December 3rd (24 days befor planting), a task requiring 2 days of family labor and two days of oxen. Planting was accomplished with 14 days of family labor and eight days of oxen, utilizing two yuntas for four days each. Twenty-six days after planting, Hilarión conducted a single hilling with oxen which required two days to complete. His family then contributed 7.5 days of labor to weeding. The harvest was accomplished with 14.5 jornales (workdays) of family labor spread over the five-day period of May 24-29, 1980.

PRODUCTION AND INCOME: The Huasi Pampa planting yielded 18 cargas (2,250 pounds) of unshelled corn having an estimated value of 7,200 pesos or US$288. Excluding the cost of family labor, the total production expenses of the crop came to 1,170 pesos or US$47. This left a net income of 6,030 (US$241.20), which amounts to 147 pesos (US$5.88) for each day of family labor invested (41 days in all).

CROP LOTS AND LAND USE OF HILARION QUIROZ (1979-80)



LAND PREPARATION TASKS

Since land preparation and the planting of corn must await the arrival of the rainy season, the date barbechos (plowings) begin can be highly variable. In some instances, farmers may begin their plowing as early as September to take advantage of an early rain, then wait until late December to plant; others may conduct land preparation immediately before they plant, using the moisture of a single rain to plow and plant within a 2-3 day period. In addition to rainfall, plowing and planting dates for corn will depend on other factors including: (1) the area to be cultivated, (2) the urgency of farming tasks involving other crops planted before corn, and (3) the availability of oxen teams. In regard to oxen teams, the centerpiece of the labor exchange system in Puca Puca centers on the objective of ganando yuntas (earning oxen days) by family labor contributions to other farmers. The household that can accumulate half a dozen or more of these oxen "credits" is in a much better position to control its plowing and planting schedule, or to take quick advantage of agricultural opportunities made available by an unexpected rainfall.

In any event, it is usually necessary to wait 2-3 days following a rain before initiating land tillaging. At least two plowings--the levantada (lifting) and the volteada (turning)--will be completed before planting. Heavy and grassy soils will require additional tillages. If necessary, the first plowing will be preceeded by a task known as the desbrozada (rubbish removal) or ch'illkipiada in Quechua. It consists of removing branches, rocks, large weeds, crop residues, and other obstacles so that the ox team will be able to maneuver freely and safely.

Although corn is a crop which growers in Puca Puca normally do not fertilize, some farmers choose to improve soil quality in certain fields (or sections of fields) with applications of compost or manure. These materials are sometimes applied during land preparation instead of planting. This is done by spreading it on the field surface before plowings begin, then burying and working it into the soil during the initial and subsequent tillages.

It is worth passing notice that male children in Puca Puca usually learn to manage a yunta and wooden plow by the time they are seven years old. They gain much of their training during land preparations. Prior to planting it makes little difference if furrows cut by the wooden plow are not exactly straight or properly contoured. At this time there are no other participants in the task who might be inconvenienced while

a young plowman gains experience with the cumbersome wooden plow and a team of powerful draft animals. Not only must the plowman be trained but young oxen as well. These animals must be taught to bear the yoke, to obey signals, to pull in unison, to walk in straight lines, and to turn around in tight circles. The training of young oxen is an activity known as amance de novillos (see CATTLE, Chapter IV).

PLANTING

SEED SELECTION: Farmers in Puca Puca grow their own seed. They use a number of different varieties including amarillo, kulli, blanco, pacheco, wilkaparu, and chuchuquilla. Amarillo is the principal variety for commercial sale, wilkaparu is the preferred variety for making corn beer, while the others are consumed in boiled form, or toasted, or as cornmeal. The largest ears of each variety are destined for seed. These ears are identified during the harvest and picked without removing the husks. They are then stored all year in a well-ventilated, outdoor storage silo known as a troje (see STORAGE, below).

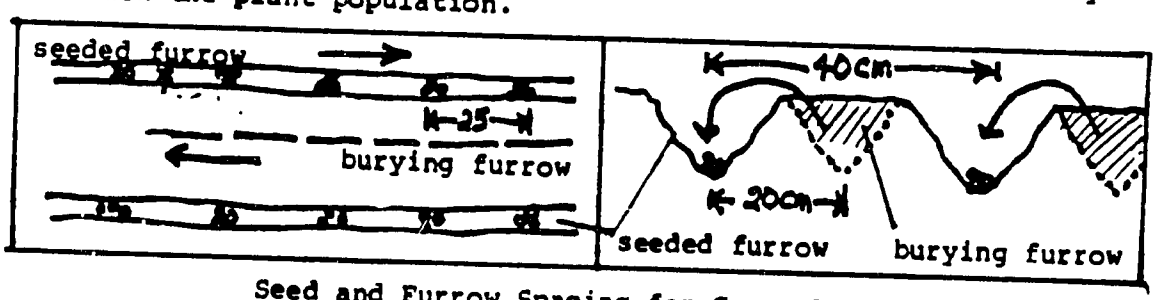
A few days (or even hours) before planting, the housewife goes to the troje and removes a quantity of ears of seed corn. These are husked on the spot; the husks are left on the ground beside the troje to be eaten by pigs or other livestock. Each ear is inspected carefully before it is shelled. The ideal ear of seed corn should have at least eight even rows of kernals which extend most of its length. It should be entirely free of rot and undamaged by moths and weevils. The individual kernals should be large, plump, and shiny. Ears with these characteristics will be shelled by hand, using the thumb to push the kernals off the cob. Only those kernals located in the middle two-thirds of the ear will be used for seed; the rest will be saved for family or animal consumption. A housewife can shell about one arroba of seed (25 pounds) in an hour --enough to plant one-fourth of a hectare of land.

Preparing Seed for Planting

THE PLANTING TASK: The first activity of planting is a ritual burnt offering to the Earth Mother--the now-familiar khohada. This is followed by the smoking of a cigarette and the first pego (shot) of coca chewing.

Planting is usually conducted with either one or two yuntas. If done with one yunta, the plowman cuts each furrow, waits until it has been seeded, and then makes a return trip to bury the seed. In two-yunta planting, a second plowteam follows behind the planter to bury the seed. Obviously, the second method is twice as fast and the planter must work twice as hard. In terms of wage or exchange labor equivalents, a planter working with one yunta only earns a single jornal (workday), which is equivalent to a half-day of yunta (if one is earning oxen credits). Planting with two yuntas is considered a double jornal or a full day of yunta.

The furrows for forn are cut to a depth of 15-20 centimeters, with a width of about 40 centimeters from one furrow to the next. The return or following furrow to bury the seed is conducted at a width of only 20 centimeters from the seeded furrow. The planter is usually a woman, but children and men also plant in Puca Puca. The seed is carried in a waist apron which leaves both hands free to remove and scatter the seed. The normal seeding pattern is to drop 2-3 kernals at intervals of 20-30 centimeters. However, in more fertile sections of the field, or in years when abundant rainfall is expected, it is not uncommon for farmers to plant as many as five seeds at a time. The five-seed strategy is also used in areas where a serious bird threat exists. Birds love to eat the young corn sprouts, and their predations will automatically thin back the plant population.



Seed and Furrow Spacing for Corn Planting

It is customary to mix squash, gourd, and watermelon seed with the corn inside the seedbag. This results in a thin, random sowing of these associated crops throughout the corn field. Subdivisions or sections of the field--known as cuarteles--are often separated one from another with a row of peas, quinua, or beans. If different varieties of corn are planted, they will occupy separate cuarteles.

Normally, no fertilizer is applied at planting time. In the case of one-yunta planting, the planting party will consist of at most three individuals: the plowman, the planter, and sometimes a "guide" (usually a child) who leads the oxen.

While corn must be planted within a few days after a rain, farmers in Puca Puca never plant at the time of the new moon or wañu. It is believed that corn planted at that time will produce shrunken ears.

Rainfall received a few days before planting is actually a prerequisite for furrowing and provides enough moisture for corn seed to sprout within five days. However, rain which falls on the day the seed was planted or on any of the days before sprouting is considered a minor disaster. This causes the soil to become muddy; it then hardens into a stiff crust which retards or prevents sprouting of the plants. Rain just after planting also serves to chill the soil, and this results in uneven sprouting. An uneven sprouting further increases the risk of the crop being destroyed by birds. When a recently-planted field receives an untimely soaking with rain, farmers in Puca Puca attempt to alleviate the problem of soil hardening in either of two ways. The first is to enter the field on horseback and rake its entire surface with a branch from the algarrobo tree; this must be done before the soil surface has hardened. The second method is to drive a flock of sheep or goats back and forth across the surface of the field.

Birds always remain a serious threat to a new planting of corn. They begin to eat the sprouts as soon as they break from the soil. On sunny days bird predations are limited to the cooler early morning and late afternoon hours, but on a cloudy day the bird threat will be continuous. The danger lasts for about a week after the plants have sprouted. It requires that a child or other member of the farm family walk about the newly-sprouted field and scare off all birds during the critical hours. If rain should fall after the crop has sprouted, this is indeed a blessing for two reasons. The moisture first causes a burst of growth by the plants. But it also turns the soil surface muddy, and this mud--because it gets stuck in the beaks of birds attempting to eat the sprouts--discourages their predations.

Whether because of birds, or premature rainfall, or even poor quality seed that fails to germinate, it is still necessary--during most years--to conduct a replanting of parts of the field. This task is known as the tarpupado. However, it is seldom completed independently but rather combined with another task such as weeding or hilling. But as before, when these replanted sections begin to sprout, it once again becomes necessary to maintain a one-week vigil against the birds.

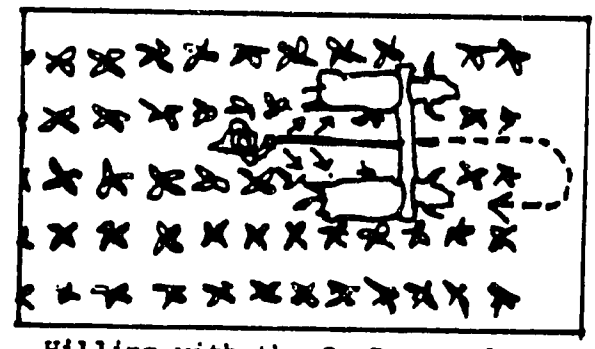
CULTIVATION TASKS

WEEDING: Unfortunately, rainfall makes weeds grow as well as corn, and sometimes the weeds are faster. Since most families in Puca Puca grow at least two hectares of corn, and their plantings of this crop may be spread over a period of a month or more, it often happens that they must begin weeding tasks even before planting has been completed. During the entire production period, corn is usually weeded at least twice. The first weeding normally occurs about three weeks after planting. It consists of removing weeds and grasses by hand, or with the hoe. Once removed, the plants are left on top of the soil surface to dry in the sun. If fodder for livestock is scarce, weeds and grasses may be washed and served to animals; otherwise the residues will be buried during the forthcoming hilling so as to decompose and fertilize the soil.

The second weeding usually occurs about the time the corn crop is beginning to tassel. At this stage the weeds and grasses are tougher and the soil too dry to permit their removal by hand pulling or hoeing. As a result, the late weeding is almost always conducted by cutting the plants with a sickle. In Puca Puca, weeding tasks--early and late--are done by all members of the family except infants.

HILLING: The corn crop is normally hilled once. This aporque is completed about 3-4 weeks after the first weeding, or about 45-50 days after planting. Known as aysana (raising), the task is conducted with the yunta. The plow cuts a furrow half-way between each standing row of corn. A clump of weeds attached horizontally to the plowshare causes the dirt to separate in two directions, pilling up against the stalk bases of two separate rows of corn simultaneously. As illustrated below, it takes two passes by the yunta to leave any given row hilled on both sides, but on each pass two rows are half-hilled. It is also noteworthy that the spacing from one row to another (40 centimeters) corresponds to the dimensions of the plow-yoke, allowing each draft animal to walk in a between-row space.

Even so, plants do get trampled. For this reason the aporque is usually conducted between two people: the plowman and a companion (usually a woman or child) who is in charge of straightening and packing dirt around any plants which may have been stepped on by the oxen.



Hilling with the Ox-Drawn Plow

Hilling with the yunta is the preferred method in Puca Puca. However, in the case of small fields or when families without oxen can not obtain them when needed, hilling by hand is also done. Hand-hilling is known as hacheado. It is conducted with the hoe or chujchuka. Because it requires many hours of stoop labor, it is one of the most physically demanding tasks known to the rural household. Perhaps for this reason farmers in Puca Puca are insistant that hilling with yunta is not only faster but absolutely better. They say that when the oxen leave their breath (samaykun) on the soil, plants produce better. Be this as it may, the aporque does benefit plants in at least three ways. First, by loosening the soil it promotes root growth. Second, the loosened soil is now better able to adsorb any rainfall that becomes available. And finally, the hilled corn plant--which is becoming increasingly top heavy as it approaches harvest--is better able to resist uprooting due to heavy rain or wind.

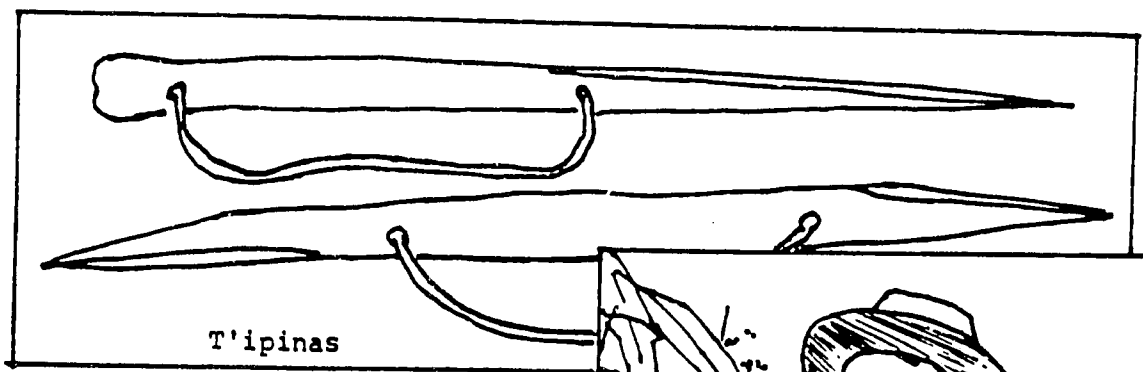
HARVEST

If planted in late December, the corn crop should be ready for harvesting in early May or about 150 days after planting. By this time the stalks will have yellowed completely and the ears will be leaning away from the stalks. While these characteristics signal the start of the principal harvest, it is important to mention that limited harvesting by farm families often begins much earlier. In fact, a short time after the corn has tasseled households will begin to pick the tender ears to meet daily consumption requirements. The months of March and April witness the appearance of humintas (corncakes), aripas (soft tortillas), and other delicacies in the family diet--all made from tender corn.

Like planting, the major corn harvest begins with a khohada to the Earth Mother followed by the smoking of cigarettes, the chewing of coca, and possibly libations of an alcoholic beverage. Some families select a limited quantity of the very largest ears they can find and assign each ear a given value--say two cargas. These ears represent what the farmer hopes his field will yield in harvest, and he asks the Pachamama to honor his prediction while burning these choice ears as part of his offering.

Each harvester is equipped with a large sack. This is rigged with a rope so as to hang from the shoulder (and extending to the ground) with the mouth open to receive the ears. In one of his hands the harvester also carries a wooden tool pointed at one or both ends; this is known as the t'ipina. It is used to puncture the husk of the ears, expose the grain, and then allow the naked ear to be twisted off the plant stalk while leaving the husk attached. The harvesting of ears is called t'ipida

(husking). But not all ears are husked. For all plants with two ears, the smaller one will be husked while the larger one will be simply twisted off the stalk and placed in the sack with its husk intact. In one-ear plants, the largest ears (beyond a specified size) will also be saved with their husk.

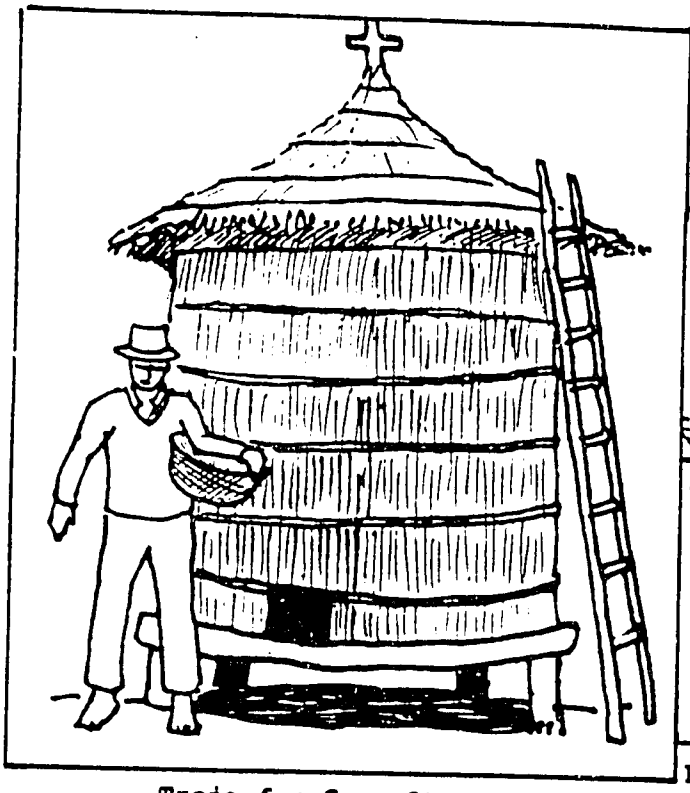


T'ipinas

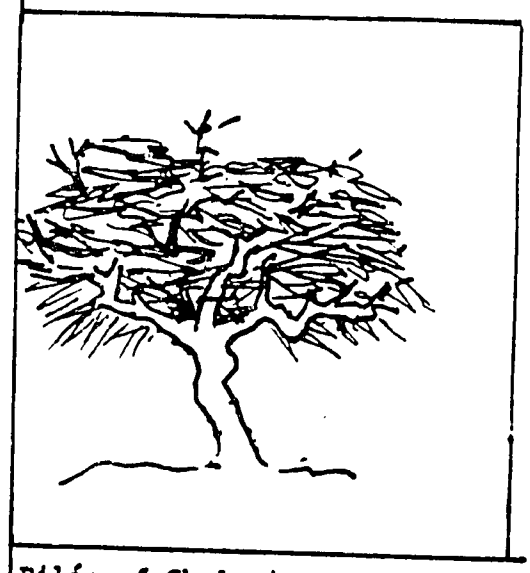
When the harvester as completely filled his sack, he carries it to a phina or storage pile located at the most convenient place in the field. An adult harvester can normally fill 8-10 shoulder sacks, which is equivalent to 4-5 cargas of 125 pounds each. A separate phina will be established for each variety of corn harvested. When the phina has been completed, the corn will be left on this pile several days to dry further before being transported to the farmhouse. While the corn is awaiting transport, the top of the pile is decorated with a wooden cross to ward off evil spirits, and at the bottom of each phina a heavy stone is placed which symbolizes an impediment to keep the corn from escaping.

Harvesting Corn (T'ipida)

The harvest is then transported back to the farmhouse. Ears with their husks still attached are stored in the troje. This is a cylindrical silo built of sticks and straw. It rests on four or more low posts which keep it about 40 centimeters off the ground--and has a removable cone-shaped roof. A small opening (less than a foot square) located at the floor of the silo allows produce to be removed. The average troje measures about three meters high with a diameter of roughly two meters. To load it therefore requires the use of a ladder. In such a



Troje for Corn Storage



Pilón of Chala in Tree Storage

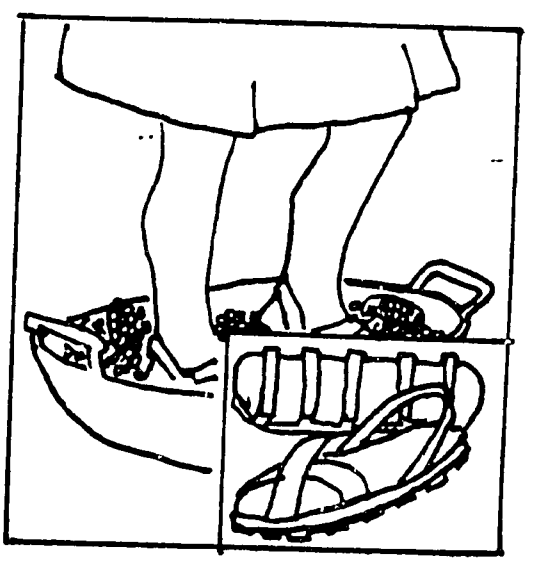
structure, unhusked corn can easily be stored for a year or more. Of course, storage time depends on family needs. Some families--after they have exhausted their supply of unhusked corn--will begin to empty their troje as early as August, others in November and December. Households with larger holdings may keep as many as four troje, for example 1-2 for commercial sale, one for seed, and one for family consumption.

When corn is harvested, the dry corn stalks and husks are left standing in the field. Then the household will wait until a day with fog (fairly rare) or the early morning hours of a moon-lit night, when the crop residues are damp with dew. Family laborers rise at 3 or 4:00 A.M. Armed with sickles, they go to the field and cut down the chala or corn stalks. These are left in gavillas (rows). The task must proceed rapidly because by sunrise the chala--while still damp--must be transported and loaded into its storage locations. In Puca Puca, corn residues are stored in algarrobo (carob) trees in piles known as pilónes. Some storage trees have been used for generations. While saplings, their branches were loaded with gradually increasing storage piles, which forced their branches to grow laterally rather than vertically to form a basket-like canopy. The pilónes are located at strategic places about the farm property--beside the farmhouse and along the boundaries of the largest fields. Their contents are reserved mostly for the consumption of oxen during

the land preparation and planting season. Only a portion of the total corn residues are stored in pilónes; the remainder is left standing in the fields. Then during the dry summer months, cattle, sheep, and goats eat this chala on site. By the time land preparations begin once more, the fields appear clean of residues.

Corn surpluses will be sold for cash or bartered. If bartered, the corn will be sold husked but with the cobs attached, and the exchange for other produce (like potatoes) will be made on the basis of units of equal weight--for example, one quintal (100 pounds) of unshelled corn for one quintal of potatoes. When corn is exchanged for processed or manufactured products, different barter ratios apply; these change constantly in accordance with the "conscience" of the barter participants.

When sold for cash, corn must first be shelled. This can be done by hand when small quantities (say, a few arrobas) are to be sold. But for large quantities, it is customary to shell the corn by stamping and spinning the ears using a special pair of rubber sandals (made from discarded automobile or truck tires) with a thick ridged sole. The ears are placed in a pile on a sheepskin or in a large frying dish called a paila. By stepping back and forth on top of the pile, the sheller causes the ears to grind against each other. The resulting friction causes the kernals to separate from the cobs and collect at the base of the pile or dish.



Shelling Corn

Commercial sales of corn are most commonly conducted at the sunday market in Aiquile. Sometimes buyers with trucks come to Puca Puca to buy the corn at the farm gate. Large transactions are usually measured in units known as tiradas, equivalent to nine arrobas (225 pounds). If not sold on-farm, the corn is loaded onto burros and transported into Aiquile by the grower. Men and women do the selling. Prices drop during the months immediately following the corn harvest (May to August). They reach their peak in November and December. Much shelling and commercial sale of corn occurs just before All Saints Day (November 1st) and Christmas.

CORN IN HUAYCULI AND MELGA

In Huayculi, corn is grown strictly as a subsistence crop. Plantings are quite small--seldom exceeding a quarter-hectare--and usually planted fairly close to the farmhouse. Indeed, corn is called huasi punku sarita in Quechua, which means that it is grown at the home doorstep.

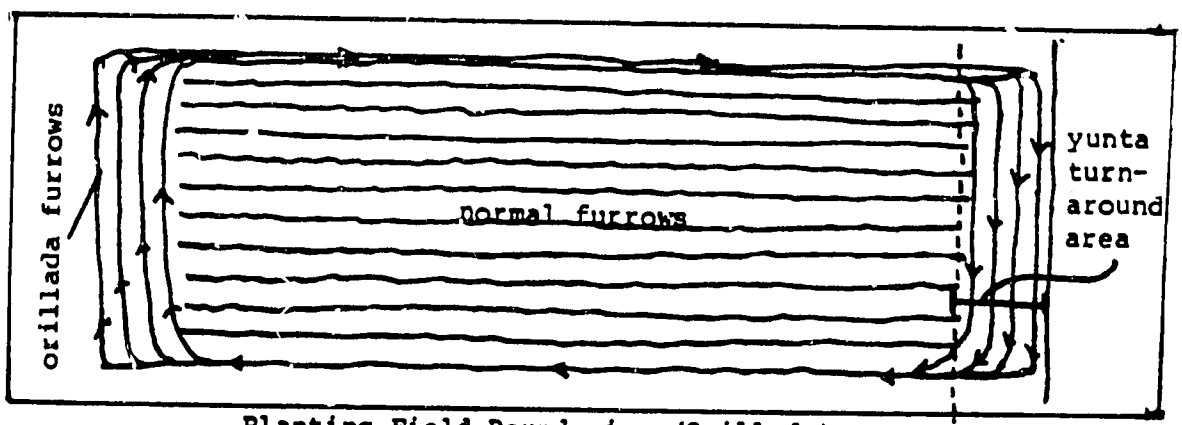
Even though irrigation resources exist, farmers in Melga prefer to grow corn as a rainfed crop. At most, irrigation water will only be used to soak the field in preparation for plowing or planting. Because of the higher altitude, corn may take as many as nine months before it is harvested in Melga. For the same reason, ear production is far from optimum. In fact, in the highest plots, this crop may be grown mostly for its chala (stalks), which makes an excellent fodder for livestock--particularly oxen. Accordingly, corn in Melga is also grown in very small plots, and almost exclusively as a subsistence crop.

LAND PREPARATION

The land preparation tasks for corn grown in Huayculí and Melga are generally more intensive than in Puca Puca. In Huayculí, the field may be first plowed with a rented tractor, then given three or more tillages with a yunta. In Melga, the use of tractors are limited to the flatter and somewhat larger fields that are planted jointly in compañia (harvest share arrangement) with the owner of the hacienda. When yuntas are used the number of rejas (tillages) usually equals or exceeds that in Huayculí. Farmers in Huayculí explain that their soil is especially arid (as well as very heavy clay), and numerous tillages are necessary to enhance its moisture retention. Melgueños advance a similar arguement, reasoning that because corn is grown under rainfed conditions it requires more land preparation than their other, irrigated crops. In both communities, fields destined for corn are leveled with the oxen-drawn umbral or rodillo after tillaging operations have been concluded. This helps to destroy any remaining clods and also serves to maintain soil moisture for the planting that follows.

PLANTING

Depending on rainfall and the completion of land preparation tasks, corn in Huayculí will be planted between mid-November and mid-January. Since the growing season is considerably longer in Melga, corn may be planted there as early as September. The preferred seed variety in both communities is uchuquilla. The furrowing and planting procedure is similar to that of Puca Puca, using a single yunta and a seed planter and usually without any application of fertilizer. What is different is that each hill of seeds is spaced a little further apart--about 10 centimeters--than the 20-30 centimeter spacing in Puca Puca. Another practice widely practiced in Huayculí and Melga is that of the orillada or bordering. This task consists of planting the field boundaries in those turn-around areas for the yunta where furrows could not be completed and planted. Instead of extending the furrows by hand (which is the practice for potatoes), the plowman and seeder simply cut and plant several continuous furrows that trace the circumference of the field. Finally, when all furrows have been seeded and filled, farmers in Melga prefer to conduct a final land leveling with the rodillo.



Planting Field Boundaries (Orillada)

CULTIVATION TASKS

In Huayculí and Melga, corn crops may sprout as quickly as 7-8 days after planting or delay as long as 2-3 weeks, depending on soil moisture conditions. As in Puca Puca, bird-watching is particularly important for a week or two after the plants have sprouted, and when bird predations are especially severe it will be necessary to conduct the tarpuja or replanting. The task of bird-watching is normally assigned to children--who use slingshots and rocks to scare the birds; but when the children must attend school, many families seek to defend their corn with scarecrows or strings

stretched between poles and covered with little paper flags which move in the wind. Weeding tasks are seldom conducted, first because weed growth is not a major problem, and secondly because minor amounts of weeds and grasses help to maintain soil moisture. The major cultivation task, then, is the aporque or hilling. This is conducted with the hoe when plants are about 25-30 centimeters high. The dirt for hilling the stalks is partly taken from shallow holes dug at half-meter intervals along the furrows to either side of the plant rows. These holes also permit the puddling of water in the event of a rain, thereby helping to maintain soil moisture. In Melga, what little weed growth as may occur is gradually harvested as fodder for livestock. In a year of scarce weed growth, some households will plant barley among their corn crop during the aporque, then cut it green as cebada en berza just before the corn harvest.

HARVESTING

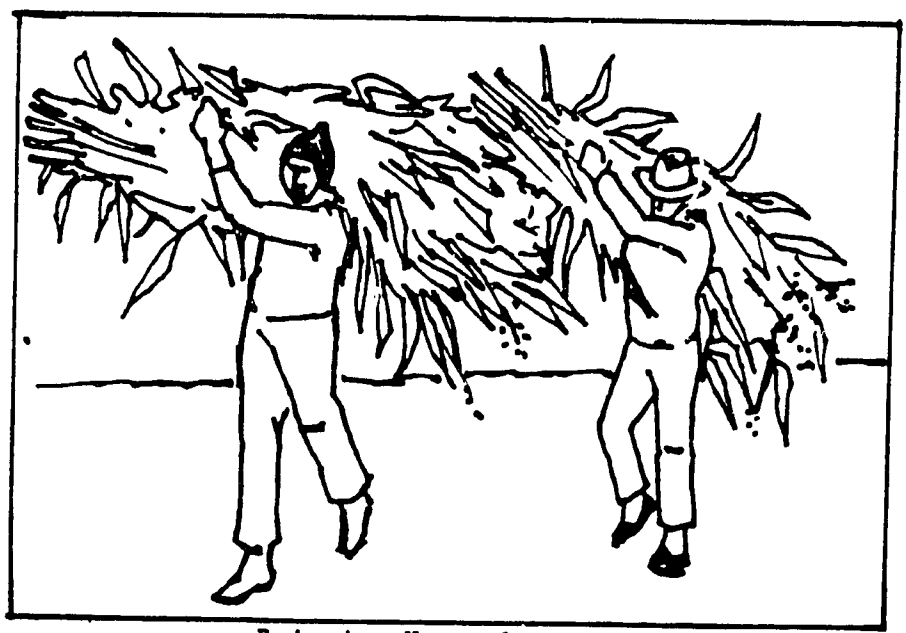
As in Puca Puca, the farm household will begin to harvest a few ears of corn on a daily basis once the corn is mature but still tender. Such early harvesting will continue for a couple weeks. It begins when farmers see birds returning to eat the ears. A grower from Melga had this to say: "The tarajchis know better than we do when the ears are ready for eating."

The crop will then be left to dry for another month or so. Sometime around 120-140 days after planting, when the stalks appear completely dry, the corn crop will be cut down and placed in upright stacks known as kalchas. The stalks--with ears still attached--are first cut near their bases and laid on the ground in neat rows. At the end of the day these stalks are gathered one armload at a time to make the stacks. A single armload is stood vertically to make a post; four or five additional armloads are then placed at a slant to surround the post, their stalk tips interlocking at the top to give the kalcha stability. A normal corn plot in Huayculí or Melga will not exceed ten kalchas. Provided there is no rain, the corn will be left for a month or more to dry completely. But if the crop is surprised by an unexpected rain, the ears must be husked and dried immediately to be kept from rotting.

Once field drying is completed, the husking task or deshoje begins. The preferred tool for stipping the husk is a thick needle for sewing cargo sacks, known as the yarwi. Each laborer is normally assigned a single kalcha of corn to husk. At his or her preference, the task can be conducted in a sitting or standing position. The ears are stripped from their husks without separating the husks from their stalks. Following the deshoje, the ears are transported to the farmhouse and usually left to sun-dry further on the roof before being placed in storage. The chala or stalk residues are gathered and brought home, where they are placed in

horizontal storage silos--called karmas--and gradually rationed for the consumption of draft animals. Unlike Puca Puca, tree storage of chala is not practiced in Huayculí and Melga. Furthermore, ear production is insufficient to justify the construction of trojes for open-air grain storage.

Although corn is grown strictly for subsistence in Huayculí and Melga, it is still sometimes necessary for the farm household to contract hired laborers to assist with the task of deshoje. The normal compensation is to make a payment-in-kind. For a single day's labor, a worker can expect to receive 1.5 arrobas (150 pounds) of maiz en marlo (unshelled corn). In Melga, it is also common practice for families to grow corn on a joint basis--known as compañia--with other producers, particularly with the ex-hacienda owner. In such cases one party provides the land and any necessary inputs while the other provides the labor. The harvest is divided in equal shares of ears (by weight) and chala (by volume, measured in armloads or kalchas). Occasionally as many as six Melga families will participate in a compañia arrangement covering a large field of corn.



Bringing Home the Chala

WHEAT IN HUAYCULI

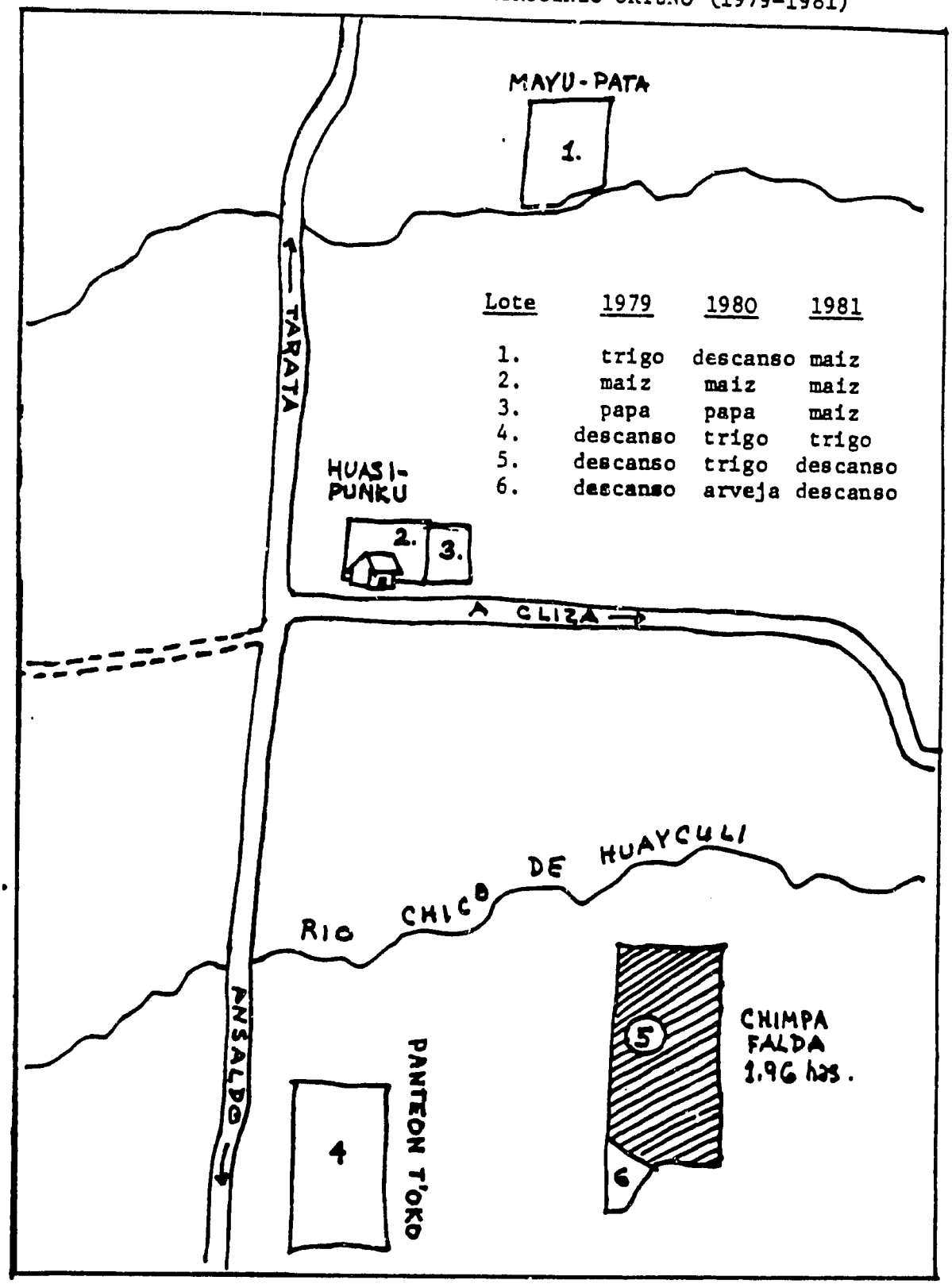
A SUMMARY OF CROP PERFORMANCE
(PATROCINIO ORTUÑO: 1979-1980)

The dominant productive activity of Huayculí is not farming but pottery-making. Since the majority of available family labor is invested in artisan activities, Huayculeños make considerable use of rented tractor services for land preparation, planting, and even harvest tasks of their crops. For the same reason they use larger amounts of hired labor as well. Because of the aridity of its soils, wheat is the only crop grown on a commercial scale in Huayculí. During a normal year, the average family will cultivate about 2.5 hectares, of which about four-fifths will be planted to wheat. As an example of wheat cultivation, we present the case of Patrocinio Ortuño during the crop year 1979-1980.

AREA PLANTED AND SEED USE: As shown on the accompanying farm map, the Ortuño household owns six crop lots, three small and three large. The smallest fields--two of them located next to the farmhouse and cultivated intensively--are devoted to subsistence crops such as corn, potatoes, and peas. The three large fields are used on a rotational basis and mostly planted to wheat. On December 21, 1979, Patrocinio plowed and planted with wheat his largest crop lot known as Chimpa Falda, with an area of just under two hectares. He employed 21 arrobas (525 pounds) of home-grown seed of the variety Gabo. No fertilizer of any kind was applied at planting.

LABOR AND MACHINERY USE, BY STAGES: No animal traction was used with this crop. Neither was there any barbecho (land preparation). The field was plowed just once by a rented tractor, immediately planted using the broadcast method, and the seed buried with another pass by the tractor. Ten hours of tractor and two labor days (one by Patrocinio) were employed at planting. No further task was conducted until harvest. After 158 days the wheat was cut and stacked, a task lasting three days and requiring 28 days of labor (all hired); five more days of hired labor were needed to transport the cut wheat to the threshing floor. Threshing did not begin for another 85 days, for which a tractor and three hired laborers were employed. The winnowing (venteo) and cleaning (paleado) of the grain required nine more days of labor, five of them by Patrocinio. In total, 47 jornales of labor were used (41 hired), and all but two of them occurred during the harvest period. Thirteen hours of tractor were used, ten for planting and three for threshing.

CROP LOTS AND LAND USE OF PATROCINIO ORTUÑO (1979-1981)



Lote	1979	1980	1981
1.	trigo	descanso	maiz
2.	maiz	maiz	maiz
3.	papa	papa	maiz
4.	descanso	trigo	trigo
5.	descanso	trigo	descanso
6.	descanso	arveja	descanso

PRODUCTION AND INCOME: The plot at Chimpa Falda produced only 77 arrobas (1,925 pounds) of threshed, dry grain. This represents a yield of 3.7 times the amount of seed used. The harvested grain was valued at 4,400 pesos (US$176). Excluding the value of family labor, total production expenses for the wheat crop amounted to 4,240 (US$170), resulting in a net income of only 160 pesos. For each of his six days of family labor, Patrocinio earned a mere 27 pesos (US$1.08). This result was considerably below the wage rate for hired labor, which was 50 pesos per day in 1980. In other words, Patrocinio's wheat crop was somewhat less than a break-even proposition. To recover enough seed for the following year's crop he was obliged to draw upon family cash income from pottery production.

LAND PREPARATION TASKS

Patrocinio chose not to conduct a barbecho. This is a common practice in Huayculí. It is particularly common among households who have difficulty renting a tractor on a timely basis during the traditional land tillaging seasons (March-April or November-December). Other reasons for non-tillage include (1) repeat use of a field that was extensively plowed the previous year, and (2) expectations of a poor (drought) year, causing the farmer to economize on expensive investments in machinery services.

However, when barbecho is conducted the farmer will follow one of two alternatives. The first is the wata barbecho or "yearly tillaging". It is completed with the last rains of March and April. When the land has lain in fallow several years it will be covered with scrub brush. Prior to plowing the household will cut down this brush for use as fuel in their ceramic oven. The second tillaging alternative is the barbecho de lluvias or "rain tillage", which is conducted following the first of the rainy season in November and December.

In Huayculí, land preparation tasks are almost always done by outsiders who rent either tractor or oxen services. The large majority prefer to use a tractor, which can be rented for US$6-10 per hour. It is common for several neighbors to join together in arranging a plowing contract and bringing a tractor to the community. The tractor may remain in the community for several days, going from one farmer's field to another. However, a few households use oxen, which can be rented for US$4-6 per day. Tillaging by oxen requires two or three successive plowings--called rejas ("bladings") or rayadas ("scratches")--each conducted in a direction perpendicular to the next.

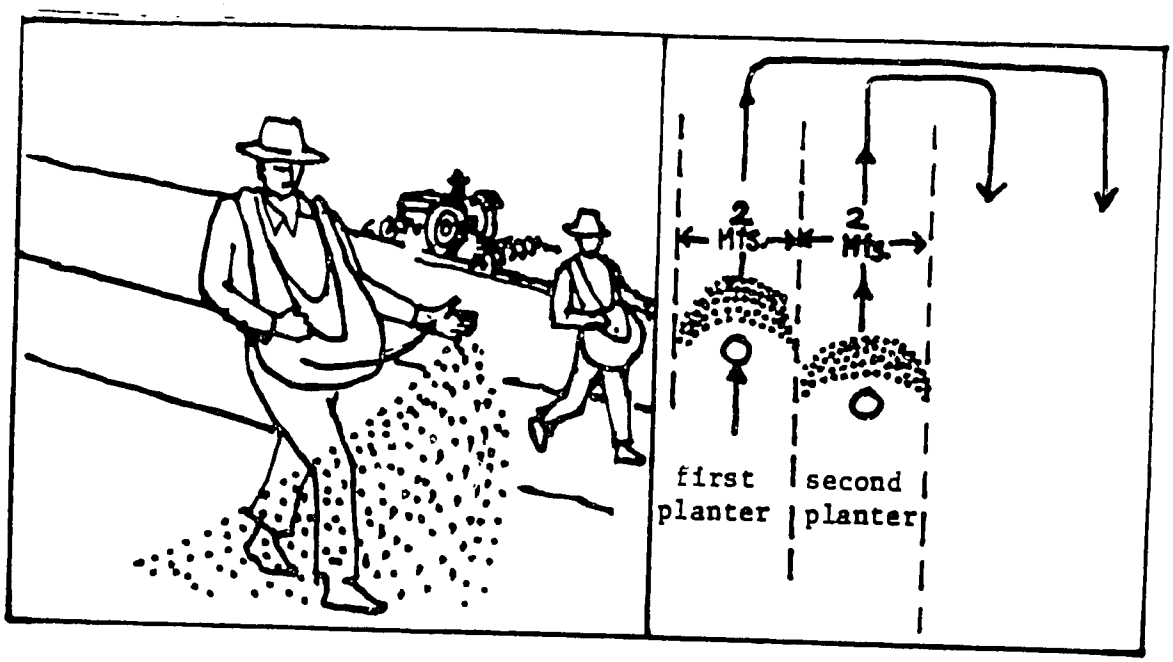
PLANTING

Planting dates for wheat are highly variable because they depend not only on the arrival of the rainy season but also on the availability of hired tractor or oxen services. The principal wheat varieties planted in Huayculí are Gabo and Méjico. Gabo is the most popular because it is a seed which farmers describe as más chica, meaning in this case a seed that is faster-maturing not smaller in size. Seldom is wheat seed purchased from outside the community. Home-grown seed from the previous harvest is stored and used without any treatment of any kind.

Wheat planting in Huayculí is done only by men. Women will participate in planting activities only to assist in the loading of seed bags or to prepare meals and beverages for laborers. If the planting is done with a tractor, two planters are required whereas a planting with oxen requires only one seeder. In this community it is not customary to prepare a burnt offering to the Earth Mother, although workers will chew coca, smoke cigarettes, and drink chicha.

The task begins with the tractor plowing several round trips across the field. A disc plow attachment is used allowing a tillaging width of 2.25 meters. Between any two contiguous strips there will be a small overlap so that their combined width (for a round trip) will be about four meters. Wheat is planted by broadcast, with each planter sowing a width that is two meters in width. One handful of seed is thrown with each step taken by the planter. At each field boundary, the planters place a stick to guide their advance and make sure they maintain a constant sowing width. These sticks are moved each time a strip has been planted. The broadcasting of seed is known as voleo.

The field is divided into sections known as melgas. Each melga consists of one or more double (four-meter-wide) planting strips. After several melgas have been planted, the tractor returns to cover over the seed with a final tillage. Once the entire field has been completely planted, the tractor will plow the field boundary throughout its circumference. This single strip will then be planted and buried, a task known as orillado (edging).



CULTIVATION TASKS

In Huayculí, wheat crops are seldom weeded except during years when there is enough rainfall to create a weed problem. If weeding does occur, the task is normally reserved for women and children, with weeds and grasses removed by hand.

Nor is wheat fumigated in Huayculí. However, many households experience problems with anthills in their wheat fields--particularly those of a black ant known as chchaka huari which attacks young wheat sprouts. To destroy this pest it is necessary to dig up the anthill, locate the nest, and then flood it with water or burn it with kerosine. Some farmers apply insecticides (such as DDT, Aldrín, or Lexone) in a circle about the anthill.

Another possible cultivation task can occur just after planting, when an unexpected rain within four days of seeding causes the soil surface to become muddy and dry into a stiff crust, thereby preventing or hindering sprouting. The local solution to this problem is to run flocks of sheep back and forth across the newly-planted field, or to rake the soil surface with algarrobo (carob) branches dragged by a horse or even oxen. But in most years, once the wheat crop has been planted it requires little or no further attention until it is ready to be harvested.

HARVESTING TASKS

CORTE

Most of the labor involved in wheat cultivation occurs during the harvest stage. This rather long and rather complicated process normally begins during the month of May--or about 150 days after planting--with the task of reaping or corte. By this time the grain heads are full and the stalks are yellow. It is important to conduct the task opportunely, because if the farmer waits too long he risks the loss of a significant amount of grain which will be shaken to the ground during reaping and transport. If a postponed reaping is inevitable, it is best to conduct the cutting in the early morning when dew makes the stems and panicles less brittle and dry.

The corte is conducted in a stooped position using the hand-sickle or hoz. The laborer cuts the stems one at a time, crowding them into his hand until the fist is full, then lays the clump on the ground in a row behind him. The location of the cut itself may vary from 25 to 50 centimeters above the ground, the height depending on what is the planned use for the straw after threshing. Longer-stemed straw is used for forrage and thatching of roofs, shorter stems for fuel and the making of adobe bricks.

The reaping continues until an entire field section or melga has been completed. Then the cut stems are gathered into piles in preparation for transport to the threshing floor. In preparing these piles, it is important to stack the stems so that the grain heads face in a variety of different dirrections. This not only serves to bind the pile together but also helps to keep loose grain from falling to the ground during transport. If the reaping is to continue for several days, transport will not begin until the crop has been completely cut down and gathered. This means the piled wheat will remain in the field for several days. To protect each pile from wind, it is customary to place a rock or heavy dirt clod on its top.

Reaping Wheat

For fairly small fields, wheat can be reaped by stages using family labor. But most households in Huayculí conduct the corte by contracting hired laborers. A common practice is to hire organized gangs of hired laborers who pass through the region during the harvest period. A single fixed price may be negotiated for the reaping and transport of an entire field of wheat, or work assignments may be made on an individual basis depending on task areas. The wheat is transported from the field to the threshing floor by head-carrying it, or hauling it on burros, or sometimes by renting a truck.

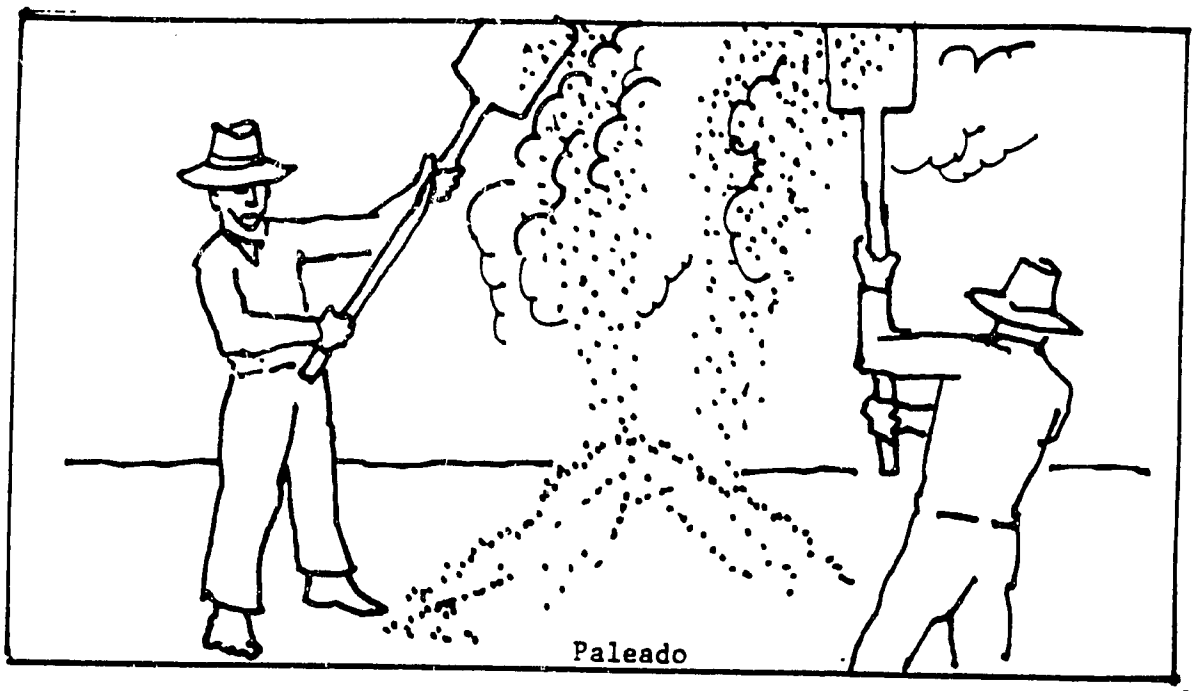
TRILLA

The wheat is left on the threshing floor until it is possible to contract for the services of a tractor. The threshing procedure consists of driving the tractor around and around the threshing floor, using its large rear wheels to crush the panicles from the stems and the grain from their heads. As the tractor circles the mountain of straw, laborers armed with wooden pitchforks continuously scoop the straw and throw it in the path of the wheels. A normal threshing with tractor requires about three hours to complete. Mid-way through this period the machine is removed from the threshing floor and the wheat pile turned over completely. The tractor then continues to roll around and through the pile as before.

Tractor threshing of wheat is customary in the case of fairly large harvests of, say, one or more hectares of land. To thresh smaller harvests it is common to beat the wheat with sticks. Sometimes brooms are used for threshing as well. However, the most common threshing method continues to be the tractor, which can always be procured--even for small wheat harvests--provided the farmer agrees to join with his neighbors in offering sufficient threshing work to make a trip by the tractor into the community worthwhile.

VENTEO

After threshing the grain must me winnowed, a task known as venteo. It requires a strong wind, and sometimes the farm household must wait weeks until a day of suitable wind occurs. This winnowing task is conducted in two separate stages. The first is to separate the large straw from the grain, the second to clean the grain of chaff and impurities. The first stage requires three laborers--two men or jorkaros who throw the straw into the wind with their pitchforks, and one woman (called the barrendera or sweeper) who sweeps any straw off the forming grain pile. In the second stage, the men exchange their pitchforks for wooden shovels. They toss the semi-clean grain into the wind, this time allowing the wind to blow away chaff and other impurities. The shovels used for this purpose have a handle about 1.5 meters long and a blade some 25 by 30 centimeters in area. The task itself is known in Spanish as paleado and in Quechua as chuyanchar.



STORAGE, SALE, AND USES

The clean grain is loaded into storage sacks using a ceramic vessel known as the viche, which is equivalent to 45 pounds when filled with wheat (see WEIGHTS AND MEASURES, Chapter II). This process is known as the tasada (appraising) and allows the rural household to measure the results of its harvest. The clean grain is stored in adobe bins (usually located beneath beds), or metal oil drums, and sometimes in cargo sacks when the family does not suffer from serious rat infestation. The wheat straw is stored in open-air sheds, in storage piles capped with a layer of dry mud, or is buried in underground storage chambers--sometimes constructed in the same field—known as boquetes.

Predominantly, the wheat grown by Huayculeños is used for home consumption. The variety Méjico is mostly used for making bread, and is also used in stews and spicy sauces. When toasted and ground into flour, this cereal is known as pito—a very popular breakfast food for the whole family which is also used as a soft meal for old people without teeth. The variety Gabo is particularly prized for making wiñapu, a substance used to accelerate the fermentation of chicha.

When sold inside Huayculí, wheat is measured by viches and half-vinches known as phata mankas. Outside the community, what little wheat is marketed is sold at sunday fairs in retail quantities as small as a pound or two (measured in tin cans of powdered milk containers).

WHEAT IN PUCA PUCA AND MELGA

Wheat is also an important crop in Puca Puca and Melga, where it is grown by about three out of every five households. But unlike Huayculí, areas planted to wheat are much smaller--averaging about two-thirds of a hectare per family in Puca Puca and one-third of a hectare in Melga; furthermore, the crop is produced without the use of tractors, and both land preparation and cultivation tasks are more intensive than in Huayculí. Seed varieties are also different. These and other differences are described below.

LAND PREPARATION

In Puca Puca, land preparation for wheat begins in January following the planting of the more important corn crop. Soil tillaging must await a series of rains. Following the first rain, the task of chilqipeada is conducted, which consists of clearing the field of weeds and scrub brush; then immediately afterward the first plowing (levantada) is completed. After another rain the second tillaging (volteada) can be finished, but some farmers like to conduct still a third tillage. In Melga, wheat is often planted in a plot previously devoted to potatoes--particularly potato crops damaged or destroyed by frost or blight as a way of making use of the heavy fertilizer investment. In such cases land preparation and planting tasks follow one upon the other. Here it is customary to conduct a single tillaging with the ox-drawn plow. At this time a woman or child, carrying a basket, will follow behind the plowteam collecting any potatoes that might have been overlooked during the harvesting of the previous crop. After one tillaging, some farmers prefer to complete a land leveling using the heavy ox-drawn rodillo (T-shaped roller implement).

PLANTING

The wheat planting season in Puca Puca is considered to last from January 6th (Reyes) to February 2nd (Candelaria). Once again, planting is dependent on a rain heavy enough to soak the field. The most popular seed variety is Mocho, a fast-maturing wheat, and Estrellano, which is slower-growing but preferred for its durability. In Melga, wheat planted in December and January is usually of the short-duration Méjico variety, but some farmers have begun to experiment with a hybrid seed developed in Bolivia known as Chinoli.

As in Huayculí, men do the wheat planting. The seed is carried in a seedbag known as the t'impina, or simply in a gourd. Women participate by replenishing the seed supply and guiding the furrowing and seeding activities by placing sticks at the field boundaries. The planting procedure begins with the ox-drawn plow cutting 4-5 furrows to complete a melga (field section) that is 2 to 2.5 meters in width. As soon as one melga is ready, it is planted while the plowteam prepares the next melga. The seed is planted by broadcast, and the seeding rate amounts to about 150 pounds of seed per half-hectare. After 3-6 melgas have been planted, the plowteam stops preparing new melgas and beins to cover over the seed in the planted melgas using a shallow plowing depth of 12-15 centimeters. This quick burial of the seed is necessary to keep it from being eaten by birds. After half of the field has been planted, it is customary to conduct an orillada or furrowing and planting of the border areas for that half; the borders of the other half of the field will be planted when the entire field has been completely planted. In Melga, farmers prefer to conduct a land leveling after the wheat has been planted and covered. After leveling, they also usually plow drainage ditches across the field at intervals of about five meters. As in Huayculí, no fertilizer is applied to the wheat crop during planting, nor at any other time.

CULTIVATION TASKS

In both Puca Puca and Melga there exists a serious bird threat. Therefore the first post-planting task is to protect the wheat crop from birds. There are two kinds of bird defense activities. The first, known as jarapear, consists of placing scarecrows in the field or stringing paper flags that blow in the wind. After the first sprouts appear (about a week after planting), the second defense--called phesqueada--involves the presence of children using their slings and voices to scare off birds.

Weeding of wheat is rarely neglected in Puca Puca and Melga. The task begins about 6-8 weeks after planting. In smaller fields, weeds are removed by hand or by hoe, depending on their height. In larger fields it is becoming popular to use herbicides for weed control. As in Huayculí, a final cultivation task involves the destruction of anthills.

HARVESTING TASKS

Wheat is reaped in all three communities using the hand-sickle. But unlike Huayculí, wheat crops in Puca Puca and Melga are threshed with animals. Horses are preferred for this task over burros and oxen. One worker stands at the center of the threshing floor; he holds the reins of two horses and drives them with a whip. Additionally, one or two adult workers move around the edges continuously forking wheat straw into the center of the floor so that it can be repeatedly trampled under the horses' hooves. The animals are driven around and around in one direction for about half an hour. This is called a pasada (pass). Next, the horses are turned and driven in the opposite direction. After at least one pasada in each direction, the animals are withdrawn and the entire contents of the threshing floor thoroughly turned over. Now the animals resume their trampling for two more pasadas. This process continues until the threshing is considered complete. After that, it is necessary to wait for a windy day to conduct the winnowing, a task requiring a two stage process of venteo and paleado which is completed exactly as in Huayculí.

Threshing Wheat with Horses

PEAS (ARVEJAS)

After potatoes, corn, and wheat, the most commonly-grown crop in the Valleys region are peas. This is considered a cultivo de relleno or "filler crop", planted in a little piece of land not occupied by more important crops. The average size of pea plots ranges from about one-tenth of a hectare in Puca Puca, and one-eighth of a hectare in Melga, to a quarter-hectare in Huayculí. The above estimates apply to pure stands of peas. However, peas are often grown in mixed plantings with habas (broadbeans) or avena (oats). In such associations the pea crop helps to improve soil quality (through nitrogen fixation), while the stalks of the haba or avena plants serve as guides for the pea vines.

LAND PREPARATION: Soil tillaging for peas can be quite variable. In Huayculí, for example, peas are sometimes planted in one corner of a field which has been tractor-plowed for planting wheat. In other cases, peas may be planted in the stubble of corn or wheat crops with no prior land preparation other than furrowing. In Melga, land preparation for peas is conducted in either of two seasons. For the miskha (irrigated) crop, the land is plowed between December and March; for the jatún tarpuy or annual crop, tillaging can be conducted between July and September. Melgueños prefer to conduct at least two rejas (tillages) for peas, and sometimes three. More intensive tillaging is the norm for the rainfed crop.

PLANTING: Farmers in Melga sell or consume practically all their pea crop in the green stage; thus, little is left to dry and thresh for seed, and each year the seed must be purchased from outside the community. Threshing and storage of dry peas is more common in Huayculí and Puca Puca, but for consumption rather than seed, so that these producers also purchase or barter for pea seed from other communities. However, when seed is saved, the selection process is quite simple. One must merely choose the plumpest pods, shell and dry the peas, and store them in a dry vessel. No disinfectant is needed. The seeds themselves dry so hard that (like broadbeans) rats will not eat them.

Peas are planted using the ox-drawn plow. The plowteam cuts the furrow and the planter (usually a woman) drops the seed in an almost continuous stream. The plow then turns around, cuts a parallel furrow at a width of 20-30 centimeters from the first. This second furrow buries the seed in the first, and at the same time it too is seeded. When peas are planted

in association with another crop--like habas--it is customary for a second planter to follow behind the first, utilizing a less-dense seed spacing. However, when additional laborers for planting are not available, a single planter may mix two different kinds of seed together in her seedbag, using separate hands to withdraw and space each seed type. When peas are planted with oats, they are often sowed using the broadcast method rather than plantings in individual furrows. In this case, the plowteam will prepare several melgas (field sections) at a time; these will be sowed first to oats, then to peas, and finally buried with a subsequent tillaging by the plowteam. In Melga, it is customary to level and compact the soil surface of the field after the pea crop has been planted and buried. This is done with the rodillo, and is considered a prerequisite for water control during the first subsequent irrigation.

CULTIVATION TASKS: In a year of abundant rainfall, it may be necessary to weed the pea crop. However, this task must be conducted within the first few weeks after planting before the pea vines extend their tendrils. Most farmers do not weed at all because they consider this risks damage to the delicate vines. The next cultivation task--particularly (if not exclusively) in Melga--is that of irrigation. The irrigated pea crop will greatly benefit from 2-4 irrigations conducted at two-week intervals. Ideally, the final irrigation should come at the time of flowering. Soon after flowering begins the bird threat becomes severe. Farmers consider that the young peas are like the favorite "candy" of birds. The pea crop must be covered with paper flags and rags tied to strings; in addition, a scarecrow or a child with a sling may be required to guard the field.

HARVESTING: Peas may be harvested green or as dry grain, and most growers outside of Melga prefer to harvest both ways. The harvesting of green peas can be extended over long periods of time, because the plant continues to flower. As many as three pickings over two months time is possible. When peas are picked green, the harvester has the option of stooping or squatting on the ground. A waist bag or a basket is used to collect the produce. The worker must normally hold the plant with one hand and pinch off the plump pods with the other. However, some female harvesters are so adept that they can pick peas with two hands without damaging the vines. Depending on the abundance of the crop, a single adult laborer can usually pick 1-2 arrobas (25-50 pounds) of peas in a single day. A normal yield is about 150 pounds of green peas (in pod) for every ten pounds of seed utilized. In turn, 10-12 pounds of seed are sufficient to plant one-tenth of a hectare.

What peas that are not harvested green are left to dry on the vines. These can be harvested once the vines turn yellow. Each pea plant is cut with the sickle. The plant's vines are then rolled up (wrapped between the palm and elbow of the harvester) as if it were wool yarn and left in a clump on the ground. These clumps are then gathered and transported to the era or thresh-

ing floor, preferably on a dew-filled evening or early morning to minimize loss of grain from dry pods falling to the ground. The vines can be left on the threshing floor to dry further for several weeks, even months, provided this will not interfere with the threshing of other grain crops. Small plots of peas (one-tenth of a hectare or less) can be most easily threshed by hand, using a curved pole known as the garrote, which gives its name to the task itself: garrotear. Larger quantities of vines are normally threshed with animals, but in this case burros and oxen are preferred to horses. The threshing task for peas is considered easier than for wheat because the vines and pods are so brittle and can be readily crushed. However, to thresh peas it is first necessary to toss the vine clumps in the air (using wooden pitchforks or jorkas) in order to disentangle them. The task then proceeds exactly as with other cereal crops, with a worker in the center holding the reins of the animals, another driving them around and around the floor, and still two or three more workers to pitch the vines beneath the animals' hooves. Following the completion of threshing, the grain is winnowed in two stages exactly like other grain crops.

MARKETING AND USES: Harvesting of peas for commercial sale is most prevalent in the community of Melga, where the entire crop is sold green. Here it is customary for the rural household to conduct a pea cutting at two-week intervals, with the harvesting itself coming 1-2 days before a market day. Green peas are mostly taken to the Cochabamba city market, where they are sold by arrobas to intermediaries known as rank'eras ("resellers"). Pea marketing is exclusively done by women. In Huayculí and Puca Puca, peas are grown almost entirely for family consumption. During the green-pea stage, the rural household usually only harvests what it requires for its own diet, with the balance left to dry on the vine for threshing and storage.

Green peas are used to compliment or "enflower" other meals—a concept described in Spanish as enflorar and in Quechua as thikanchar. In its dry form, peas are kept for seed. They are also toasted and ground to make a breakfast or snackfood known as pito.

OATS (AVENA)

Of the three communities from the Valleys region that participated in the Traditional Practices Project, Melga is the only one where oats are grown. The crop is produced almost exclusively for the consumption of livestock and is the single most important source of silage or dry grain for cattle, horses, and burros. Depending on the land availability of the rural household, oats are grown in both highland plots under rainfed conditions as well as in lowland plots under irrigation. The average area cultivated in oats each year amounts to about one hectare per family and often exceeds area planted to potatoes. In addition, oats are one of the community's primary barter goods; the crop is exchanged--truckload for truckload--with livestock producers wishing to trade manure. Although grown predominantly for farm consumption or barter, in times of scarcity the market price for oats--as dry grain--exceeds that of all other cereal grains. In summary, the oat crop is a critically important component of the subsistence strategies of Melgueño households.

LAND PREPARATION: Oats are grown in either of two ways: (1) to be harvested green (called avena en berza), or (2) as dry grain (avena en grano). Oats for green silage are generally planted in lowland plots under irrigation. In this case they are always planted in a k'allpa--a plot where potatoes were just harvested--and thus no land preparation of any kind is necessary. A crop of oats for dry grain is usually planted in a highland plot that has rested in fallow for several months (since the previous year's potato crop); hence, a single tillage is conducted prior to planting.

PLANTING: If a household does not have oat seed from a previous harvest, it will obtain it locally--from relatives, neighbors, or at the Sacaba market. Oats for green silage, to be grown under irrigation, may be planted almost any time of the year provided adequate irrigation water quotas are available to the grower. Oats for dry grain are generally planted in October -November, for harvesting in April or May.

Oats are planted by broadcast, and almost always by men. The planter carries a seedbag slung from his neck, or sometimes a large gourd, from which he withdraws the seed and casts it with one hand only. On each trip across the field the planter covers a strip about 1.5 meters wide. Every complete round trip (or three-meter-wide strip) of planting is known as an echada (a throwing). The seeding norm is approximately one arroba (25 pounds) of seed per one-fourth hectare. After 4-6 echadas have been completed, the ox-drawn plow conducts a superficial tillage to bury the seed. When the entire

field has been planted and the seed buried, most farmers prefer to conduct a leveling of the soil surface with the ox-drawn rodillo. By destroying dirt clods and other surface irregularities, this leveling task facilitates the future harvest by allowing plant stalks to be cut almost even with the soil surface; thus, less of the crop is wasted or left behind as stubble.

After leveling, the final planting-stage task is to cut drainage ditches to protect the field from soil erosion caused by excess rainfall (in highland plots) or excess irrigation water (in lowland plots). Known as cortes, these structures are built with the wooden plow and normally measure about 20-25 centimeters deep by 25-30 centimeters wide. To promote a wider cut, the farmer will attach a clump of stiff weeds--called picha--across the plowshoe. In humid soils, as well as on steep slopes, the ditches are plowed at intervals of 2-3 meters. On flat fields or in dry soils they are spaced 3-5 meters apart.

CULTIVATION TASKS: In the highland (rainfed) plots of oats there is usually no task required between planting and harvest. Some weeding may occur, but it will be an incidental activity completed "in passing" as household members visit the highlands to conduct more important tasks on other crops. A trip from the lowland to the highland districts of Melga requires several hours, and just to weed oats is not worth the trip. In the lowland plots oats will be weeded little by little in accordance with the fodder requirements of family livestock. Aside from weeding, the most important cultivation-stage activities involve irrigation. The k'aspeo (first irrigation) should be conducted about six weeks after planting, when the oats are about 7-9 centimeters high. The second irrigation should occur when the plants attain a height of 15 centimeters. Usually one or two additional irrigations can be conducted before the crop--at three months--begins to reach harvestable age for green silage.

HARVEST TASKS: The cutting of green oats can be stretched over a period of a month or more, in accordance with livestock consumption needs. The reaping is done with the hand-sickle. The stalks are left on the ground in windrows (gavillas), then gathered into transport loads known as karmas which are equivalent to a circumference of about 4.5 meters. If the crop is being bartered for manure supplies, the supplier brings a truckload of manure to the farmhouse, unloads it, drives up to the field where the green oats have been reaped, and takes on a full load of oats. In most such barter transactions with private suppliers, the farmer is required to pay a transport fee. However, some Melga families do business with the Bolivian Army, which has a large number of horses based in the city of Cochabamba. In this case, the Army uses its own dump trucks to bring in manure and take back green oats, and farmers do not have to pay any transportation charges.

Green oats not bartered for fertilizer are transported back to the farmhouse on burros. There the crop is chopped into smaller lengths about 10-15 centimeters long and mixed with dry straw to make a more appetizing fodder for livestock. To conduct such chopping, some families use the technique of wedging the handle of a sickle into the hole of a wooden yoke, leaving the blade upright. Clumps of oat stalks are then beaten against the sickle blade.

Oats for dry grain are reaped in April or May, when the stalks are just beginning to yellow and the grain heads are fully matured. The cut stalks are then gathered into upright stacks known as kalchas. A kalcha is constructed by first taking an armload of stalks and standing it vertically to form a post. Next, 3-4 additional armloads are placed about this post and counter-balanced so that the stack stands upright. Finally, several oat stalks are twisted together to form an improvised rope which is wrapped around the stack and tied. Secured in this manner, the kalcha will effectively resist all but the strongest of winds.

The oats will be left to dry in the kalcha for a month or two. For every arroba of seed (or quarter-hectare) planted, one can expect about five kalchas of stalks. These can be transported to the threshing floor all at once—using a rented truck--or gradually over several trips with burros. Once collected at the era (threshing site), the stalks will be threshed with horses, exactly as with wheat. The household must then await one or more days of wind to conduct the two-staged winnowing of the dry grain. For every arroba of seed used, the farmer can expect to harvest about 2.5 arrobas of clean grain. The grain will be stored in a ceramic vessel or adobe bin or metal cylinder which must have a heavy lid to provide suitable protection from rats. The trampled straw is stored with the household's fodder supplies.

BROADBEANS (HABAS)

Habas are one of the truly important staple foods of the Bolivian diet. Boiled as mote, this product is used as an accompaniment of soups as well as dry meals, and in toasted form it is one of the most popular snackfoods in the country. Habas, like potatoes, require moist growing conditions. For this reason its production is quite generalized throughout Melga, which benefits from reliable irrigation facilities, and all participating households grow at least one crop of habas each year. The area planted to this crop averages one-fourth of a hectare per family. Like peas, habas can be harvested green or dried and threshed as grain. However, Melgueños receive such good prices for green habas--especially those produced during the winter (irrigated) season when market prices are highest--that only a very small fraction of total production is dried, and only for family consumption rather than seed.

LAND PREPARATION: As with most other crops in Melga, there are two seasons for growing habas. The first is the rainy season or jatun tarpuy (large planting) beginning in September and running until March-April. The second is the miskha or irrigated season, beginning in the first of the year (January-March) and running through June. For the rainfed crop, it is customary to conduct an irrigated soaking of the field to be planted in the period May to July, followed by a first plowing, then a second soaking a month later accompanied by a second plowing. This two-step tillaging process helps to expose and kill harmful soil pests as well as fertilize the soil with crop residues that have been plowed under.

The irrigated haba crop is usually planted immediately after the harvesting of a potato or other (fertilized) tuber crop at the end of the calendar year. In this case the soil is completely soft and workable, requiring no pre-planting soil preparations.

PLANTING: Most households in Melga buy their haba seed from the community of Colomi; the preferred variety is Javilla, characterized by its large pods and plump beans three to a pod, which has very good market acceptance. The crop is planted much like corn. The ox-drawn plow begins the process by cutting furrows that follow the contour of the hillside and are about 15-20 centimeters deep. A planter (usually a woman) follows the plow-team, dropping seeds at 20-25 centimeter intervals using both hands. In fields determined deficient in nutrients--and exclusively plots subject to irrigation--an application of chemical fertilizer may be applied. This will be done by the third participant in the planting party, who follows on the heels of the planter. Finally, an optional fourth member of the

planting party is the chujchuquero, a man with a pick-hoe who extends the furrows in the turn-around areas at field boundaries. If this individual is not available, field boundaries can also be planted by conducting an orillada (edging) consisting of two transverse rows plowed after the entire field has been planted. When one furrow has been planted, the plow makes a return trip and covers the seed with dirt from a parallel but more superficial furrow. Following the furrowing, planting, and burial of the seed, the wooden plow will be detached from the oxen yoke and replaced by the now-familiar land leveling log or rodillo.

Based on records kept by Melga farmers, the seeding rate for habas averages about two arrobas (50 pounds) per quarter-hectare.

CULTIVATION TASKS: Habas sprout after 2-3 weeks. The first post-planting task is usually weeding, which must be conducted before the plants receive their first irrigation. Weeding is done with a well-sharpened hoe to cut down the weeds and grasses just below the soil surface. When the haba plants reach a height of 10-15 centimeters they are ready for their first irrigation or k'aspeo. Four or five days later the crop should be hilled. This aporque can be done by hand, using the chujchuka, or even better it can be completed with the ox-drawn plow. However, to keep the oxen from trampling the plants a shorter yoke is required than that used for normal tillaging. Such a special yoke is known as an aysa yugo (hilling yoke). In some cases the use of the ox-plow for hilling allows the farmer to eliminate hand-weeding completely. In highland haba plots, hilling with oxen is usually the only task conducted between planting and harvesting.

Habas used to have a reputation for being completely disease and pest resistent. But in recent years haba crops have begun to suffer a serious threat from a green worm known locally as khomer khuru, and in most lowland (irrigated) haba fields it is now necessary to fumigate at least once during the production period, and always at the point of flowering (two months after planting). Melga farmers use the same chemicals (Perfektion, Folidol), the same equipment (backpack sprayers), and the same application procedures as with potatoes.

Habas are also irrigated similar to potatoes. After the first irrigation, the haba crop will be given at least seven more irrigations, most of them at two-week intervals. Steeper plots or those with more porous soils may have to be irrigated as frequently as weekly. Finally, as the haba crop approaches harvestable age it is necessary to set up bird defenses such as scarecrows, paper flags and cloth hung on string about the field, and the presence of children with slings.

HARVEST TASKS: About 120 days after planting, winter habas can begin to be harvested green. Like peas, there is a wide flowering period which subsequently results in several pickings spread over a period of a month or more. The harvester carries a basket or a waistbag. He or she should be able to pick with both hands, using the thumb nails to pinch off the pods from the plant stalks without damaging still-maturing pods. Normally, families in Melga will pick green habas 1-2 days before a market day. Quantities of green habas marketed rarely exceed a carga (150 pound sack) for any single family on a given market day, unless prices are exceptionally high. The bulk of green haba production will have been marketed by the end of June. The preferred market for this crop is the city of Cochabamba, where it is sold almost exclusively by women. A quarter-hectare plot of habas can easily yield some 1,125 pounds of green produce, which represents a return of about 23 arrobas for each arroba of seed planted.

The harvesting of green habas concludes once the pods have dried to a greenish-black, which signals they are ready to be cut down. The reaping of habas is done with the hand-sickle. The stalks are cut about 10 centimeters above ground level and then stacked upright in kalchas. The pods and stalks are left to further dry in the field for at least a month (sometimes as long as three months). The crop is then transported to the threshing floor. A large crop will be threshed by animals, a small crop with sticks or simply by foot trampling. Like peas, habas are considered easier to thresh than wheat or oats because their pods are brittle and separate easily. However, because haba plant stalks are heavier than other cereal straw, a considerably stronger wind is needed in order to winnow them. Once completely dry, habas are so hard that they can be stored in any dry corner of the farmhouse, because rats will not eat them.

Harvesting Green Habas

PEANUTS (MANI)

Peanuts are grown by practically all families in Puca Puca, but not in Huayculí or Melga. However, plots are quite small and seldom exceed a quarter hectare. Peanuts are a highly prized crop. In ground form (after toasting) peanuts make a hot drink which some households consider their "chocolate". To celebrate All Souls Day, peanuts are used to make a special chicha (grain beer). For the mid-day meal, peanuts prepared as a sauce often replace meat. But perhaps the most common form peanuts are consumed are as a snackfood, particularly by children who attend school. For this reason it could be considered the children's crop, and most of the harvest labor is provided by children as well.

LAND PREPARATION: Peanuts are planted in December, so land preparation must begin with the first rains following All Souls Day (November 1). Usually two separate tillages are required, and sometimes three, leaving time inbetween for the soil to "mature". As with all other crops in Puca Puca, plowing is conducted with the ox-drawn plow.

PLANTING: Peanuts take six months to produce, a little longer than corn, so they are planted before and harvested after the corn crop. Planting is conducted with the ox-drawn plow and a single planter. The plowteam cuts a furrow about 15 centimeters deep, the planter drops the seed, and on its return trip the plow cuts a parallel furrow to bury the seed in the first. No fertilizer or manure is used on peanuts. In fact, farmers say that peanuts only produce on "unimproved" soils. Like corn, there appear to be two seeding techniques. Some families prefer to plant the seed in a continuous row at intervals of 3-5 centimeters between seeds. Others plant in hills, using 2-3 seed at a time every 20 centimeters or so. The seed itself has been saved from the previous year's harvest, stored in its shell, and then shelled and selected just prior to planting.

CULTIVATION TASKS: The peanut plants sprout at about 10-14 days. The first task will be weeding. The grower waits until after a rain and then while the soil is still damp removes the weeds with a hoe. About a month after planting, the peanut crop should be hilled. For larger fields the hilling is usually completed with the ox-drawn plow; otherwise the task is done with a hoe. Either way, the task is known as sucachada. Normally a second weeding is required after hilling, but this time the grasses or other undesireable plants are pulled by hand. All hilling and weeding

tasks are performed following a rain. The major insect pest which effects peanuts are ants, which are controlled at the nest. In Puca Puca the peanut crop is not fumigated.

HARVEST TASKS: Peanuts are normally harvested in May or June. Harvesting proceeds in two stages. First, adult workers with pick-hoes dig up the plants one at a time. This is done by delivering a blow to either side of the plant, then a final blow on the third side to lift and pull the plant out of the ground. Following behind the diggers come the collectors. Known as palladores, these harvesters are almost always women and children. One plant at a time, the pallador plucks off the peanuts until the vine is empty. The harvester may also shake the plant to loosen soil which may be hiding a pod here and there. Once the plant is clean, the harvester pokes and works over the dirt in the furrow--using a shovel or hooked stick--looking for any additional peanuts that may have come detatched from the plant. This second search is called chajmeo. A child can normally harvest about one basket (about 25 pounds) of unshelled peanuts in four hours, and each basketload will yield about six pounds of shelled peanuts. If a harvester is working for payment, he or she is allowed to keep one-third of the quantity picked. Plant stalk residues are served to livestock.

After collection, the peanuts must be taken back to the farmhouse and left to dry in the sun. In the case of fairly damp produce, the crop must be allowed to dry 3-4 days; in contrast, produce from a dry field can be adequately air-dried in a single day. The household then selects the harvested produce into three categories: seed, sale, and home consumption. Seed peanuts are left in their shells, as are those destined for home consumption. Peanuts for sale are usually shelled and even toasted, then sold at the Aiquile sunday market--usually by the pound--or bartered for sugar, rice, and other staples.

Children Harvesting Peanuts

OCAS

Ocas are tubers which resemble short, fat carrots, only they are usually yellow or pink in color. When sun-dried, ocas acquire a sweet taste that provides a pleasant variation in the diet of the farm family. Normally, ocas are only grown in cold, damp highland locations, and for this reason the crop is most commonly associated with the Altiplano rather than the Temperate Valleys region. However, because they control a high-altitude production zone, farmers in Melga are able to grow ocas. Nonetheless, the plantings are quite small--averaging about 400 square meters--and are grown almost exclusively for family consumption.

LAND PREPARATION: Land preparation techniques for oca vary according to where the crop is grown. If grown in the highland estancias under rainfed conditions, usually two tillages are conducted with the first rains of October. Otherwise, land preparation in irrigated plots may begin in March (following the harvest of the rainfed potato crop), or in August and September (after the harvest of miskha crops), again with two separate tillages but accompanied by a land-leveling with the rodillo. If ocas are planted following wheat, corn, habas, or peas, soil tillaging depth is more superficial--about 10-15 centimeters. Following potatoes or onions in improved (fertilized) soils, tillaging will be almost twice as deep. It is also customary for women and children to follow behind the plowteam pulling all grasses and weeds. This pre-planting weeding is known as grameando.

PLANTING: Melga residents produce oca for seed to be sold to other communities, but they prefer to buy elsewhere the oca seed they plant themselves. Like potatoes, oca seed should be plump, of medium-size (or tanteo meaning neither large nor small), with lots of eyes, and free of any damage or rot. It is not disinfected or treated in any way. The crop is planted with the ox-drawn plow in furrows cut 20-25 centimeters deep and about 40 centimeters between furrows. The planter follows behind the plowteam, dropping the seeds with both hands with a spacing of about 30 centimeters--when planted in "hills" of 2-3 seeds each--and only 10 centimeters when planted in a continuous row. Usually one melga (field section) of 4-6 furrows is seeded at a time; then the plow returns to bury the seeded furrows by cutting parallel furrows. A typical 400 square meter plot of oca will require half a day of plowteam and a half-carga (about 112.5 pounds) of seed to complete. No fertilizer or manure of any kind is applied. Many households prefer to conduct an associated planting, seeding one row of quinua or corn for every 4-5 rows of oca. When the entire plot has been

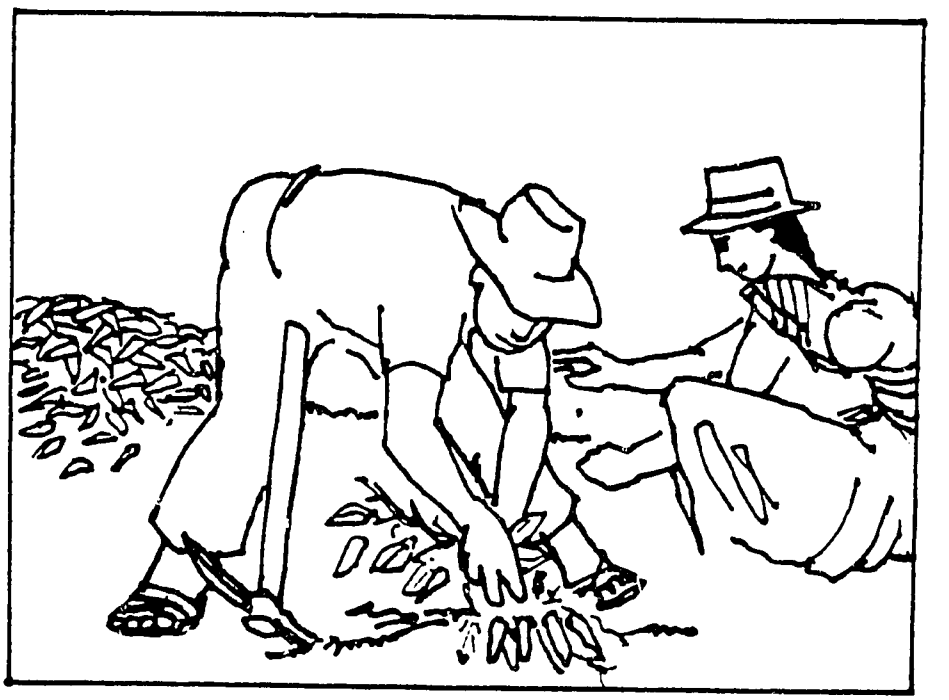
has been seeded and the furrows closed, the final task in irrigated fields is to level the soil surface with the rodillo. In highland, rain-fed plots it is not necessary to smooth the soil surface.

CULTIVATION TASKS: If grown under irrigated conditions, ocas usually require three irrigations, the first coming just after the crop has sprouted, the second to facilitate weeding or hilling tasks, and the third at flowering stage. Ocas usually require two weedings and two hillings. The first weeding comes about 30-45 days after planting and is conducted with hoes. The first hilling comes at about 75 days after planting. For larger plots it is best to use the ox-drawn plow for this task, but normally only the chujchuka (pick-hoe) is used. The second weeding is usually done a little bit at a time, with the weeds and grasses harvested as forrage for livestock. The second hilling comes at about 125 days after planting. Using the chujchuka, abundant soil is heaped around each plant base until it resembles a pyramid with leaves growing out the top.

Ocas are attacked by two different kinds of worms: jullu and silvi k'uru. The first seems to make its appearance under conditions of excessive moisture. Nothing is done to control it; oca crops are seldom fumigated. In contrast, the silvi k'uru appears as the result of insufficient moisture, the worms invading the inside of oca tubers to escape from the dry soil outside. To control the latter pest, farmers simply conduct an irrigation (if water is available) or wait for rain.

HARVESTING TASKS: When oca plots are located in reasonable proximity to the farmhouse, it is customary to cut down the plant stalks as they begin to turn yellow. The task is known as the corte de aylinco and the stalks (as with potatoes) are served as fodder to livestock. The digging of ocas resembles that of potatoes. First, several cayanas (produce collection floors) are constructed at strategic locations in the field. Next, the oca plants are uprooted one at a time using the chujchuka. The harvester straddles the furrow. He delivers a blow with his pick-hoe deep to the left of the plant, then another to the right, and finally with a third straight-on blow he gets under the root system and pulls the plant and its tubers out of the ground. At this point the harvester rests the handle of the chujchuka against one thigh, leaving both hands free to sort through the plant roots and dirt to pick out the ocas. When this is finished he conducts the thamiy or second turning-over of the soil in search of any tubers which may have been left behind. The tubers are tossed one by one into or near the cayana. There they are left to dry in the sun for several days--a process known as khalinchada--which causes the ocas to acquire a sweet taste. For oca crops planted in September-October, the above tasks are normally conducted over a period of 200-260 days after planting.

After they have sun-dried, the harvested ocas are selected for use as seed, for family consumption, and--if the harvest was abundant--for market sale. Of the ocas reserved for family consumption, normally the smallest and poorest quality produce is set aside to be eaten first--particularly ocas that are partially rotten or wormy. Ocas are stored inside adobe bins located inside the farmhouse.



Harvesting Ocas

A 400 square meter plot of oca will require a half-carga of seed and yield about 11 cargas of fresh produce, which represents a return of 22 pounds for every pound of seed. In 1979-1980, for example, Arturo Rojas of Melga planted one-half a carga of oca in the location known as Collpana. He employed 13 days of family labor and two of hired workers, plus one day of yunta and another of burro to bring home the harvest. For his efforts Arturo earned a net income of 3,510 pesos or US$140 for the eleven cargas of oca harvested. This amounts to 270 pesos (US$10.80) for each day of family labor invested, which represents ten times the value of the daily wage payment for hired workers in Melga.

ONIONS

Because of their access to irrigation water, most households in Melga grow onions. A few families in Puca Puca also grow this crop because they have acquired small irrigated plots in the neighboring district of Cercado. Onions are mostly produced for commercial sale. The onion nurseries are usually started in October to be ready for transplanting in January; the traditional harvest period occurs in May. Onion plots are generally quite small, the average in Melga being about a quarter-hectare, with harvest yields for such plantings reaching 10-12 cargas (cargo sacks) by volume and up to 30 quintales (3,000 pounds) by weight.

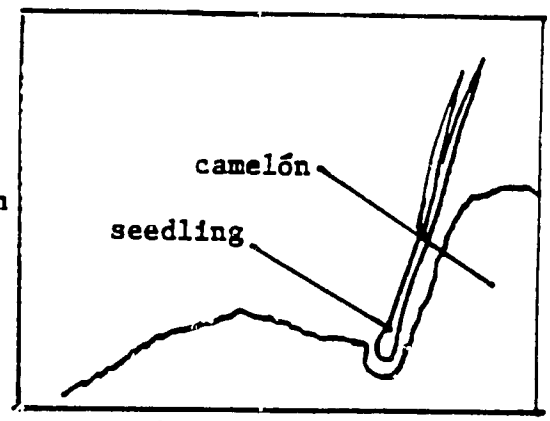
NURSERY TASKS: The onion nursery is constructed in a location exposed to direct sunlight from early morning to late afternoon. The soil for the nursery should we well-pulverized and mixed with compost. It is shaped into raised seedbeds known as cajónes and then compacted so that the edges are slightly elevated to hold in moisture when the seedbeds are watered. Each seedbed is usually about 1.5 meters long by about one meter wide. Once the nursery is ready for planting, the cajones are given a watering. The seed is then sprinkled over the seedbed surface as evenly as possible. Most onion growers buy their seed from Peruvian traders, the predominant variety being Arequipeña. After the seed has been sprinkled on the soil surface, it should be covered with a very thin covering of screened dirt. Some families next place a layer of straw over each seeded cajón; others place poles at the four corners of the nursery and then construct a roof made of branches or plastic. When a roof is used, it should be placed about a meter above the soil surface to facilitate subsequent waterings and weeding tasks.

Two days after planting, the seedbeds should be watered. At seven days the seedlings begin to sprout. When they reach three centimeters in height it is time to remove the covering of straw or the nursery roof. This protection should be taken away in the late afternoon so that the seedlings are not prematurely scorched by strong sunlight. Once the seedlings have sprouted, some farmers prefer to apply a sprinkling of manure to nourish plant growth. The entire nursery must be weeded as often as necessary during the next four to six weeks until the seedlings are ready to be transplanted. When the seedlings reach a height of 12-15 centimeters it is time to transplant them.

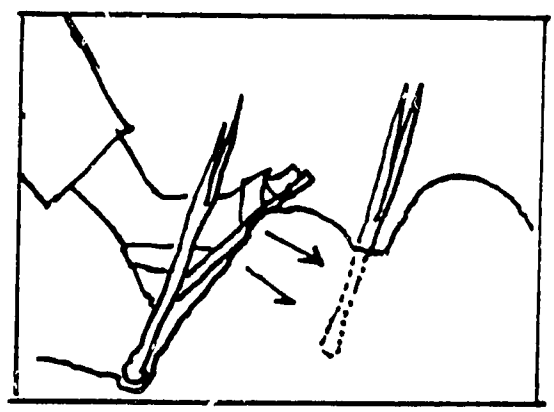
LAND PREPARATION: In Melga especially, onions are almost always planted in so-called "improved soils"--in the k'allpas where potatoes were previously harvested--to make use of any remaining fertilizer residues. The field destined for onion cultivation should be tillaged 2-3 times with the ox-drawn plow. During these plowings it is important to remove as many weeds and grasses as possible. Prior to the final reja (plowing), the soil should be well-soaked. A couple days later the last tillage will be conducted, followed by the leveling and the planting--all on the same day.

PLANTING: The furrows for onions are known as camelónes. They are usually constructed by hand using a pick-hoe. Each camelón is about 15-20 centimeters deep. On flat fields the furrow will be straight, but on hillside plots the furrows will be constructed following the countour of the slope or even in a zig-zag pattern to facilitate water control during subsequent irrigations. Each furrow is planted before the next one is constructed.

First, the seedlings are removed from the nursery. The quantity removed will depend on how many laborers are available and how much of the field can be planted on the same day. The seedlings are pre-selected for equal size and quality. They are then washed and taken in a basket to the planting site. The planter takes a handful of seedlings with his left hand, planting one seedling at a time with the right. If the seedlings are fairly large, they will be planted at intervals of 7-10 centimeters; if small or sickly, at closer intervals or two at a time. As each seedling is placed upright against the vertical side of the furrow, the planter pokes a hole in the soil with his thumb and places the seedling inside. When one furrow has been planted the next camelón is constructed, the dirt from which is heaped to bury the seeded furrow. Finally, the seedlings are held tightly in place by gently tamping or stepping on the soil that surrounds them. As soon as possible after planting, the field should be irrigated.



The Open Furrow


Closing the Camelón

CULTIVATION TASKS: Unless there is adequate rainfall, onions should be irrigated about once a week following transplanting. After the first two weeks it is usually necessary to begin weedings, a task done with hoes and trowels. At four weeks, or when the plants reach a height of 20-25 centimeters, it is time to conduct the first hilling, and 2-3 weeks later another hilling is required. In addition to heaping the dirt and loosening the soil to encourage plant growth, the hillings provide an opportunity to weed at the same time. There exists a worm pest, called camanchaca, which acts similarly to the jullu in potatoes and ocas--that is, it is caused by inadequate soil moisture. The camanchaca is controlled by more frequent irrigation. Onion growers in Melga sometimes fumigate their crop with Folidol to control other worm infestation. They also use Malathion to control ants in onion fields.

HARVESTING TASKS: Onions are ready for harvesting 4-5 months after transplanting. One signal of maturity is that the soil surface about the onion plants begins to split open; another is when the tips of some of the plant stems begin to yellow. Of course, the exact harvesting dates usually depend on when and how the crop is to be sold. Many families harvest their onions a fraction of the field at a time, removing only that quantity of produce that can be conveniently sold on the following market day. Others harvest all at once. Indeed, a common practice is known as arriendo (leasing) wherein the grower transacts with a buyer to purchase his entire onion field. In this case they buyer is responsible for harvesting the crop. He brings a truck and his own laborers into the community, or he may pay the grower a wage to do the harvesting for him.

To harvest onions, the field should be irrigated 1-2 days earlier in order to soften the soil. The harvester should remove each plant using both hands. One hand should hold the stem as close as possible to the base. The plant is gently tugged first to test if it will lift out of the soil fairly easily, then removed with a sharp two-handed pull. The produce is collected in a single pile. From there the onions are taken to be washed in the nearest irrigation ditch or river, a task known as runachando (beautifying) and usually assigned to women. After washing the onions may be tied together in amarros (bunches) of 4-6 heads in anticipation of their retail market sale. Wholesale onions are sold by weight in 100-pound units or quintals or in volume units known as cargas or pitucas. When sold by weight, onion stems must be removed. Volume onion sales include the stems. The carga has no specific weight equivalent in the case of onions; it is simply a cargo sack filled with this produce (although for other crops equivalencies ranging from 150-250 pounds do exist). As for the pituca, this is a woven mantle 1.5 meters square filled with onions. It is a unit considered roughly equivalent to a carga. There exists a tendency for onions sold by weight to be harvested later than onions sold by volume.

As an example of onion cultivation in Melga, we present the case of Raúl Rojas in 1979-80. On January 12, 1980, Raúl planted a field 800 square meters in area located in the zone known as Capilla. He prepared the nursery for this planting the previous October using a pound of seed. Land preparation and nursery tasks required 17 days of family labor, two days of yunta, and four hours of water. Raúl conducted three hillings, two weedings, one fumigation, and seven irrigations with this onion crop. These tasks required 13 days of family labor, a half-pound of insecticide (Dithane), and 28 hours of water. The field was sold in arriendo to an intermediary for 2,500 pesos (US$1,000) on May 8, 1980. Since the buyer did the harvesting, it is not known exactly what the crop yielded. However, in that year onion prices fluctuated between 200-250 pesos per carga, which suggests that Raul's field produced something like 10-12 cargas. Excluding the value of family labor, Raul's costs of production for the onion crop totalled 745 pesos (US$30). This left him a net income of 1,755 pesos, representing a return of 57 pesos (US$2.26) for every day of the 31 days of family labor invested in this crop.

Weeding Onions

CHAPTER IV.
LIVESTOCK PRACTICES

This chapter begins with a general description of livestock holdings in the three communities of Puca Puca, Melga, and Huayculi. The average number of animals, their value, and their importance within the total livestock inventory of each family is described. Next is presented a review of livestock marketing practices in the Valleys region--market participants, methods of purchase, market taxes, and special customs for concluding a sale.

But most of the chapter is devoted to a description of practices for ten different kinds of livestock. These include draft animals (oxen), milk and beef cattle, burros, sheep, goats, pigs, chickens, ducks, pigeons, and guinea pigs.

LIVESTOCK HOLDINGS IN THREE RURAL COMMUNITIES

During the course of the Traditional Practices Project the livestock holdings of 40 rural households from the Valleys region were surveyed on three occasions. Livestock inventories were prepared for 15 families in Puca Puca, 13 families in Melga, and 12 families in Huayculí. The first inventory was taken in August 1979, the second in December 1980, and the third in July 1981. The peso value of the animals was only recorded for the second and third inventories

In general, these communities represent three different levels of livestock holdings: large, medium, and small. The community with the largest holdings was Puca Puca, where the average value of the livestock inventory per family reached 68,380 pesos (US$2,735) as of June 1981. In contrast, the average value of family livestock holdings in Melga reached 48,315 pesos (US$1,933), while in Huayculí the average per family was only 8,115 (US$325). These numbers reflect major differences both in the numbers and kinds of animals raised from one community to another.

COMMUNITY OF PUCA PUCA

In Puca Puca the average family livestock holding included 9-10 cattle, four burros, 15 sheep, 15 goats, 5-6 pigs, and about 14 chickens. Four families out of the 15 surveyed raised a horse; similarly, four of 15 raised a flock of ducks.

Thirteen of the 15 families surveyed owned cattle. Their total holdings grew by 15 percent (from 98 to 113 head) between August 1979 and December 1980. A further increase of ten percent (to 124 animals) had occurred by June 1981. By that date the average value of cattle holdings per family was estimated at 52,649 pesos (US$2,106), which represented no less than 77 percent of the total value of all livestock holdings.

Ten of 15 families raised burros. Their combined holdings increased from 33 animals in 1979 to 42 animals in 1980, then declined slightly to 38 by 1981. The average holding was four burros per family with a combined value of 3,840 pesos (US$154) in 1981, equivalent to six percent of the total worth of the livestock inventory.

All 15 families surveyed in Puca Puca raised sheep. Over the period 1979-1981 the size of the average flock of sheep grew from 12 to 17 animals. By June 1981 the sheep holdings of the average family were valued at 7,242 pesos (US$290), which representd 11 percent of the combined value of all livestock owned.

Thirteen out of 15 families in Puca Puca also raised goats. The size of their combined herds grew from 124 goats in 1979 to 222 goats (79 percent increase) in mid-1981. By June 1981 the average goat herd was valued at 5,640 pesos (US$226), equivalent to eight percent of the value of all livestock holdings.

In 1979, ten out of 15 families surveyed raised pigs, and by mid-1981 all 15 households were raising these animals. Total holdings increased over the period from 23 to 83, so the holding of the average family grew from two to five animals. The average value of pig holdings was 2,497 pesos (US$100) in June 1981, which amounts to four percent of the total worth of all family livestock.

All 15 families raised chickens. Their combined flocks totaled 188 birds in 1979, grew to 257 birds in 1980 (37 percent increase), and then declined to 182 by mid-1981. At that time the average value of the family poultry flock was 1,380 pesos (US$55), equivalent to two percent of the value of all livestock holdings.

The above-mentioned livestock enterprises constitute the normal holdings for most families in Puca Puca. But in addition to these, horses and ducks were raised in significant numbers. Four families raised horses, and their total holdings increased from six to ten of these animals between 1979 and 1981. The average value of horses owned per family reached 12,750 pesos (US$510)--making this the second most valuable enterprise in the family livestock inventory after cattle. As for ducks, four families raised them in 1979, but only two continued to raise them in 1981. During this period the total number of ducks declined from 22 to 18, representing an average asset value of 1,130 pesos (US$45).

Unlike residents of Melga and Huayculí, families in Puca Puca do not raise guinea pigs; nor do they raise pigeons, as in Huayculí. On the other hand, Puca Puca is the only community of the three where goats are raised.

COMMUNITY OF MELGA

Of the 13 families surveyed in Melga, the average household raised four cattle, a burro, two dozen sheep, 2-3 pigs, and a dozen chickens. Seven families raised ducks (about six apiece), seven raised guinea pigs (about 23 each), and two families owned a horse.

All of the 13 families raised cattle. Their combined holdings grew from 36 animals in 1979 to 52 animals by mid-1981, an increase of 44 percent. As of June 1981 the average value of cattle holdings per family reached 32,860 pesos (US$1,314). Although the average number of cattle owned is less than half the number in Puca Puca, the average value of each animal is much higher. In mid-1981 the average worth of each head of cattle in Melga was 8,215 pesos (US$329), while in Puca Puca the figure was only 5,542 pesos (US$222), or 32 percent lower. This difference reflects the presence of improved-breed dairy cattle in Melga versus the predominantly criollo or unimproved local breed cattle of Puca Puca. For the average family in Melga, cattle holdings represent 68 percent of the combined value of all livestock owned.

Six of 13 families surveyed owned a burro, for which the average value was 2,200 pesos (US$88) in mid-1981. This represents three percent of the total value of all livestock owned. Ownership of horses was limited to two families (with three animals) in 1979, but by mid-1981 only one family owned a single horse, which was valued at 5,000 pesos (US$200).

After cattle, the most important livestock enterprise in Melga is sheep. All 13 families surveyed kept a flock of the animals. Their total holdings were 244 sheep in 1979, which then grew to 310 sheep in 1980 (27 percent increase) and then declined to 289 animals by June 1981. The size of the average flock was 22 sheep in mid-1981 with a combined value of 10,274 pesos (US$411). This figure represents about 21 percent of the total worth of all family livestock assets.

Seven of 13 families raised pigs, although total holdings declined from 23 animals in 1979 to 13 animals in mid-1981. With an average of about two pigs per family, the total value of the typical household's pig holdings was 2,920 pesos (US$117) in June 1981, which represents about six percent of the combined value of family livestock holdings.

Twelve of 13 families surveyed raised chickens. Total flock size declined from 87 birds in 1979 to 74 birds in 1980, then increased dramatically to 134 birds (an 81 percent gain) by mid-1981. The average value of the family chicken flock reached 1,287 pesos (US$51.48) in 1981, which represents about three percent of the combined value of family livestock assets.

Four families raised ducks in 1979, five in 1980, and seven in 1981. The average number of ducks raised per family declined from 11 to four over this same period. The value of the average holding in 1981 was 532 pesos (US$21) or about one percent of the worth of all livestock holdings.

Finally, seven families raised guinea pigs (called conejos, but not to be confused with rabbits) in Melga. Total holdings of these animals grew from 97 to 142 in 1981, an increase of 46 percent. The average holdings per family were 20 guinea pigs in 1981, having an approximate value of 700 pesos (US$28) per family, equivalent to 1.4 percent of all livestock assets.

COMMUNITY OF HUAYCULI

In Huayculí the average family had no cattle or burro or horse. Instead, livestock holdings were mostly limited to a flock of about a dozen sheep, 8-9 chickens, and/or about 8-9 pigeons. One out of every three families kept a few guinea pigs, a burro, or perhaps a pig. About one family in four had a single dairy cow.

With regard to cattle, the 1979 inventory listed only one family with holdings of two cows. As of December 1980 there were three cattle owners with a total of five animals between them. By June 1981 there were five cattle distributed among four families. At that time the average value per animal was 5,100 pesos (US$204), even lower than in Puca Puca.

Three families out of 12 owned a single burro. In each instance the animal's estimated value was 1,000 pesos (US$40), which amounts to about 12 percent of the total worth of the family livestock inventory. None of the surveyed families owned a horse.

Ten of 12 families in Huayculí raised sheep. The combined size of all herds increased from 89 animals in 1979 to 120 (35 percent growth) in 1981. The average number of sheep raised per family was 12 animals, valued at 5,800 pesos (US$232), which represents 71 percent of the combined value of all livestock holdings.

Four families in Huayculí raised a total of six pigs in 1979. In 1980 only three families (with four pigs) raised these animals, and by mid-1981 there were only two families (with three pigs). As of June 1981 the value of the average pig was 800 pesos (US$32), which is roughly equivalent to about ten percent of the value of all livestock holdings for the average family.

Seven of 12 families raised chickens in 1979, eight families in 1980, and six in 1981. Total flocks grew from 26 to 62 and then back to 52 birds over the period. In mid-1981 the average flock per family consisted of nine birds, valued at 594 pesos (US$24), equivalent to seven percent of the value of all livestock assets.

Five of 12 families raised pigeons in Huayculí during 1980-1981, but the presence of this enterprise was not reported in 1979. The total number of pigeons declined from 46 to 39 between 1980 and 1981. The holding of the average family consisted of eight pigeons for a combined value of 240 pesos (US$10). This represents about three percent of the value of total livestock holdings for the average family. It bears repeating that pigeons are only raised in Huayculí and are not found in either of Melga or Puca Puca.

Finally, four of 12 families raised guinea pigs, with total numbers of these animals remaining fairly stable at 30-36 over the period of the three inventories. The average holding per family in mid-1981 was nine animals valued at 333 pesos (US$13), or about four percent of total family livestock assets.

LIVESTOCK MARKETING

In most of the towns of the Valleys region where weekly market days are held, there usually exists an adjoining livestock market known as the playa del ganado. Such a market is normally located in a wide field which permits ample space for concentrations of hundreds of animals and even larger numbers of buyers and sellers. The playa is often divided into two sections: one for major livestock--cattle, burros, and horses--and another for minor livestock--sheep, goats, pigs, and others. The concentration of livestock sales in a single location permits local officials to collect market taxes and enforce price and sanitation rules more easily. The abundant space of the playa permits buyers greater convenience in reviewing available stocks for sale, for lassoing and observing animal characteristics, etc. Surrounding each playa is a strip of stores, stalls, or ambulatory merchants specialized in the sale of chicha, beer, wine, singani (brandy), and other beverages which are traditionally consumed at the conclusion of each livestock transaction.

The residents of Puca Puca buy and sell their livestock at the market in Aiquile. This is one of the most important livestock markets in the Valleys region because it is strategically located to attract cattle merchants--called mañosos--from the departments of Cochabamba, Chuquisaca, and Santa Cruz. Aiquile's playa de ganado occupies a hectare of land on the edge of town as one departs for the city of Cochabamba. At this location is also found a municipal slaughterhouse and, only recently inaugurated, a cattle vaccination center (SENARB) for the control of rabies, hoof and mouth disease, and brucellosis.

ORIGIN OF THE LIVESTOCK

It is customary for campesinos to replace their oxen when these animals have completed their useful work cycle, or after about 6-8 years of work (9-10 years of age). Such animals are known by the name matanza (slaughter). Although they are sold throughout the year, these oxen are marketed in greatest numbers at the end of the planting season. Similarly, the largest numbers of young steers and oxen are purchased during the second half of the calendar year--before the planting season--with allowance for enough time to conduct the amance de novillos or training of steers to pull the wooden plow. The timing of livestock purchases

and sales, and the preparations which preceed such transactions, usually display a high degree of rationality and planning on the part of rural households.

Aiquile is surrounded by a number of rural communities that are well suited for raising livestock due to their abundance of pasture land and monte or low forest. The Government has sent various commissions to Aiquile to purchase local cattle for breeding with improved stock destined for introduction and adaptation to the Chapare, a colonization area with climatic characteristics similar to those of the zone of Aiquile. Some of the principal communities supplying livestock to the market at Aiquile include Villa Granado, Pasorapa, Rodeo, El Villar, Umereque, Pasopaya, Novillero, El Puente, and Chinguri. There is also a cluster of communities from Valle Grande (Santa Cruz Department) which also supply large numbers of cattle to the Aiquile market.

MARKET PARTICIPANTS

In the first place there are the propietarios or owners of livestock. These are rural producers who wish to sell cattle in order to renovate their plowteams or dairy herds, or because they need cash for subsistence or emergency needs. The propietario is responsible for herding or otherwise transporting his animals to Aiquile. It is the male head of household who is normally entrusted with the task of marketing cattle, horses, or burros. Women are usually responsible for the sale of other livestock such as sheep, goats, pigs, and poultry--as well as livestock products like wool, hides, cheese, and eggs.

Then there are the mañasos or cattle merchants. The term comes from the Spanish word maña meaning cleverness or cunning. The smallest mañasos are merchants from nearby communities who buy cattle directly from neighbors and resell the animals in Aiquile. Some of these merchants are also small farmers and ranchers themselves, producers who are different from propietarios only because they are more frequent participants in the livestock market and handle larger numbers of animals.

Vallunos is the name given to mañasos who come from Cochabamba, Punata, Cliza, Sacaba, and other parts of the Valleys region to purchase cattle in Aiquile for resale elsewhere. Working with greater amounts of capital, these merchants often use their own or rented trucks for transporting cattle acquired in Aiquile. On Sunday afternoons (following the close of the cattle market), one will see large numbers of trucks heavily loaded with livestock thatleave Aiquile bound for Cochabamba and elsewhere.

Finally there are the Alteños. These are mostly cattle buyers who come from the highlands in search of novillos (young steers) suitable for plowteams in the Altiplano. The Valleys region is a major supplier of draft animals used by highland producers. Most Alteños are not livestock merchants by trade but rather farmers who prefer to hand pick their draft animals and transport them home under their own supervision. However, some Alteños are mañasos who buy cattle for slaughterhouses in La Paz and the major highland mining centers.

Cattle marketing is a high-risk, high-gain profession. For every mañaso who prospers at this trade there is probably another who goes bankrupt. These merchants must be very knowledgeable as well as cunning. First, they need to know a great deal about animal health in order to avoid purchasing stock which is diseased. Second, they have to masters of price bargaining, good students of human nature, and able to finalize transactions swiftly. Third, the mañasos must know a great deal about market price behavior on both a daily and seasonal basis, as well as differences in prices between markets, knowing when to hold back and when to be act decisively. Fourth, they have to be quite skilled in the transport and management of livestock. When penned in close quarters inside a cargo truck traveling bumpy, curving roads, cattle can easily become fatigued, suffer accidents, and experience rapid weight loss. For long hauls the merchant must plan carefully, making arrangements in advance for resting, corraling, feeding, and watering his livestock. The longer a mañaso stays in business, the greater becomes his market experience and his advantage over newcomers among the competition.

METHODS OF PURCHASE

There are two methods of finalizing cattle market transactions--by cash advance or by payment in full. The payment of an advance, known as a seña, is most commonly practiced by local market intermediaries. The buyer goes around the playa inspecting different herds of cattle, and when he is able to strike a bargain for a certain animal he pays its owner an advance which is about 5-10 percent of the price. This payment means that the owner is practically certain of making a sale. Nonetheless, it sometimes happens that the buyer is able to strike an even better bargain with another seller later in the day. If the latter transaction is favorable enough, the buyer may actually choose to forfeit his advance to the first seller; in this case the seller may have to hold on to his animals until the following market day.

In early 1981 the value of a seña ranged from 100 to 500 pesos (US$4-20) at the Aiquile cattle market. By paying señas, it is actually possible for a merchant to conduct in a single day market transactions involving several times his own operating capital. For example, after obtaining

--through señas--the purchase rights to, say, a dozen animals from several different owners, the merchant can turn around and sell at a profit the entire lot to another (larger) cattle buyer. Thus, the merchant sells what he does not yet own, then takes the money and buys what he has already sold.

Cash payments in full are normally made by farmers seeking to buy 1-3 animals for renovating a dairy herd or plowteam. The Alteños always purchase animals in this fashion. The interested buyer roams the market investigating the available animals until he locates what he wants. He then enters into discussions with the owner regarding the price. Here is where one's bargaining skills are best displayed. The seller brings into the discussion all the possible virtues of the animal under consideration, while the potential buyer attempts to identify all its observable defects which might merit a price reduction. Frequently the discussion will take place not between two but perhaps three or more participants. The seller may employ a member of his family to pretend he is another buyer interested in purchasing the animal; the potential buyer may similarly use a companion to assist him in advancing his arguments.

PAYMENT OF TAXES

The marketing of cattle involves the payment of taxes. These are sometimes equally shared between buyer and seller, other times by one or the other. In Aiquile there are two market taxes: the boletaje (ticketing) and exportación. These must be paid at a control station located at one end of the playa following the conclusion of each sale. The boletaje is usually paid by the seller when market prices are stable or rising, and by the buyer when market prices are falling. In early 1981 the tax was 60 pesos per head for steers (slaughter cattle or novillos) and 70 pesos for cows. The exportación tax is charged on locally-produced animals that are being "exported" out of the province to other parts of the Valleys region or outside the region itself. In early 1981 this export tax cost 70 pesos per animal. For reasons of security, each tax receipt carries a variety of information including the transacted animal's size, sex, color, age, brand, as well as the names of both the buyer and the seller. On any given market day in Aiquile, some 150-200 head of cattle will be sold. Such a volume would imply a weekly tax revenue to the municipality of Aiquile in excess of US$800.

CATTLE CHARACTERISTICS DESIRED BY BUYERS

If a buyer seeks to acquire a steer for his plowteam, he will be interested in judging the animal's hair, horns, hooves, color, and age. Hariness is regarded as a sign of a hardy animal; it is particularly important to buyers from the Altiplano. The horns should be upward slanting, which facilitates the securing of the yoke (which is tied to the horns), and is also considered a sign of animal head-strength. The hooves should be large and wide, assuring better support and stability of the draft animal. Buyers prefer steers with attractive colors or those which make the animal easy to recognize . Finally, the novillo should be at least two years of age, but some buyers may not put them to work before their third year because it is said such premature labor will destroy the animal's posture and hooves, causing it to remain short-statured.

Cattle for slaughter should be large, fat, and have a shiny hide. The larger the animal the better the price, because its individual cuts will weigh more after butchering. The fatter the animal the better, because housewives prefer cuts with abundant fat. Among cows, those that are sterile--called jorras--are very popular because they tend to be much fatter than normal animals.

TOASTING THE CATTLE SALE

Throughout Bolivia it is customary to celebrate the conclusion of a cattle sale with a ch'alla or toast with alcoholic drink between the parties to the transaction. Once a price has been agreed, the buyer must invite the seller to a bottle of beer, a pitcher of chicha (grain beer), or a glass of singani (grape brandy). A cattle owner with several animals to sell must have a great tolerance for alcohol if he is not to become inebriated prematurely before transacting all his business. For in addition to the toast invited by the buyer, the seller often will return the gesture. The women selling alcoholic beverages (they surround the playa itself) are experts at tempting and pressuring their clients to drink multiple rounds.

The first drink, of course, is the official toast. The seller takes his glass and pours a portion of it over the body of the animal he has sold. At the same time he asks that the animal be a good worker, or yield profits for its owner, or produce strong offspring, etc. Upon concluding this toast, the seller must then finish his drink--often with uninterrupted swallowing once the glass has touched his lips.

CATTLE: DRAFT ANIMALS

HOLDINGS

In Puca Puca, the typical family has at least one plowteam or yunta, and a few households have as many as three. Out of 15 participating households, 13 raise oxen and steers. The average cattle holding--including cows--is eight animals, with herd size ranging from 2-21 animals. In Melga, all households have a plowteam. The average family raises four head of cattle, two of which are oxen. It is only in Huayculí that cattle holdings are negligible. Out of 12 families surveyed only three had cattle, with each having a single cow. To meet their plowing needs, the residents of Huayculí must rent tractor or oxen services from outside the community.

USES

Of course, the primary use of oxen is for plowing tasks. In Puca Puca it is customary for the family without draft animals to rent a plowteam for the entire plowing season, which cost about 2,000 pesos (US$80) in 1981, or on a daily basis for 80-100 pesos (US$3.20-4.00) for about six hours of work. It is also possible to acquire additional plowing services in exchange for human labor. The exchange is 1.5 days of human labor for a single day of plowteam. The practice of acquiring oxen services in this fashion is known as yunteando (plowteaming). The more oxen days one acquires before the beginning of the plowing season, the more control one has over tillaging and planting operations--thereby allowing farmers to take fullest advantage of opportunities created by unexpected rainfall.

After plowing, the next important use of oxen is for threshing of grain crops such as oats, wheat, barley, peas, and broadbeans. Furthermore, from a single draft animal it is possible to collect 10-15 cargas (about 1,000-1,500 pounds) of manure. The useful life of an ox is 9-10 years and sometimes as long as 12 years. However, most farmers prefer to renovate their draft animals after 6-8 years. In the case of Melga, plowteams are used much more intensively because crops are grown the entire year; and because they work their oxen so hard, farmers will renovate a plowteam after only 3-5 years of work. In any event, a used ox can be sold as a matanza (slaughter animal) or its meat and hide utilized by the farm household.

TRAINING OF YOUNG STEERS

Before a young steer can be used for plowing, it must be trained to carry the yoke and pull the plow in unison with another draft animal. The task of training young steers is known as amanse de novillos (taming of steers). At the farmer's preference, the training will be conducted after the animal reaches two years of age and usually before it is three years old. In Puca Puca, the normal month for steer training is November, just before the arrival of the first rains and the start of the plowing season; in Melga, the training occurs anytime during the year when family members can spare the time from their other labor responsibilities. The easiest way is to train young steers one at a time by yoking them with experienced draft animals. However, it also happens that a plowteam of two young steers must be trained at the same time.

The amanse begins with the lighting of a candle and a prayer to San Isidro, the patron saint of farmers, imploring that the training will be swift and successful and that the new plow animal will be strong but without mañas (tricks, mischief). Next, the young steer is yoked to another animal, but without attaching the plow. A rope is tied to the neck of each animal; each rope end is held by an assistant. The plowteam is then taken to an empty field and driven around and around until the novillo eventually tires. At first, the young steer will buck and kick and shake its head, but eventually it will get accustomed to keeping in step with its companion. After the plowteam has been run about for an hour or so, it will be allowed to rest--but with the yoke still attached--allowing the two animals to become even more accustomed to each others movements, but without external pressure.

The following day the plowteam will be yoked together again. This time the wooden plow will be attached to the yoke, but without attaching the plowshare. Again the animals will be driven around the field for a few hours. Before the end of the second day of amanse it is usually possible to attach the plowshare and have the plowteam plow several furrows together. On the third day the plowteam will construct a small melga (field section) of 4-6 furrows; then, after resting, a larger melga of perhaps 8-10 furrows will be plowed. By the fourth or the fifth day the plowteam should be ready to plow for a full day. It is only after it has learned to work that the young steer is castrated and thus becomes an ox.

A final element of control by the plowman--both during amanse and subsequent plowing--is the chaqui lacero or foot rope. One end is attached to the right foot of the novillo, the other end held by the plowman. The purpose of this rope is to teach the young plow animal to turn around sharply at field boundaries. Another way of guiding the plowteam, which replaces the rope, is for an assistant to walk in front of the draft animals.

PASTURE, FEEDING, AND SHELTER

Cattle raising methods are quite different between Puca Puca and Melga; and the raising of oxen reflect these differences. In Puca Puca there exist two very distinct seasons with regard to care of livestock. Because stray cattle are a serious threat to growing crops, from November to June (the cropping season) farmers take their cattle herds to the monte. This is the name given to mountainous, low-forest grazing areas located anywhere from 10-30 kilometers from the community. Following the harvest, cattle are returned to the community between July and October, where they are left to graze on the crop residues left in the fields. The only exceptions made in this schedule are for oxen--which must remain behind from November through January to conduct land preparation, planting, and hilling tasks--and cows that are just about to give birth (or have just given birth). It is precisely to feed their oxen that farmers in Puca Puca harvest part of their chala (corn crop residues), storing it in piles known as pilónes which are located in trees (see CORN, Chapter III).

In Melga, all cattle--including oxen--remain in the community. Oxen are usually housed in a stable beside the farmhouse. Fodder and sometimes their water is hand-carried to them. When not needed for plowing, oxen are pastured with other livestock along field boundaries, in the stubble of harvested crops, or in terrenos ideasos (lands in fallow). In addition to corn stalks, oxen in Melga will be fed weeds and grasses (following weedings), aylinco (potato plant stalks), cebada en berza (green barley), oats and wheat straw, and the stalk residues of peas, broadbeans, and other crops following threshing.

When left to forrage for themselves, oxen graze much like other cattle on a more or less continuous basis. But on a work day, the feeding requirements of an ox are quite specific and require narrow scheduling. The farmer first determines where the plowing task will take place and its starting time--say, an hour's walk from the farmhouse at 10 O'clock in the morning. Since oxen eat very slowly, they must be allowed 2-3 hours to complete their morning feeding, which will consist of a k'epi (one armload) of fodder or chala. The above requirements would make it necessary for the oxen to begin their morning feeding by 6 A.M. If a longer work day is anticipated, or if the work site is even further away, it is sometimes necessary for a member of the farm household to wake up and feed the oxen as early as 3 or 4 A.M. When an ox has eaten its full, the animal signals this condition by moving the fodder about with its hooves. Normally, another armload of fodder or chala will be consumed by the plowteam during the mid-day rest period. A third feeding--even more abundant than the morning meal--will be served the oxen at day's end. Since

oxen go to sleep at nightfall, their afternoon feeding and watering must also be carefully scheduled, which in turn will place a limit on the length of the workday. For example, assuming nightfall at 8 O'clock P.M., plus at least three hours for eating the evening meal, and an hour's travel back from the work site, the plowing task would have to end by around 4 O'clock in the afternoon.

DISEASES AND AILMENTS

The health problems experienced by oxen are generally the same as with other cattle, which are addressed in the following section on MILK AND BEEF CATTLE.

MARKETING

A two-year-old novillo could be purchased at the Aiquile market in 1981 for 4,500 pesos (US$180). An experienced draft animal at its prime working age could be sold or purchased at Aiquile for about 8,000 pesos (US $320). Some families in Puca Puca raise their own plow animals from birth. These are criollo (local) breed steers which are half-wild, for they have spent more than half their lives in the monte. They are tough and powerful animals but fairly difficult to train for the plow. Residents of Melga seldom raise their own steers because forrage and pasture resources are too scarce. Instead, they usually buy their novillos at the local cattle markets of Punata, Cliza, or Cochabamba. A few farmers will travel as far as Aiquile or even the Department of Santa Cruz (Valle Grande) to hand pick their draft animals. Animals purchased at such distant locations are called novillos arreados (steers from a cattle drive).

Because plow animals are so expensive to purchase, it is a common practice in Melga for two families to acquire a plowteam on a joint ownership basis. Another practice is for one of the two families to take responsibility for financing the purchase while the other takes charge of the animals' maintenence. In the latter case, for example, the buyer of a novillo will pay 2,000 pesos and later sell the animal for 8,000 pesos; after subtracting the initial investment, the remaining 6,000 pesos will be split equally between the buyer-owner and the caretaker-owner. Moreover, during the period of possession, both co-owners have equal rights to using the draft animal. Still another alternative is for two separate families to each purchase one draft animal apiece, then combine them to form a single plowteam which is shared. A final custom is for the caretaker family to pay the owner of a plowteam with land, seed, and a harvest share of a given crop in exchange for use rights to the other family's yunta.

MILK AND BEEF CATTLE

HOLDINGS

In addition to a team of oxen, most families from Melga raise one or two milk cows. These are mainly of local breed or criollo stock, but several households manage improved or purebred cows of the variety Holandesa. The raising of larger herds of cattle would be impractical in Melga because of the scarcity of fodder supplies and grazing land. Furthermore, agricultural activity is so intense in this community that it would also be impractical for its residents to graze cattle at distant locations.

The only cattle raised in Huayculí are milk cows. However, only a few families have them, and only one animal apiece.

In contrast, residents of Puca Puca raise relatively large herds of cattle. Of 15 families surveyed, 13 have cattle—with the average herd size (including oxen) reaching eight animals. Half of all holdings consist of oxen or steers; the average family therefore has about four cows. Nevertheless, despite their larger cattle herds, residents of Puca Puca are primarily farmers, not cattle ranchers. For them, cattle raising is a sideline activity conducted under very casual technical and supervisory conditions. For half the year the cattle herds of Puca Puca run loose in distant grazing lands or monte located 10-30 kilometers from the community. There they may be visited by their owners only once or twice a month. The other half of the year Puca Puca residents graze their cattle close to home, in the field where crops have been harvested and residues left behind. For this reason it is common for farmers in Puca Puca to refer to their crop lots as potreros (pastures) rather than the more commonly-used terms of lote or chacra or terreno.

USES

In Puca Puca, the primary function of both milk and beef cattle (excluding oxen) is that of a savings account. When the household runs out of agricultural produce it can barter or sell to meet consumption necessities, only then will it sell an animal. Herd size is an important indicator of social as well as economic status in the community. The milking of cows is really of secondary importance because criollo breeds raised under wild conditions or on dry chala (corn stalks) produce very low milk yields—usually no more than three liters per day. When cows are milked, most of the milk is made into cheese. Fresh milk is consumed for breakfast

but not on a routine basis. On fiesta days it is customary to celebrate with a drink called ambrosia, which is prepared by filling a glass with milk directly from the udder, then mixing it with sugar and grape brandy (singani). As a byproduct of cheese-making, the suero (whey) is used as a medicine to treat fevers. Because cattle are seldom corraled near the farmhouse for any long period of time, they make a minor contribution to the farmer's manure supplies.

In Melga the uses of cattle are almost reversed in order of importance. There the maximum production of milk is a central concern of most families, particularly those which have acquired improved breed dairy cows precisely for this purpose. These animals are fed continuously throughout the day, and their fodder is often supplemented with loads of alfalfa purchased from outside the community. They are milked twice a day and may produce as many as 20-25 liters daily. As in Puca Puca, the milk from Melga is made into cheese and sold at local markets; it therefore constitutes a primary source of weekly cash income to the farm household. Since cows in Melga are always corraled next to the farmhouse at night, they produce large amounts of manure--estimated at 10-15 cargas per year (2,250--3,375 pounds). Because of the year-round cropping activities in Melga, cattle manure is a highly-prized resource.

BREEDING, GESTATION, AND POST-NATAL CARE

In Puca Puca, cattle are left alone to breed in the monte. The breeding season is considered to begin around the time of Saint John's Day (June 24th), with offspring born around Carnival (mid-February). The gestation period is considered to be nine months for cows and ten months for steers. Cows begin to breed after the age of three years, sometimes even earlier. After giving birth, a cow is physically capable of becoming impregnated again within a period of three months, but in Melga most families will refrain from breeding their cows for at least six months, while in Puca Puca unsupervised breeding usually results in the birth of cría (offspring) every 18-24 months. Cows raised in Puca Puca are normally sold after they have produced three offspring (8-9 years of age), while in Melga at about ten years of age.

When a cow is pregnant and nearing full term, the animal's owners will bring it back from the monte so that its offspring will be born in the comparative safety of the farmhouse rather than exposed to the threat of foxes and mountain lions. However, since breeding is unsupervised and birthdates are imperfectly estimated, calves are often born in the distant forest grazing areas. In this case the mother and calf are brought home as soon as possible, both for safety reasons as well as for milking.

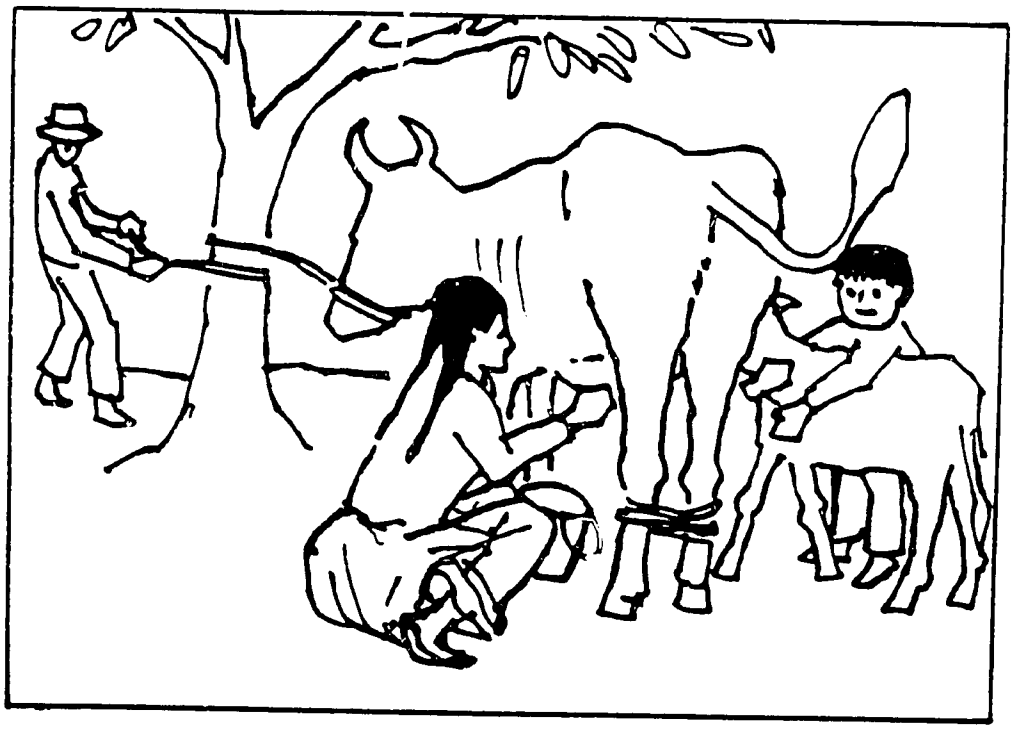
If present at the birth of the calf, the owner should make sure the membrane of the fetal sack has broken so that the newborn does not drown inside, nor is wounded by the mother in attempting to open the sack. After the mother bites off the placenta, the calf's stomach should be wrapped with a wide strip of cloth. This procedure is necessary to prevent possible infection of the placenta wound, sometimes caused by the mother's licking. In Puca Puca, calves born in the wild frequently suffer from placentas that are worm infested--a condition known as la gusanera that is particularly common in warm climates. The local cure for this infection is to apply a liquid disinfectant such as iodine or a liquid farmers call criolina. In Melga, a cow that has just given birth is covered with a thick blanket to keep the animal warm. The mother is also given an enriched diet of alfalfa, both before and after she gives birth to her calf. A final precaution--practiced in Melga--is to tie a head of garlic to the cow's tail, a remedy intended to prevent snakebites caused by serpents that are attracted by the smell of milk. A cow that has been bitten in the udder by a snake (while resting) will stop lactating from any wounded teat.

The calf will normally nurse for one year. But there are cases of calves --called khomis--which nurse as long as two years. Weaning usually occurs automatically when the cow becomes pregnant again, for after the fetus nears mid-term the cow's milk changes in quality, thickening and yellowing.

MILKING

In Puca Puca, cows are seldom milked while they are in the monte but only after they have been brought back to the farmhouse for post-natal supervision or during the off-cropping season (June to November). Such animals are difficult to milk because they are half-wild and very headstrong. First, the cow is separated from its calf from evening until milking time the following morning--a practice known as chiquiru. At the time of milking, the cow must be tied to a tree by its horns. Next its hind legs are tied to keep it from kicking. Once the mother is adequately secured, the calf is led in and allowed to suckle one teat until the milk begins to flow. After the milk flows the calf is pulled off the teat and the milker begins to milk with both hands. Presently the calf is allowed to suckle a second teat until the milk flows and then once more withdrawn so the milker can work. This process continues until all teats have been used. It is important to leave some milk in each mammary gland so that the calf will be able to nurse adequately after the milking is complete. The calf will be allowed to remain with its mother during the remainder of the day, then separated once more in the evening.

As described above, milking a half-wild cow in Puca Puca normally results in a yield of about three liters per animal. In part this is due to the need to leave some milk for the calf. However, the total milk yield is low to begin with because criollo cows are not specialized dairy breeds nor do they feed on improved pasture. It should also be noted that the milking of a criollo cow requires at least two participants and often three: one to do the milking, one to hold the pail (typically an aluminum pot or blastic bucket), and a third to hold the calf.



Milking a Criollo Cow

In contrast, milk cows in Melga are usually improved breeds that are fed abundantly and milked twice a day. Seldom do milk yields fall below 6-8 liters, while older animals that have had at least three calves may produce as high as 20-25 liters.

PASTURE, FEEDING, AND SHELTER

Beginning in the month of November, cattle herds in Puca Puca (with the exception of oxen) are driven 10-30 kilometers to grazing areas along the Mizque river. These lands are characterized by mountainous terrain and low forest. Each family has its own preferred area for grazing its herd, but these are not fenced in; the animals are therefore free to wander as widely as they wish. A member of the owner's family may go to check on the herd every 1-2 weeks. Yet during the busiest part of the plowing and planting season (December-January) it is not uncommon for a herd to go unsupervised for an entire month.

To check on the herd, a family member (almost always male) takes a day's ration of food and travels by horseback, public transportation, or on foot to the distant grazing area. Upon his arrival he waits at the stream where the animals usually come to drink once or twice a day. If after a half-day's wait the herd has still not appeared, the visitor must begin to search inward from the stream. It is not unusual for a herd to remain unlocated for several days. In such cases the visitor will seek food and lodging among families he knows in the grazing area, and these local residents are also consulted about when they last saw the herd. Once the herd is located, the animals are counted. If one is lost, further searching is required. The owner checks the sky for vultures which might signal the location of a dead or wounded animal. In addition to the slaughter of newborns by mountain lions and foxes, the most common losses are the result of an animal breaking its leg or its neck from falling down a steep embankment. Upon locating the missing animal, if it is dead it will still be butchered to save the hide. If still alive, the animal will be butchered for its meat as well. In this case it may be necessary for the owner to return home and come back with several burros for transporting the meat and hide.

If the herd is intact, the visitor may still have to separate a cow which is ready to give birth, or a newborn and its mother (for reasons of safety and milking), or bring home a calf or adult animal which is badly in need of health care.

Over two thirds of the cultivated land area in Puca Puca is planted to corn. After the ears have been picked, and a portion of the chala (corn stalk residues) has been cut down and stored in trees, the remaining stalks are now available for livestock forraging. Sometime during the month of June the owner brings his cattle herd back from the monte and turns the animals loose in the now-harvested corn fields. Each field is adequately fenced or walled with thornbushes along the boundaries so as to keep the animals from wandering. From these makeshift "pastures" the family will take its herd to water at the nearby Aiquile River at least once a day. The cattle will thus remain in the community for a period of 4-5 months, to be returned to the monte in November.

In Melga, cattle holdings consist primarily of oxen or cows. The care and feeding of oxen was described in the previous section. With regard to cows, these are raised in one of two locations. Improved breed milk cows are kept close to the farmhouse in the more protected lowland zones of the community; here they are allowed to graze at field boundaries or, when kept at the stable beside the farmhouse, fed some 4-5 helpings of green fodder or dry silage each day. The green fodder usually consists of green barley or oats, sometimes combined with alfalfa. Dry silage will include corn stalks and the residues of threshed grain crops. When served dry silage, the animal is watered four times a day; if served green fodder, only two waterings a day are necessary. The primary precaution in feeding cows is to avoid serving them forrage which is warm from heating in the sun, or forrage that is wet with morning dew. Farmers consider both these characteristics "death" for cattle.

Criollo breed cattle in Melga are usually kept in the highland zone known as Parina. These animals are grazed in fallow croplands and natural pastures, but always under the supervision of a shepherdess. Most of the young women who live in Parina are specialized pastoras (herders) who care for the animals of other families. For these herding services they are paid in cash or agricultural produce or even clothing. The cattle herds located in Parina are kept at night in simple corrals made with stone walls. Herds are pastured in Parina much for the same reason as cattle from Puca Puca are pastured in the monte: to create an investment that grows and reproduces itself, a savings account. If the cows are milked at all, the milk goes to the shepherdess.

DISEASES AND AILMENTS

In Puca Puca, cattle herds are usually treated for health problems after they have been brought back to the community for the June to November cropping off-season. At this time they are vaccinated against hoof and mouth disease, rabies, and brucellosis. Many families buy the vaccines in Aiquile and do the vaccinating themselves. Others make use of a Government agency, known as SENARB, which is located in [illegible]ile and sends out mobile vaccination teams to immunize local cattle [illegible]nst these three diseases.

The most common ailment in calves is the gusaner[illegible] [illegible]station) caused by infected umbilical wounds following bi[illegible] [illegible]reated with applications of an all-purpose disinfectant know[illegible] [illegible]na. A second common problem in all cattle is garapata (tick in[illegible]on), which is also treated with applications of criolina or baths with kerosine. In the colder climate of Melga there is an ailment known as chujchu, which has the same symptoms as malaria: high fevers and shaking. Chujchu is cured by a variety of remedies. One is to put the animal inside a warm stable and

make it drink strong chicha or grape brandy. Another is to collect a wild-growing chili pepper known as ulpica and burn it in a dish held near the animal's nose so that it is forced to breath the smoke. A third method is to bleed the animal by making a cut in the animal's tail and drawing out the "bad" blood. Finally, there is the occasional problem of hinchazón or bloat, usually caused by the animal eating warm or wet fodder. Some families cure this ailment by puncturing the hide of the animal to release the accumulated gases directly from the stomach. Other remedies include forcing the animal to sneeze violently, or running it around briskly.

MARKETING

Although the lifespan of a cow might reach 18 years, the animal will always be sold once it can no longer reproduce or somewhere around ten years. In Puca Puca, a cow will often be sold after having had only three calves, before the meat becomes too tough and acquires an insipid taste. In Melga the norm is to sell a cow after 6-8 calves. Some families determine the appropriate age for marketing a cow when its teeth deteriorate (wear down) to the point that it can no longer eat coarse straw and silage. The sale of a young cow of proven reproductive capability is regarded as a sure way of bringing bad luck upon the owner's family, particularly in Melga, for the act is seen as selling away the animal's progeny.

BURROS

HOLDINGS

In Puca Puca, ten out of 15 families surveyed raise burros. Every one of these families has at least two of these animals, while one household raises 14 burros. In Huayculí, five of 12 families surveyed kept a burro, all of them only one animal apiece. In Melga, out of 13 families surveyed there were found six families with combined holdings of seven burros. It is important to mention that in Huayculí and Melga only male burros are used. Puca Puca is the only community where the breeding of these animals occurs. It is reported that when Melga was still an hacienda, its owner raised many burros. However, in those days the breeding of the animals and the care of the newborns was conducted in a warm climate location outside the hacienda.

USES

Of course, the principal uses of the burro are for transport, and perhaps secondarily for threshing and manure. Therefore, the principle differences in the use of burros from one community to another have mostly to do with the different loads these animals carry and where they travel. In Puca Puca, burros are used to transport harvested produce from the fields to the farmhouse, manure from the livestock corral to potato planting sites, and loads of firewood from the community into the Aiquile market. Most residents use trucks and public buses to transport themselves and produce for sale into Aiquile, but they use burros to carry loads from the farmhouse to the highway. In this regard there exists a custom among local residents of lending burros to each other--without charge--between the community and the road. When a family's head-of-household is preparing for a trip to the highlands to barter corn or his labor services for potatoes and other products, it is customary--provi[illegible] he has no burro of his own--to rent one or more of these animals [illegible] hbor. For this service a charge of one day's labor is the [illegible] or each animal rented. However, the price is the same whether th[illegible] borrowed for one day or for an entire week.

In Huayculí, burros are used for two principal tr[illegible] eeds. The first is to carry clay for pottery, and straw or charcoal for the kiln, from the field to the farmhouse. The second transport use of burros is to carry finished pottery from the community into local markets (Cliza or Punata) or up to highland villages to barter for potatoes, oca, papaliza, habas, and other cold-climate crops. In Melga, the principal use of burros is to

carry the heavy loads of manure, fertilizer, and seed from the farmhouse to the crop planting sites, particularly those located in the distant highland location of Parina. Similarly, the burro's return trips are frequently made with harvested produce, firewood, or weeds and grasses gathered for foddering livestock. When not needed for hauling heavier cargo, women use the burro to transport cooking pots and utensils, food for the mid-day meal in the field, and tools--including the wooden plow or the rodillo (land leveling post).

BREEDING, GESTATION, AND POST-NATAL CARE

Burros breed in the countryside without any control or planning by their owners. The only caution to be taken during the gestation period is to avoid having females carry heavy loads during the advanced stage of their pregnancies, for such stress can cause abortion. The newborn is taken from its mother for the first few hours following birth. Its lactation period usually lasts 7-9 months, but weaning will occur automatically after the mother becomes pregnant again at around six months after breeding. The gestation period is considered to be 9-10 months, with male fetuses delaying longer than females. The newborn begins to eat pasture at about two months of age. Some owners mix alfalfa with dry silage to provide an enriched diet for the young burro.

PASTURE, FEEDING, AND CARE

Burros are excellent browsing animals and eat a wide variety of natural or prepared fodder. In Puca Puca, burros are allowed to wander about the community at their whim. They feed on the pods of the algarrobo (carob tree), on wild bushes known as chakatia and qini, and on most grass and crop residues. In Huayculí, burro owners feed their animals corn stalks, wheat, barley, or oat straw, and alfalfa taken from an irrigated plot they may rent outside the community. In Melga, burros are allowed to graze with other livestock along field boundaries, or they are pastured in fallow croplands. At the farmhouse they are fed silage from barley, wheat, oats, and corn, or potato stalks (aylinco). Because of the density of crop plots in Melga, at many different stages of growth, it is necessary to take precautions in the grazing of burros to prevent them from eating growing crops. This is done by tying the back feet of the animal together to restrict its movements, or simply staking the burro to a fixed grazing location. Melga is also the only community where burros are housed in stables, with a roof to protect from rain. The warmer and more arid climates of Huayculí and Puca Puca make the stabling of burros unnecessary.

DISEASES AND AILMENTS

The most common problems suffered by burros are constipation, bloat, cargo sores, and inflamation of the mouth and throat. Constipation is treated by forcing the animal to run around briskly. Bloat is treated the same way, and also by forcing the burro to drink kerosine. Cargo sores are known as matas, and they are caused by inadequate protection of the burro's back during long trips. To prevent such sores from developing in the first place, most burro owners use a thick cargo mat—called a caroma—made of old sacks and rags; for long trips a wooden cargo saddle will be placed on top of the caroma. Once a sore has developed, however, it will first be disinfected with creolina and then covered with chicken or truck grease. Another remedy is to cover the wound with a dry powder made from the Andrés Huaylla plant. As for mouth and throat inflamations, owners burn a dry maguey cactus in a dish and force the burro to breath in the smoke.

MARKETING

Families in Huaycalí buy their burros at the weekly fair in Cliza, while those of Melga go to the Punata market. In both cases the burros will have been brought in from outside the region, from hot climates such as Comarapa, Aiquile, and Pasorapa. If a farmer wishes to buy a burro at its market of origin, he may pay as little as 1,500 pesos (US$60) at 1981 prices, whereas one purchased at Cliza or Punata will cost almost twice as much. In purchasing a burro, the buyer's major precaution should be to accurately determine the animal's age. Burros have a lifespan of about 20 years, but after some ten years their teeth become too worn down to adequately chew dry and coarse forrage. The buyer, then, should always inspect the teeth of the burro before he discusses its price.

SHEEP

HOLDINGS

Sheep-raising is practically universal among the rural households who participated in the Traditional Practices Project in the Valleys region. Of the 40 families for whom livestock inventories were prepared, 37 raised sheep. The largest size of flocks was observed in Melga, where the average was 24 animals. Households in Puca Puca raised an average of 17 sheep apiece, while in Huayculí there were a dozen sheep per household . The flock size registered for Puca Puca is somewhat deceiving, however, because in that community goats are grazed jointly with sheep. When sheep and goat holdings are combined, the average climbs to 30 animals per household—the highest of the three communities.

USES

The importance of sheep-raising to subsistence households can not be underestimated. First, sheep are a source of emergency cash income, a kind of living savings account that can be readily liquidated to finance urgent expenditures required by the farm family. Second. sheep are normally sheared once a year for their wool, which is subsequently spun into yarn and woven into fabric for a wide variety of uses: blankets, ponchos, cargo sacks, sweaters, and flannel for skirts, pants, shirts, blouses, and other garments.

Third, sheep are a principal source of meat for the farm family—particularly for festival days and other celebrations. The slaughtering of a lamb or buck is practically obligatory for birthdays, All Saints Day, Carnival Week, Easter, and usually the patron saint's day of the community. Sheep are given as gifts to repay the godparents of a newly-married couple, or butchered to feed the guests at a funeral wake, or to provide a high-protein diet for new mothers following childbirth. Upon the completion of the roofing of a new house, it is customary to celebrate with the roasting of a lamb, wh using the animal's blood to stain the walls of the new dwelling—a r al called yawarchada—to scare off evil spirits.

Finally, sheep manure is an indispensable resource for soil improvement, and it is the preferred fertilizer for potatoes and other tuber crops. Collecting manure is so important for some households that they may actually go to the trouble of constructing temporary corrals to concentrate sheep manure during daytime pasture grazing. Even if sheep owners have no on-farm

need for this manure, they can easily sell it to other producers. In 1981 a truckload of sheep manure could be sold for no less than 2,000 pesos (US$80).

It bears mentioning that in the three communities studied, ewes are usually not milked (as is the case in the Altiplano region); farmers prefer to reserve sheep milk for the consumption of lambs only. In fact, during times of lean pasture, or when ewes turn dry and are no longer able to nurse their young, it is not uncommon for families with lactating goats to arrange for malnourished lambs to suckle them.

BREEDING, GESTATION, AND POST-NATAL CARE

Sheep breed by themselves in the field without any need for human intervention or supervision. Normally only one breed ram is required per flock. Ewes can be bred beginning at two years of age. The gestation period lasts about 5-6 months; but only one pregnancy occurs per year under normal circumstances, although two are technically possible. Most lambs are born in either of two seasons: (1) in late June, around the time of Saint John's Day (June 24th), at the start of the lean pasture season; or (2) around Christmas, near the beginning of the flush pasture season. Newborns arriving in the former period are called San Juan uña, while those in the latter period are called Navidad uña or k'omer uña meaning "children of green". The largest number of lambs appear to be born at the less-favorable time.

The lamb is usually born in the countryside. The shepherdess will then carry the newborn home as a precaution, because abandonment of their first-born lambs is always a danger among young ewes. The lamb will be kept inside the farmhouse for a few days--sometimes as long as two weeks--until it is strong enough to keep up with the rest of the flock. During this period the mother is given a special diet of alfalfa, corn residues, or enriched forage to stimulate its milk supply for the lamb. Sometimes the mother ewe dies in giving birth or becomes dry (jorra), thereby orphaning its young. In this case the lamb becomes a chita (literally, "spoiled kid") and becomes dependent on the shepherdess, following her around like a domesticated pet. In Puca Puca, chitas are often placed with mother goat[illegible] nursing. However, in other communities it often becomes necessary t[illegible] the orphan lamb because there is no convenient way to preven[illegible] becoming malnourished.

PASTURE, FEEDING, AND CARE

The pasturing of sheep and the intensity of their supervision varies considerably from one community to another. In Melga, only very small flocks can be grazed in the lowland areas of the community because pastureland is very limited. Crops in all different stages of production will always be present in the lowland (irrigated) zone, so sheep must be carefully grazed along field boundaries or amid crop residues following the harvest. However, the animals are usually hobbled (their hind legs tied together) or staked with a short length of rope so that they can be kept under strict control. In contrast, in the highland zone of the community there exists an abundance of natural pastureland which permits the grazing of large sheep flocks. Young women who reside in the area offer their services as shepherdesses. They watch the flocks of lowland residents in exchange for a share of the lambs, or in-kind payments such as clothing and agricultural produce. The shepherdess usually gets to keep the manure as well.

In Huayculí, sheep flocks are herded by shepherdesses as well as sheep dogs. These animals are suckled on ewe's milk as puppies and thereby acquire an instinctual affinity and loyalty to the sheep flock. The sheep are usually grazed at considerable distances from the community--in open range located further than an hour's travel from Huayculí. The task of the herder and her dog is to keep the flock bunched, for protection from predators. In addition to her cries of cuty, cuty (return, return), and the skilled herding movements of her sheep dog, the shepherdess controls the flock with rocks hurled from a sling. On these long, all-day pasturings, the shepherdess must take her own dry rations, or if she cooks hot food, her cooking utensils and produce. She must feed not only herself but also her dog. She also takes along spinning and knitting materials to entertain herself. In Huayculí the herding of sheep is often organized on the basis of ayni or exchange labor arrangements wherein two or more flocks are herded by a single shepherdess. She may do the herding for her neighbor, who then must reciprocate with an equivalent favor at a later date.

In Puca Puca the herding of sheep is extremely unsupervised. The housewife takes the animals from their corral at around 7-8 O'clock in the morning, drives them about one hundred yards away from the farmhouse to get the flock moving, and then lets them go on to their desired grazing location by themselves. The animals will ordinarily take themselves to water at midday. They usually return by themselves to the farmhouse around six P.M. Such unsupervised grazing only occurs during the flush pasture season (December-April). Otherwise, following the harvest, sheep along with other livestock are taken to graze on crop residues in the enclosed fields.

In none of the three communities are sheep corraled at night in a shelter with a roof. The corral itself is always located next to the farmhouse for reasons of security and convenience. In Puca Puca and Huayculí, sheep pens are usually constructed of algarrobo (carob) branches, and typically they are round in shape. In Melga, sheep corrals are built with stone walls, but not adobe bricks. It is argued that adobe walls are not correct because with rainfall the mud dissolves and mixes with the sheep manure, creating a "heavy", crusty fertilizer that is less manageable and less potent as well. When residents of Melga need to buy sheep manure, they search for farmers who keep their sheep penned in rock-walled corrals.

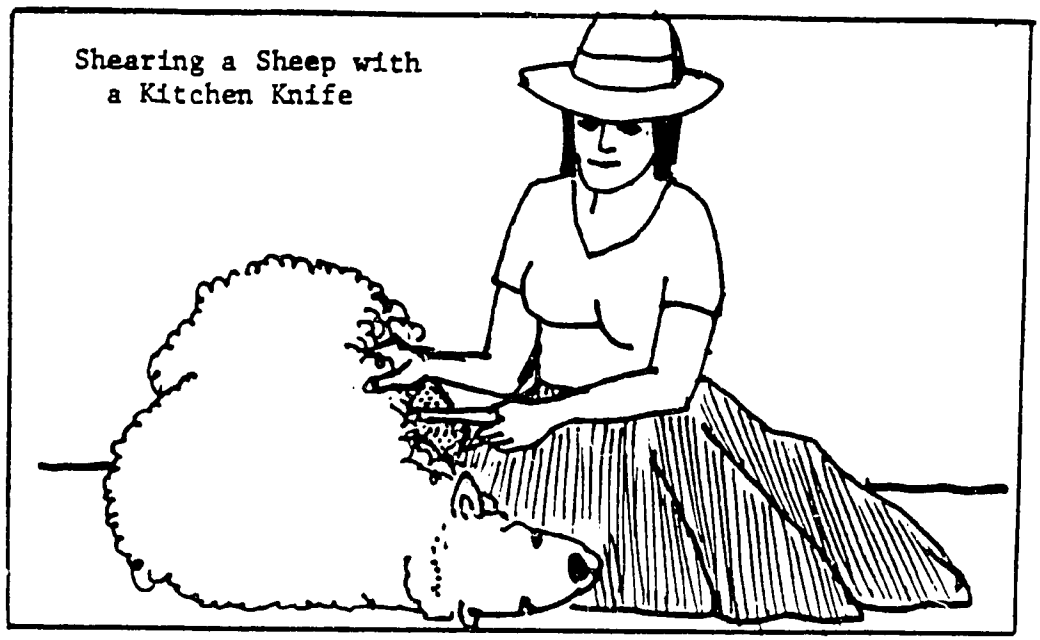
CASTRATION

Bucks are the first lambs to be eaten. But any buck that reaches six months of age and is not destined to be a breed ram will be castrated. The task is typically performed by the male head of household, often with the assistance of his wife in holding the animal steady. The best time to castrate bucks is on the day of a new moon. Once the testicles have been removed, the wound is treated with ground salt (to stop the bleeding) and ashes (used as a disinflamant). If the wound becomes infected it will subsequently be treated with creoline.

SHEARING

In all three communities sheep are sheared once a year. The task is known as rutuy, and sheep of both sexes are sheared. The shearing season is highly variable. Some households prefer to wait for a full moon before conducting rutuy. Since seldom more than 4-5 animals will be sheared on a given day, owners of large flocks may spread the task over two or more full moons. Although shearing usually occurs during the rainy season--because the wool tends to be cleaner at this time--one household might conduct the task in November while another may wait until January or February.

Most sheep are sheared with ordinary kitchen knives. A few families prefer the sharpened lids of sardine cans. During the shearing itself the cutting tool must be sharpened repeatedly. To prepare the animal [illegible] shearing it is first necessary to lay the sheep on its side and [illegible] [illegible]nt and back legs together. First the legs are sheared. Next, a st[illegible] [illegible]ross the animal's belly which extends from the neck to the an[illegible] [illegible] wool is cut away to the right or the left of this strip, slow[illegible] [illegible] the wool and maintaining a continuous piece. First one side o[illegible] [illegible]l is sheared (and peeled)--like removing a jacket--and then the o[illegible] If the skin of the animal is accidently cut, it is customary to treat the wound by rubbing it with a little manure. About 1-2 centimeters of wool should be left on the animal to protect it somewhat from the cold. The wool yield will depend on the size of the sheep, but the normal range is from a half-pound to 1.5 pounds of unwashed wool.



The cut wool is left to heat in the sun, which causes the lanoline in the wool to separate from the fibers. The sun-warmed wool is then taken to the river and washed, but without soap. Washing with soap will be conducted later, once the wool has been spun into yarn. The wet wool is beaten against a stone; this helps to soften the material and remove clumps of dirt or tangles. The wool is finally hung to dry in the branch of a tree or over a bush. Once dry, the wool is stored in a clean, dry location within the farmhouse. Little by little it will be spun into yarn--and almost daily pasttime of shepherdesses--and when enough skeins have been prepared they will be dyed for weaving. (For further details on the spinning and weaving of wool, see Chapter VII, Artesan Crafts).

MARKING

For families with larger sheep flocks it is necessary to mark their animals every one or two years. Known as k'illpida, the marking ritual is traditionally held on the Thursday of Carnival Week, or at Easter, or on Saint John's Day (June 24th), and it is celebrated as a party shared with relatives and friends. Preparations for the party begin at least a week in advance with the making of chicha (grain beer), the buying of alcohol, streamers, confetti, and the cooking of special foods. On the day of the event, the host goes house to house accompanied by a guitarist calling his guests to the k'illpida.

The marking is done by spreading a single ear of each animal across a block of wood and cutting one or more notches using a sharp knife. First, all unmarked animals are gathered in their corral. One at a time the guests take turns playing "the fox". He or she enters the corral stealthily, snatches an animal, and holds it steady while the ear-cutter completes the marking. Often the captured animal as well as its captor are both required to drink some chicha before the cutting can proceed. A third person collects the ear cuttings in a dish. When all animals have been marked, a burnt offering is made to the Earth Mother to invoke the fertility and health of the flock. The ear cuttings are then burried in a hole dug at the center of the corral and covered with a large stone. Normally the k'illpida is an all-day event, characterized by abundant hillarity, eating, drinking, and ending with general drunkenness among the participants.

DISEASES AND AILMENTS

In young lambs the most common problems are malnutrition and diarrhea. The latter ailment is caused by the eating of damp, green pasture, and the problem is most common among lambs born during the flush pasture season. Most shepherds do nothing about the ailment and the animal gradually cures itself. If the lamb's condition continues to deteriorate, the animal may be served a special porridge made of corn meal. In Puca Puca, malnourished and dehydrated lambs may be allowed to nurse twice a day with a lactating goat.

Among adult animals the principal problems are khoñalera, muyu muyu, intestinal parasites, ticks, bloat, and fractures. Khoñalera is an ailment characterized by a yellowish-white mucus that drains from the animal's nose; sometimes worms come out of the nostrils. In Puca Puca, khoñalera is treated by burning ají ulpica (a wild pepper), onion skins, and some old, dirty wool, then making the animal inhale the smoke.

Muyu muyu is characterized by dizziness and disorientation of the animal, which begins to run around in circles, or constantly falling down. Also known as "worms in the head", muyu muyu is considered incurable and almost always leads to the death of the animal.

Intestinal parasites generally go untreated. They [illegible]ted when the diseased animal fails to gain weight; confirmatio[illegible] [illegible]agnosis comes when the animal is butchered and the worms are four[illegible] [illegible] intestines, liver, or other internal organ.

Ticks and other external parasites are sometimes treated by rubbing the infected animal with ashes. Crioline is also used on occasion. In previous years the Bolivian Government sponsored a campaign for the construction of sheep dips. Although the baths were initially quite successful, most have now fallen into disuse because it is nearly impossible for farmers to obtain the necessary chemicals.

Regarding bloat, the recommended cure in Melga is for the shepherdess to urinate in her hat; the bloated sheep is then forced to drink the urine.

Fractures are treated by preparing a compress of medicinal herbs and applying it to the limb at the point of fracture. Two splints are added on either side of the fracture. The compress and the splints are then bound tightly in place with a long strip of cloth.

MARKETING

Sheep are sold en pie (live) or butchered. When sold live, 1-2 year-old bucks brought prices of 300-400 pesos (US$12-16) apiece in 1981. Some mañazos (intermediaries) come to the community to purchase the animals directly from their producers, but usually it is the latter who must take sheep into the nearest weekly market fair and sell them at the playa de ganado (see LIVESTOCK MARKETING). When sold butchered, mutton or lamb cost 50-80 pesos per pound (US$2-3.20) in 1981. The meat is normally sold fresh, but sometimes it will also be sold dried as charqui. By butchering the animal, the farm family has the option of consuming the intestines, internal organs, the head, hooves, blood, and hide. Sometimes merchants or traveling salesmen come to the community and barter factory-made textiles or other goods for sheep. Sheep wool is seldom sold by the rural household because market prices are considered much too low. The wool of a single animal--known as a bellón--cost 30-50 pesos (US$1.20-2.00) in 1981. In mid-1982 an arroba (25 pounds) of dirty wool brought only 600 pesos (US$24) in the market at Aiquile.

GOATS

HOLDINGS

Puca Puca is the only community where goats are raised. Out of 15 project participants, 12 had goat herds in 1980 and 13 raised goats in 1981. The smallest holding of goats consisted of only two of these animals while the largest herd contained 49 goats; the average holding per family was 15 goats. In mid-1981 the average value per goat was 376 pesos (US$15), and for the typical household goat holdings amounted to roughly eight percent of the combined value of all livestock holdings. Goats are corraled and pastured in the same herds as sheep. When the holdings of both animals are combined, the average herd size per family reached 32 animals in June 1981, equivalent to 19 percent of the combined value of the livestock inventory.

USES

Goats are raised mostly for their milk, which in turn is prepared into cheese for both family consumption and market sale. When consumed by the family, cheese is frequently used as a substitute for meat. It is also combined with vegetable salads and used in empanadas (pastries). Fresh goats milk is considered a special treat, sometimes mixed with chocolate or with boiled corn; it can also be sold by the bottle at the market in Aiquile.

Young male kids--known as lechones--are sold for their meat. Some buyers come to the community to acquire these animals live; otherwise they are usually slaughtered by the farm family, which cons[illegible]es the intestines and organ meats. Goats are also valued for their [illegible]re. It is estimated that an adult goat produces one carga (125 pound [illegible]re per year. Goat hides are valued as rugs and bed coverings [illegible] leather is also made into jackets and vests which provided [illegible] considerable protection from thorns and branches when they mus[illegible] tr[illegible] into the monte (wooded grazing lands).

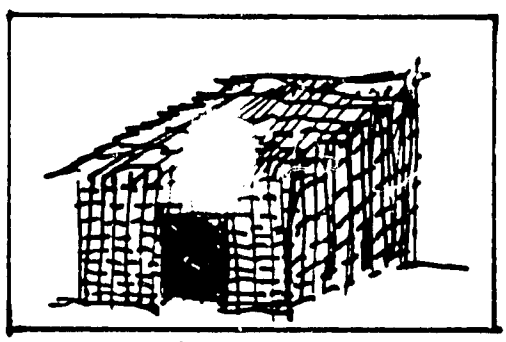
BREEDING, GESTATION, AND POST-NATAL CARE

Goats breed in the countryside without human supervision or intervention. The gestation period is 3-4 months in duration, with adult females producing young young once or twice a year. There breeding age for females is considered two years. Normally only one billy goat per herd is needed.

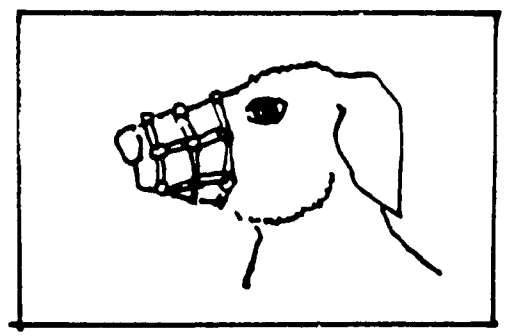
Like lambs, kids are generally born at the beginning of the flush pasture season (beginning in November-December) or at its end (June. The birth of two kids at a time is common, and sometimes even three occur. Newborns are customarily brought back from the countryside and kept at the farmhouse until they are old enough to keep up with the rest of the herd. At these times the kid is allowed to nurse copiously before the mother is sent out to pasture, sometimes given a fresh milk supplement at mid-day, and then allowed to nurse again with its mother at the end of the day. Young kids (and lambs) are often housed at one end of the corral in a roofed shelter known as the chiquero. This is to separate them from the mother goat so that they will not nurse during the evening. Most herds of goats (and sheep) are kept in the same corral at night. This structure is usually made of algarrobo branches and located beneath a shade tree to provide some protection for kids and lambs from direct sunlight.

MILKING

Milking of goats is usually limited to the flush pasture season, and thus to females who deliver their young beginning in November-December. The traditional milking season is considered to begin after Christmas. Although some families milk twice a day, the norm is a single milking. As mentioned previously, the kids are separated from their mothers after their evening nursing. First thing in the morning, the housewife takes a nuzzle made of knotted wool--known as a yucoma--and places it over the snout of the kid. The yucoma is first soaked in whey (left over from cheese-making the previous day). The muzzle is briefly removed to allow the kid to nurse briefly to get the milk flowing, then immediately restored during the milking. The housewife squats, traps one of the hind legs of the mother goat between her thighs, holds a gourd beneath the udder with her left hand, and pulls the teats with her right. Unless the udder is fairly dirty, no cleaning or wiping of the teats occurs before milking begins. About 1-2 cups of milk will be obtained from each goat, leaving enough for the kid to nurse afterwards.



Chiquero



Yucoma

PASTURE AND FEEDING

Goats in Puca Puca are raised under highly unsupervised conditions. They are taken out of their corral (along with the sheep) around mid-morning, driven a few hundred yards, and then allowed to continue on their way to a pasture site of their choosing. Some families send a sheep dog with the herd. The animals find their own forrage and take themselves to water at mid day. If the herd has not returned by six P.M., a member of the farm family will go out to find the animals and bring them home for the night. Goats are considered very easy animals to raise precisely because they can take such good care of themselves and because they eat a wide range of pasture and fodder, including dry algarrobo pods (in season) and the outside layers of cactus plants. The primary disadvantage of goats is that they can cause extensive damage to growing crops provided they find a way through or over the fence of an enclosed field. One of the most common and serious risks to agriculture in Puca Puca is known simply as daño or damage caused by unsupervised grazing livestock.

DISEASES

In general, goats are regarded as being fairly healthy animals in Puca Puca. It is common for an owner to assert: "My goats do not know how to get sick". Even so, there is always the ever-present danger of diarrhea in newborns, caused by eating green, damp pasture. Another problem is that of jamaku or lice. It is treated by rubbing the hide of the animal with ashes. A few families have been known to vaccinate their goats.

MARKETING

Many buyers come to Puca Puca itself to buy kids. In 1981 they sold for 150-200 pesos (US$6-8) live. Fresh goats milk could be sold in Aiquile for 5-8 pesos US$0.20-0.32, per liter bottle. Fresh cheese is sold in four-ounce units known as bollitos and in 1981 sold between 5-10 pesos (US$0.20-0.40) apiece. A detailed description of the making of goat cheese is found in Chapter IV, Food Preparation Practices.

PIGS

HOLDINGS

The raising of pigs is most generalized in Puca Puca, where ten out of 15 families kept these animals and holdings averaged five pigs per family. Even so--because of the relatively larger holdings of cattle, sheep, and goats--pigs are a minor livestock enterprise in Puca Puca, representing only four percent of the total value of the average livestock inventory. In Melga, about one out of every two households raise pigs, with an average of two animals per family valued at about six percent of total livestock holdings. In Huayculí, only one family in three has a pig (the average is one per household only) with a value amounting to about ten percent of the livestock inventory.

USES

The major use of pigs is for their meat. Pork is used in a variety of special dishes in the Valleys region including fritanga (roast), fricasé (a spicy meat soup), chorizo (sausage), morcilla (blood sausage), chicharón (fried pork rind), and others. An almost equally important byproduct of pigs is their lard. A medium-sized (6-8 month old) pig will yield some 3-4 arrobas (75-100 pounds) of lard, enough to last the normal rural household for an entire year. The lard itself must be stored in a porcelain pot with a tight cover, and it is typically covered with a layer of ashes to discourage being spoiled by ants. Bile from the gall bladder of pigs is mixed with sugar to make a medicine used by rural households to cure a number of different ailments. Finally, pigs have a special ritual use. Since they are considered unholy animals, it is customary to beat pigs when a hailstorm is approaching so that their squeeling and screaching will scare away the threat.

Slaughtering a pig is a major event in the rural community. The activity often lasts f[illegible] two days--the first to scrape the hide, gut, drain, and dress the ani[illegible] the second to fry the meat and collect the lard. Such events are ra[illegible]y conducted by a single family alone; instead it is customary to celebrate the slaughtering with relatives and neighbors. For this reason the event is typically scheduled to coincide with a major festival--like All Souls Day, Carnaval Week, or a birthday. It is not unusual to find at least a dozen adults involved in the different tasks connected with the slaughter.

BREEDING, GESTATION, POST-NATAL CARE

There is no particular breeding season for pigs. When the sow enters into heat her owners usually approach a neighbor who owns a boar and asks him to lend them the animal for a day. Payment for this service is typically made by giving a piglet from the future litter. The gestation period normally lasts 5-6 months. Just before giving birth, the sow will prepare a nest or bed known as the thapa constructed out of straw, pieces of cloth, or other soft materials available inside the pen. The sow will give birth to 2-4 piglets for her first litter, and for subsequent births the number of newborns will increase to about ten. Immediately after birth it is customary to remove the piglets from their mother and placed inside the farmhouse. This is done to reduce the risks of the sow squashing her young during the night. During the morning and afternoon the newborns are allowed to nurse. Both during the period of advanced gestation as well as for several weeks following the birth, the sow should be given special food rations containing grain, tubers, and perhaps rice bran or corn meal. The piglets will only consume maternal milk for the first 2-4 weeks, but thereafter they can be slowly weaned with servings of weeds or ground grain.

PASTURING, FEEDING, AND SHELTER

Pigs can be raised in corrals only, or pastured, or a combination of both. Some households review each litter to determine which are the best candidates for intensive fattening and keep these animals permanently corraled. In open pasture pigs can be herded with sheep, goats, and cattle, but it is best to keep them staked or hobbled to reduce the risks of damaging growing crops. In the specific case of Puca Puca, it is customary to construct triangular frames (three sticks tied together) which are attached to the neck of the pig to keep it from passing under or through fences which surround crop lots.

Pigs raised in the corral are mostly fed kitchen scraps, garbage, and water in which food has been cooked. Potato skins, onion skins, pea pods, broadbean pods, rotten or otherwise damaged produce, sediment from the preparation of chicha, and assorted grasses and weeds constitute the principal ingredidients for the diet of corraled pigs. In Puc[illegible] other major ingredient are algarrobo (carob) pods. Providing s[illegible] e feedings will help to fatten the animals more quickly. Thre[illegible] eedings per day are the norm, and a five-month period of intens[illegible] fattening is considered advisable prior to slaughtering.

Pigs allowed to forrage for themselves or grazed with other livestock are normally given two feedings a day, in the morning (before leaving the corral) and in the evening (when they return). During the day they will dig up the roots of grasses. In Melga, following the harvesting of a potato plot, pigs will be turned loose to root around in the field looking for tubers which may have been missed by the harvesters.

Pigs are normally kept in a corral constructed near the farmhouse. In Melga, corrals are built with adobe blocks or rocks; in Puca Puca and Huayculí corral walls are made with sticks. Pig pens built with sticks have the advantage that wind can pass more easily through the corral to carry off objectionable odors. Because of the colder climate in Melga, greater exposure to wind is a disadvantage. Some families construct a roof at one corner of the corral to provide limited protection from rain and shade from the sun.

DISEASES AND AILMENTS

The principal health risks to pigs are trichinosis, rabies, and suchera. Trichinosis, also known as ch'ia, is regarded as a major threat to public health and is severely sanctioned by the authorities. Pigs found to be diseased must be buried or burned, and the owner trying to sell such a pig will be charged a fine in excess of the animal's market value. Because of these considerations, some rural households simply refrain from raising pigs altogether. Others prefer to buy piglets with a good health certification rather than attempt to breed their own. The disease is characterized by the outbreak of blisters over the body of the pig, and when the disease is still in an early stage these blisters can be found underneath the tongue. Checking the tongue is the first thing livestock intermediaries do when buying a live pig.

Rabies is another disease that requires the destruction of the pig, but in this case the animal's owner will slaughter it and render the carcass for lard before disposal for burial. Suchera (also known as reneguera) is an ailment characterized by rapid weight loss, general weakening and dragging of the hind legs. It too has no cure, but in most cases the animal can be butchered for its meat and lard, or sold as soon as possible. In general, the typical pig raiser in Melga, Puca Puca, or Huayculí does not invest in vaccinations for these animals, nor conduct routine chemical sanitation of the pig pen.

MARKETING

Most pigs are raised for market sale in Puca Puca, whereas in the other communities they are reserved mostly for home consumption. Livestock intermediaries often buy pigs in Puca Puca itself; otherwise they can be sold at the c[illegible] plaza of the Aiquile Sunday market. Depending on the age of the an[illegible], the price will vary anywhere from about US$6-8 apiece for a piglet or sara qotitu, all the way up to about US$90-100 for a fully fattened pig or cebado. Variations of price inbetween these extremes are determined by the animal's weight, size, and amount of fat.

CHICKENS

HOLDINGS

Chicken-raising is a minor livestock enterprise in all three communities because rarely do holdings represent more than 2-3 percent of the total value of a family's entire livestock inventory. In Puca Puca all 15 families surveyed raised chickens, with the average flock size being a dozen birds. In Melga, 12 of 13 families raised chickens with average flocks of ten birds apiece. In Huayculí, only 7 of 12 households reported chickens --with an average of seven birds per family--yet additional holdings of pigeons serve to expand the total poultry supply. Chickens in Puca Puca and Huayculí are acquired through natural breeding and incubation since the climate in these locations is warm and dry. However, in the colder climate of Melga, chicks are purchased--usually from the same poultry farms where local residents buy their supplies of chicken manure.

USES

Chickens are raised for their meat, eggs, and occassionally for use in cures by traditional healers. For the most part, eggs are sold in local markets to generate a small but fairly steady source of cash income; rarely are eggs consumed by the farm family. As documented elsewhere (see Chapter IV), eggs are used in an average of only two meals per month in Huayculí, three meals per month in Puca Puca, and five meals per month in Melga. In contrast, chickens are mostly consumed for their meat by the farm household. Poultry, in fact, constitutes the single most frequent source of meat consumed by rural families. Chickens are cooked as a special meal, usually when the household has received a guest or other visitor. Poultry is cheaper and easier to replace than all other meat sources in the livestock inventory, with the possible exception [illegible] sea pigs. Yet in order to meet a small but urgent cash need, farm [illegible] will take one or several chickens to sell at a weekly market. [illegible] poultry within the community are also common.

Eggs are not always consumed as food. When a member of the household has a fever, it is customary to prepare plasters made from egg whites and sugar. Similarly, not all chickens are used to eat. Those with pure black feathers, along with others with abnormal feather arrangements--called <u>cuty wallpas</u>--are used by healers to dispell curses and treat other ailments of psychological origin.

BREEDING, INCUBATION, AND HATCHING

One rooster is required for a flock of 8-10 hens, but the bird must be replaced after about ten years. The hens usually lay about ten eggs over a two week period. If these are not incubated, the hen will again be ready for breeding. The first one or two sets of eggs laid by a young hen should not be left for incubation because they are considered too weak to result in hatching. Furthermore, most families attempt to limit the number of eggs incubated by one hen to about eight. During incubation most hens leave the nest no less frequently than once a day; some remain nesting for three days at a time. During this period it is necessary to make abundant rations of grain available to the hen.

When the hatching begins the only major precaution is to make sure the hen does not abandon her nest prematurely before all or most of the eggs have hatched. The chicks should be fed ground corn--known as thiqui--3-4 times a day until they can eat hard grain. It is also necessary to protect the chicks from rain, and to shelter them against hail. If a chick should get wet, the customary procedure is to wrap the small bird in a piece of cloth and then place it inside a woman's blouse where it will dry from the warmth of the breasts. After about two months of at least partial supervision and special rations, young chickens are able to fend for themselves.

FEEDING AND FORRAGING

Normally chickens are not raised in a coop or pen, although they may be housed in a shelter at night. Instead they are allowed to run about the farmhouse. A flock of eight chickens will need about a half a pound of shelled corn per day. The kernals can be stripped from the cob directly and scattered on the ground, a task that is done usually once a day either in the morning or the afternoon. Meanwhile they forrage for themselves searching for worms, grain seeds, insects, and kitchen scraps. If there is not a pond located near the farmhouse, a trough or other water source must be provided. When not served to the pigs, the skimmings and residues left over from the making of chicha constitute an excellent food for poultry--especially the chicks.

SHELTER

In Puca Puca, most chicken flocks sleep in the trees. For this purpose sticks may be placed in the crotch of branches to create more secure perching areas. Tree shelter is also customary in Puca Puca. In both instances nesting locations are quite variable and the choice is pretty much left up to the hen. Some families provide straw and other nest construction materials once the hen has chosen a consistent place for her nest. In Melga the colder climate requires the construction of chicken coops which provide protection from inclement weather; protection from foxes and other predators is also a factor. The coop or gallinero is normally constructed with a

base of rocks, adobe walls, and a roof of woven eucalyptus branches covered with mud or adobe roof tiles. Each night the chickens are closed safely inside the structure by placing one or more heavy adobe bricks to cover the entrance.

DISEASES

There are two major scourges of poultry. The first is simply known as the peste (plague) and is capable of destroying an entire flock in a single day. Most rural families are ignorant of its causes as well as how to cure the epidemic. It is simply considered bad luck: sometimes it strikes, other times it does not--just another risk to be faced. The other scourge is known as moquillo or congestion. Some poultry raisers in Melga cure this ailment by purchasing terramyacin tablets from a farmacy, with one tablet good for two hens. Others make the ailing birds drink a mixture of lemon juice and oil, and still others use garlic. A final novel remedy is to pluck a feather from the bird and get it down the chicken's throat. Nobody knows why, but the remedy seems to work.

There are minor ailments with poultry as well. These include ithas or external parasites which are particularly prevalent among chicks. Another problem is diarrhea. Hawks, foxes, and other predators are common problems for poultry raisers.

MARKETING

After six months, chickens reach marketable age and are sold or eaten about that time. The hens, of course, are kept for laying. In 1981, 2.5 and 3 pound chickens sold for 80-100 pesos (US$3.20-4.00) in weekly markets near Melga and Puca Puca. Eggs sold for two pesos apiece (US$0.08) at that time.

DUCKS

HOLDINGS

The raising of ducks requires a pond or other (semi-permanent) water source where these birds can swim. For this reason their production is considerably less generalized than chickens. No ducks are raised in Huayculí, only four families raise them in Puca Puca, and seven families in Melga. In the case of Melga the average flock of ducks reached 11 per household in 1981; average holdings per family were almost double in Puca Puca, ranging from 18 to 22 birds. In no case does the value of duck holdings reach two percent of the total worth of the livestock inventory.

USES

Ducks are principally raised for home consumption. In part this is because market prices for ducks are almost on a par with chickens, even though the latter are significantly smaller in weight and size. Like chickens, ducks are eaten on very special occasions---birthdays, weddings, major holidays, and visits by persons from outside the community.

Duck eggs are not consumed. However, eggs which fail to hatch--known as hueros or lok'os--are saved in a special place as ammunition to scare away hail storms. The eggs, which are blackened and rotted, are placed one at a time in a sling and hurled against the approaching storm clouds. This defense is combined with angry shouting exhorting the hail to move elsewhere.

INCUBATION AND HATCHING

Female ducks lay eggs all year round. In a single laying period a hen may lay 20-25 eggs. The laying age begins after one year. Initially, hens tend to lay their eggs somewhat indiscriminately, but eventually they select a preferred location and build a nest. The nest itself is mostly constructed from sticks, straw, and the hen's own feathers. Two or three laying periods must pass before the hen is permitted to incubate her eggs. Some 15-20 eggs can be incubated at a time, of which about two-thirds will eventually hatch. The incubation period usually lasts about five weeks. During nesting the hen often will not leave the nest for 2-3 days at a time. When she does leave to eat and drink it is important that she have access to high quality rations--corn, wheat, or quinua grain--and plenty of water. The major pre-

cautions to be taken by the owners is to make sure the mother's nesting location is safe from predators, that she is free of unnecessary disturbances, and that she does not leave her nest prematurely once hatching has begun.

Following hatching, the ducklings should be taken to water as soon as possible before their feet dry out. For the first few weeks the ducklings should be fed with ground corn or other grain moistened with water (known as thiqui), the same feed that is given to chicks. Sediment residues from the making of chicha are also good to serve ducklings. The grain can be ground with progressively coarse texture until after a month's time the young birds are able to eat unmilled grain and are able to forrage for themselves. Care must be taken to protect the ducklings from rain and cold during the day, and from predators at night. During inclement weather, it is customary to keep ducklings inside the farmhouse, particularly in warm areas of the kitchen.

FEEDING AND FORRAGING

A pond is vital for duck raising. It is here where the ducks do much of their forraging for insects, worms, larvas, and other food. In Puca Puca some ponds are shared by several families who in turn combine their duck flocks. In addition to what they find during forraging, ducks should be fed twice a day--in the morning and afternoon. In addition to dry grain, they can be fed kitchen scraps; a particular favorite is leftover boiled corn (mote) or broadbeans that have turned acidic. Ducks usually eat considerably more than chickens. They forrage in groups, always following the drake (known as the zorro). In Puca Puca most holding ponds dry up by September, so it is necessary to construct a provisional water tank or virque with which to sprinkle the birds' feathers and soak their feet on a daily basis.

HOUSING

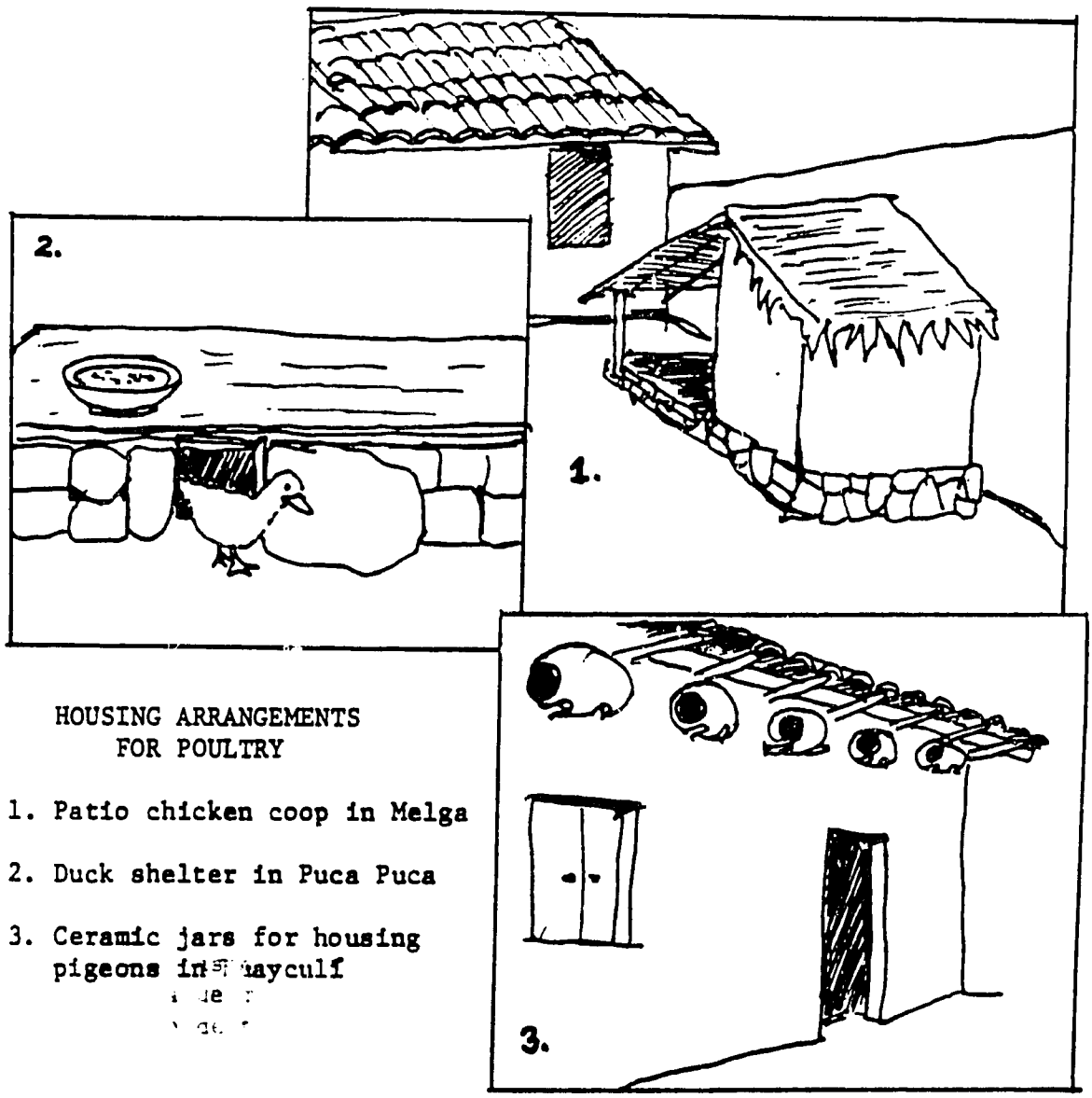
Housing arrangements for ducks are highly variable. Some ducks sleep in side livestock corrals in the open air. Others join [illegible]ckens in tree roosts. Still others are housed in chicken coops a[illegible] other poultry. It is noteworthy that ducks sleep with their heads [illegible]der their wings, and thus they appear to be decapitated.

DISEASES

Aside from predators and cold weather, the biggest danger to ducks comes from a plague known as the "bad wind" or sajra waira. As with a similar plague among chickens, sajra waira can wipe out an entire duck flock in the space of a day.

MARKETING

As stated previously, ducks are seldom marketed. In 1981 the market price for a live adult duck ranged from 80 to 120 pesos (US$3.20-4.80) in weekly markets near Puca Puca.



HOUSING ARRANGEMENTS
FOR POULTRY

1. Patio chicken coop in Melga
2. Duck shelter in Puca Puca
3. Ceramic jars for housing pigeons in Mayculf

PIGEONS

HOLDINGS

Of the three communities studied in the Valleys region, pigeon raising was only observed in Huayculí. Here five families out of 12 raised these birds. The average holdings were eight pigeons per family.

USES

Pigeons are raised mostly for their meat. The bird is preferably eaten fairly young--in the most tender pichón stage--beginning about three weeks after birth. Whether roasted or fried, pigeon is a very popular dish in the Valleys region, particularly in the Punata area near Huayculí.

BREEDING AND INCUBATION

Females are able to breed after their first month of life. Pigeons are seasonal breeders. They bear their young only in the dry season (from April to October), then rest during the rainy season (November to March). But during the 6-7 month breeding season, the female can produce an equal number of broods. Normally, two eggs are layed and incubated at a time to yield one male and one female. The incubation period lasts about two weeks, and within one week after hatching the mother pigeon is ready to start a new brood. The pair of newborns, one of each sex, will instinctively remain inseparable until death. If only one egg of the pair manages to hatch, the owners will eat the bird. Otherwise, pigeons are always marketed two at a time, never individually.

An interesting aspect of the incubation period is that both parents share the brooding responsibility. The female will brood without leaving the nest from, say 3 P.M. to 10 A.M. the following day; [illegible] will take over from 10 A.M. to 3 P.M. In this way the eggs ar[illegible]pt in a state of continuous warmth. Feeding of newborns is [illegible] shared responsibility. Both male and female pigeons beak-feed [illegible]g until they are old enough to feed themselves, or when they are [illegible]ly and leave the nest.

FEEDING AND HOUSING

Pigeons are only fed dry grain--preferably wheat. They do not eat greens or kitchen scraps as do chickens and ducks. Also, they require a source of drinking water which must be changed daily. One of the most common ways to house pigeons is to provide them with ceramic jars inside of which they can build their nests. Such jars are usually hung under the eaves of the farmhouse. Each pair of pigeons (and their brood) know their own nest and will always return to it. Between one family of pigeons and the next to occupy the same ceramic shelter, it is usually necessary for the owners to conduct a complete cleaning of the vessel.

DISEASES

Ailments among pigeons are fairly rare. As some owners will say: "My pigeons do not know how to get sick". The principal problem with these birds appears to be that of external parasites—fleas in particular—which mostly infest the newborns. Several pigeon owners say they have used DDT and other chemicals to dust their flea-infested birds, but with mixed results since the treatment often kills both parasites and their hosts.

MARKETING

Pigeons are always sold in pairs, never one bird at a time. In 1981 the price for a pair of pigeons (pichónes) was about 60 to 70 pesos (US$2.40 -2.80) in the Punata market.

GUINEA PIGS (CUYES)

HOLDINGS

Guinea pigs are only raised in Melga and Huayculí, not Puca Puca. In Melga, seven out of 13 families raised these animals with an average holding of 20 cuyes apiece. In Huayculí, four out of 12 families raised guinea pigs with an average of nine each.

USES

Like chickens, guinea pigs are a primary meat source for the rural family. They allow the housewife to prepare a special meal without having to sacrifice a larger and far more valuable animal such as a sheep or pig. Guinea pig is usually prepared roasted or fried for a "dry" meal--served with potatoes and noodles--known as shanka.

BREEDING

The female guinea pig is ready to breed at the age of three months. Thereafter she can produce one litter about every three months. Her first litters will yield 2-3 pups while subsequent births will yield 4-6 newborns. Only one male is required for about ten females. For this reason, most male offspring are destined for consumption within three months of age whereas females will be saved for reproduction of the flock.

FEEDING AND HOUSING

Guinea pigs eat all kinds of green fodder and vegetables. They are mostly fed handfuls of alfalfa, green corn husks, potato skins, pods of peas and broadbeans, onion stems, and kitchen scraps in general. The animals should be fed twice a day. During the rainy (or "green") sea[illegible] cuyes do not require a source of drinking water. However, in the d[illegible] it is necessary to place a dish of water inside their shelter.

Cuyes can be sheltered in a variety of structures, but the most important consideration is that their dwelling be warm and dry. In Huayculí, most families raise guinea pigs in a location outside the farmhouse. Sometimes the cuy house is independent, other times it may be part of a tiered structure which houses other minor livestock such as chickens and ducks. In Melga guinea pig raisers prefer to shelter these animals inside the farmhouse,

for example inside the kitchen or under a bed.

DISEASES

From time to time guinea pigs die inside their shelters from unknown causes, but generally they are considered to be extremely healthy animals. As with pigeons, a principal danger with cuyes is flea infestation --a problem easily solved by dusting with any of several chemical powders available in pharmacies.

MARKETING

As previously mentioned, cuyes are primarily raised for home consumption. However, the approximate market value of an adult cuy was about 35 pesos in 1981 (US$1.40). It its noteworthy that guinea pigs are not skinned prior to being cooked and eaten. Instead, the animal is first dipped in boiling water; then its hair is meticulously scraped off with a kitchen knife.

CHAPTER V.

FOOD PREPARATION PRACTICES

The preparation of food is the single most important activity of rural housewives. They cook not only to feed their families but hired laborers as well. They also prepare food and beverages for sale--cheese, bread, chicha, meat, and other items--to earn cash income with which to finance weekly purchases at the market.

The first section of this chapter is devoted to a description of the 3-4 different meals consumed daily by the farm family, their scheduling, and the most frequently prepared dishes for the average family in each of the three communities of Melga, Puca Puca, and Huayculí. The frequency of meat, eggs, and milk consumption is also covered. The cost of representative meals and weekly market purchases is included. Concluding this section is a summary of food preservation and storage practices, together with an inventory of the most common equipment or implements found in the rural kitchen.

The diet of farm families involves a wide variety of easy-to-prepare, economical, and highly starchy dishes. Recipies are presented which demonstrate the dominant cooking techniques for "wet" and "dry" meals as well as the great dependency on home-grown food. Also included are descriptions and recipies covering the preparation of special occasion meat dishes. The emphasis here is on organmeats and intestines because the meat itself is often sold rather than consumed by the rural household.

The chapter concludes with a description of how bread products, cheese, and chicha are made. All three require too much labo[illegible] conducted on a routine basis by rural housewives, but they do con[illegible] ome of the principal sources of cash income which women use to [illegible] family necessities at the weekly market.

DIETARY INFORMATION FOR THREE RURAL COMMUNITIES

Rural women are active participants in practically all farming activities. But if there is one task which can be considered the single most important responsibility of the female head-of-household, it is the preparation of meals.

For a full year (1981-1982) women from Melga, Puca Puca, and Huayculí kept diaries of their daily activities. Those participants unable to read and write were assisted in recording written entries by other family members --usually children attending primary school--who served as scribes. In these accounts the preparation of meals--mentioned three and four times a day--is reported with far greater frequency and detail than any other activity. Aside from simply mentioning that they cooked, these women also provided information on what specific dishes they prepared, often including the quantities and costs of ingredients used for each meal. Such data allow us to construct a fairly precise profile of what constitutes the normal diet for an average family in each community.

As with the reporting of any routine activity, unintentional omissions of information concerning meals--breakfasts in particular--did occur in the diaries precisely because they dealt with such ordinary and repetitive events. Thus, the following summaries of most commonly prepared meals in each community should be regarded as rough approximations of the relative importance and frequency of meals, not exact estimates.

TYPES OF MEALS AND THEIR FREQUENCY

DESAYUNO

As a general rule, the farm household eats four meals a day. The first of these is the desayuno (breakfast), taken between five and eight O'clock in the morning soon after the family awakens. Desayuno normally consists of a heavily sweetened hot beverage which may occasionally be combined with a piece of bread or some toasted grain. As such, the meal is really only a snack, something to allay hunger until the first heavy meal of the day has been cooked and served.

As shown in the community summaries below, the most popular breakfast beverage in all three communities is canela or cinnamon tea (mentioned 3,058 times), which is drunk twice as often as the next most popular beverage, coffee. Avena con leche (oatmeal with milk) is a significant breakfast food in Melga because of the existence of a mothers' club whose members receive powdered milk and oatmeal rations under a Government sponsored food assistance program. With regard to other breakfast items, sultana, cedrón, manzanilla, and torongíl are only a few of the many herb teas drunk by rural households, often more medicinal purposes. Api is a thick, sweet beverage made from cornmeal, ground carob beans, or chicha (corn beer) residues. Tostado de trigo is toasted wheat kernals. Other grains, particularly corn, peas, and broadbeans, are also toasted. When toasted grain is milled into flour it is called pito. Both pito and tostado are popular as snackfoods and generally substitute for bread in the rural diet.

ALMUERZO

The first heavy meal of the day is the almuerzo, which is literally translated as "lunch" but is more appropriately defined as "late breakfast". The almuerzo is served anytime between seven and ten O'clock A.M., or just prior to the departure of family laborers for their field tasks. If the work day begins earlier than usual, breakfast and almuerzo are sometimes combined into a single meal. Normally the almuerzo is prepared and served at the farmhouse. However, when non-family laborers are participating in field tasks beginning by 8 or 9 A.M., it is customary to serve them an almuerzo too, a meal usually served at the worksite.

The almuerzo is considered a "wet" meal. It usually consists of either a heavy soup (known as caldo or sopa) or a thick grain porridge (lagua). The most frequently consumed soups are made of rice, noodles, potatoes, chuño (dehydrated potatoes), peanuts, pumpkins, and a sweet tuber called papalisa. Porridges are made from corn, wheat, or quinua flours that have been coarsely ground. Lagua de janka quipa is made from corn that was toasted before grinding. Another type of wet dish is pejtu or stew, normally a special meal prepared with meat or a meat-substitute like cheese.

As will be documented presently, the average family [illegible] meat about 21 meals per month in Huayculí, 14 meals per month i[illegible] and eight in Puca Puca. Most of these references to meat consum[illegible]olve very limited quantities (half pound or less) added to so[illegible] or [illegible]guas to enhance the stock; seldom is meat the featured ingredient.

It is customary for every meal (except breakfast) to be accompanied by servings of boiled corn or broadbeans—called mote. A meal without mote is considered no meal at all. Indeed, when cheese is served with the mote, this can become the meal itself.

Of all meals cooked during the day, the almuerzo is of prime importance because its preparation may involve other meals as well. For example, if the rural housewife expects to work late in the field and will not have time to prepare supper, she will cook double quantities of almuerzo so that this food can be eaten for supper as well. Similarly, while preparing the almuerzo, the housewife will simultaneously be preparing the boiled potatoes and spice sauce to be consumed at mid-day.

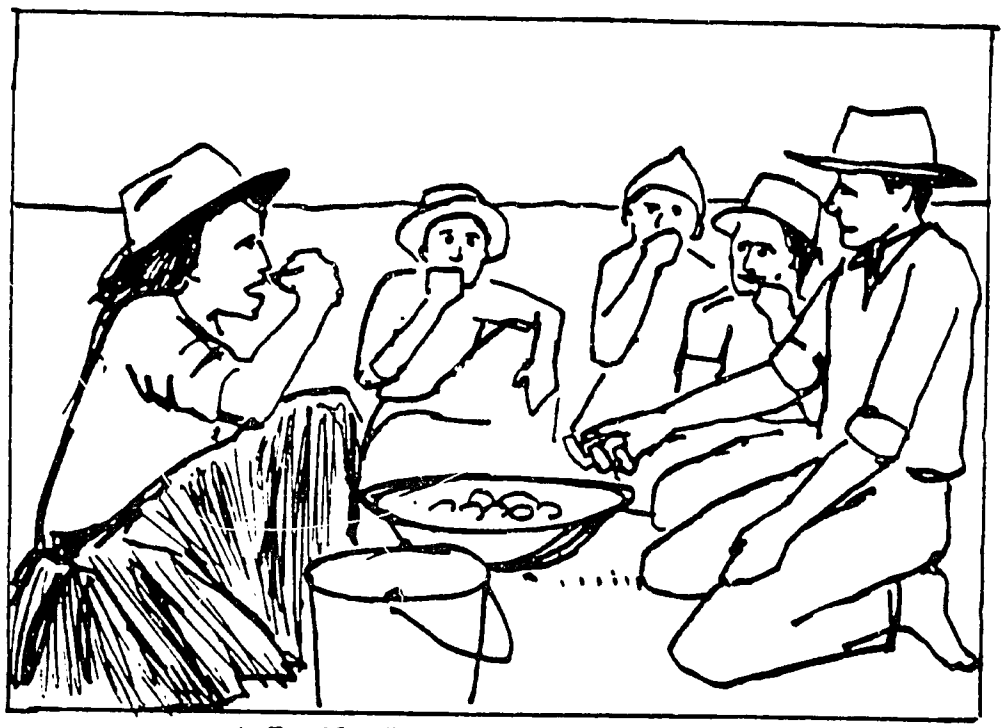
SAMAY OR MERIENDA

The third meal of the day is called the samay or merienda. These words translate as "rest" or "snack", but a more precise definition is "mid-day meal". In some cases the samay turns out to be the heaviest meal of all; when non-family laborers are participating the samay can become the day's most elegant meal. It is generally eaten at the work site anytime between noon and three O'clock in the afternoon. Most frequently the meal is prepared at the farmhouse and subsequently transported to the work site by the female head-of-household. Nonetheless, reheating or actually cooking the meal at the work site is common, particularly when hired laborers or guests will share the meal. The hour of the samay is quite variable, but it generally is served about five hours after the almuerzo.

The samay is considered a "dry" meal. It is almost always built around boiled potatoes--known as papa huayku--which are served with some kind of spicy sauce for dipping (called llajhua) made from ground tomatoes and hot peppers (ají, locoto, etc.). Invariably, the samay--like the almuerzo--is accompanied by mote. Another principal samay food is chake, a dish of boiled wheat which is puffed and dry, thus serving as a substitute for rice or noodles; chake is reported to be much more filling than the products it replaces. As shown in the community summaries, chake and papa huayku are the third and fourth most commonly-consumed meals, following close behind rice soup and noodle soup. When the samay must be a special meal to feed non-family laborers, one of the popular dishes is phuti de chuño (boiled chuño with egg and peanut sauce). Another favorite is cheese with mote. Finally, the truly special samay will include charke (dried meat).

As a dry meal the samay is eaten with the fingers. Individual plates or eating utensils are seldom used. All participants in the meal are expected to share from a common bowl. The llajhua sauce will be served in a single bowl or plastic bag. The beverage accompanying the meal (water or chicha) will be carried in a 10 liter plastic tank; everybody will drink out of

a single gourd. The logistics of serving the samay are simplified to the maximum extent possible. This reduces the weight of the meal load--which must often be carried several kilometers--and minimizes the clean-up chores once the meal has been completed.



A Family Eating the Samay

CENA

The final meal of the day is the cena or supper. It is normally prepared and consumed at the farmhouse between six and eight O'clock in the evening after all family members have returned from their field labors. There are few dishes prepared exclusively for the cena, because more often than not this meal will include leftovers from previous meals. It can be "wet" or "dry". It can include sopas and caldos, chakes and [illegible] The cena may consist of fried grain dishes--like arroz graneado [illegible] de trigo--or it may contain potatoes, chuño, or noodles cooked in [illegible] or stew. If the samay was eaten late, the cena may consist of little [illegible] than a hot beverage and bread--a snack like breakfast.

MOST COMMON MEALS OF MELGA

Description of Meals	Average Monthly Frequency	Total Families	Total Annual Consump.
BREAKFAST			
1. Canela	11	9	1,261
2. Café	7	10	866
3. Leche con avena	3	5	211
4. Cocoa	2	4	114
5. Sultana	2	4	94
6. Arroz con leche	2	3	85
7. Cedrón	2	3	64
8. Manzanilla	2	1	25
9. Torongíl	2	1	22
10. Other herb teas	-	-	29
ALMUERZO, SAMAY, CENA			
1. Caldo de arroz	10	10	1,200
2. Caldo de fideo	9	10	1,015
3. Chaka de trigo	6	10	672
4. Papa huayku	6	10	572
5. Phuti de chuño, papalisa	5	10	566
6. Caldo de maní	5	6	354
7. Chake de maíz	5	6	347
8. Chake de quinua	3	8	325
9. Arroz graneado	5	5	305
10. Lagua de avena	5	5	301
11. Papas con arroz	6	4	271
12. Caldo de chuño	3	7	262
13. Chuño con papas	6	3	217
14. Caldo de papalisa	5*	7	200
15. Lagua de janka quipa	4	8	195
16. Comida de calabaza	4*	8	193
17. Carne [illegible]do	4	4	189
18. Lagua [illegible] maíz	3	4	125
19. Caldo [illegible] papa	1	5	89
20. Phiris de maíz, trigo, quinua	2	4	74

SOURCE: Daily diaries kept by ten households from July 1981 to June 1982

* Seasonal food, available only six months per year

MOST COMMON MEALS OF PUCA PUCA

Description of Meals	Average Monthly Frequency	Total Families	Total Annual Consump.
BREAKFAST*			
1. Canela	5	11	601
2. Avena con leche	5	2	118
3. Café	1	4	67
4. Cedrón	-	3	16
5. Api de maíz	-	4	15
6. Bunuelos	-	3	13
ALMUERZO, SAMAY, CENA			
1. Lagua de maíz	9	11	1,142
2. Papa huayku	7	11	931
3. Chake de trigo	5	11	655
4. Caldo de arroz	5	11	644
5. Chake de maíz	5	9	545
6. Lagua de avena	6	6	415
7. Caldo de fideo	3	10	394
8. Pejtu de papa	3	10	391
9. Comida de calabaza**	5	11	352
10. Caldo de papa con chuño	3	8	335
11. Lagua de janka quipa	2	10	299
12. Phiris de maíz, trigo, quinua	2	11	275
13. Pejtu de triguillo	4	5	224
14. Chake de quinua	2	8	201
15. Caldo de maní	2	7	162
16. Thako lagua	1	7	98
17. Pejtu de zanahoria	2	3	77
18. Pejtu de maní	1	4	71
19. Pejtu de papalisa**	8	1	49
20. Pejtu de fideo	2		43

SOURCE: Daily diaries kept by eleven households from July 1981 to June 1982

* Breakfast data apparently incomplete. Among five families there were a total of 26 months without a single entry for breakfast.

** Seasonal food, available only six months per year

MOST COMMON MEALS OF HUAYCULI

Description of Meals	Average Monthly Frequency	Total Families	Total Annual Consump.
BREAKFAST			
1. Canela	10	10	1,196
2. Café	6	8	542
3. Té	3	8	276
4. Tostado de trigo	8	2	182
5. Sultana	2	4	93
6. Cocoa	1	3	36
7. Api	-	3	15
ALMUERZO, SAMAY, CENA			
1. Sopa de fideo	8	10	895
2. Chake de maíz, trigo, quinua	7	10	785
3. Merienda (unspecified)	6	10	726
4. Sopa de arroz	6	9	643
5. Papa huayku	5	10	543
6. Lagua de janka quipa	3	9	358
7. Lagua de harina de trigo, maíz	2	10	297
8. Pejtu de chuño y fideo	3	9	281
9. Sopa de chuño	3	8	275
10. Guiso de arroz	7	2	172
11. Caldo de papalisa*	2	7	166
12. Pejtu de papa con chuño	2	7	163
13. Caldo de papa	2	6	142
14. Phutis de chuño, fideo	1	9	142
15. Comida de calabaza*	3	7	106
16. Phiri de trigo, quinua, maíz	1	7	92
17. Caldo de maní	1	5	77
18. Asado de carne	3	2	62
19. Arroz graneado	2	2	50
20. Pejtu de papalisas*	1	2	16

SOURCE: Daily diaries kept by ten households from July 1981 to June 1982.

* Seasonal food, available only six months per year

CONSUMPTION OF MEAT, EGGS, MILK

MELGA: According to the diaries kept by women in Melga, the use of some form of meat as an ingredient in a meal averaged 14 times per month. Among ten families, the highest frequency of meat consumption was 25 meals per month, while the lowest was five meals per month. Eggs were consumed an average of five meals per month, with a range of two to 12 meals per month. Meals with milk or cheese were prepared an average of five times per month (range: two to ten meals). Assuming three heavy meals per day (excluding breakfast) or 90 per month, the typical family consumes meat once every six meals and eggs once every 18 meals. It would appear that milk is consumed almost exclusively for breakfast (with oatmeal) about once every six days.

PUCA PUCA: Despite the fact that residents of Puca Puca manage the largest livestock holdings, they eat less meat than families in Melga or Huayculí. The average frequency of meat consumption in Puca Puca is only eight times per month (lowest is three meals, highest is 14 meals). Among eleven families for whom records were kept, egg consumption averages only three meals per month (range is less than once per month to a high of four meals per month). The average family consumes milk only eight times per year. Thus, the typical household consumes meat only once every eleven meals (excluding breakfast), and eggs about once every 30 meals. It is a well-known fact that Puca Puca residents milk their goats and cows--particularly during the green pasture (rainy) season. However, judging from the diaries, very little of this milk is consumed fresh by the farm family. Instead, it is predominantly processed into cheese for market sale.

HUAYCULI: Contrary to what one might expect, Huayculí residents consume far more meat than families in Melga and Puca Puca--and this in spite of the fact that their livestock holdings are the smallest of the three communities. The average family in Huayculí consumes meat with 21 meals per month. The household with the lowest frequency of meat consumption consumed meat 11 times per month, the highest 35 times. However, this pattern is limited to meat only. Eggs are consumed with an average of only two meals per month (range: 0 to 8), and milk is consumed in an average of only five meals per year. Huayculí's significantly higher consumption of meat is possibly explained by the fact that its residents are potters who market their crafts throughout the year and therefore have access to a steadier flow of cash income with which to purchase meat.

COST OF MEALS

An analysis was made of 40 separate dishes for which cost estimates of their ingredients was found in diaries kept by women. For each dish the number of people it served--adults and minors--was also known, which allows us to estimate the average cost of each meal per person. The summarized cost data are presented in the following chart. The forty selected dishes have been divided into three broad categories: breakfast (five dishes), other meals without meat (29 dishes), and other meals with meat (six dishes).

The cost estimates are based on the full market value of all ingredients used to prepare the meal (i.e., the cost of the meal if all ingredients had been purchased at the nearest local market). However, in reality nearly all the meals contain ingredients that the household produces itself or has obtained through barter transactions without necessity of a cash outlay. It is precisely to minimize cash expenditures (thereby maximizing household self-dependence and subsistence capacity) that the diets of farm families in Melga, Puca Puca, and Huayculf are dominated by meals based on potatoes, corn, and wheat or other grains.

BREAKFAST: Of course, the most inexpensive meal of the day is breakfast. The dominant beverage drink is canela (cinnamon tea), which at 66 centavos per serving (US$ 0.03) is slightly less expensive than coffee. A breadroll or a buñuelo (fritter) roughly doubles the cost of the meal per person. On the average, a single portion of breakfast implies a total cost of about 1.18 pesos (US$0.05). Assuming 30 breakfasts per month, the monthly cost per person would reach 35 pesos (about US$1.42).

OTHER MEALS WITHOUT MEAT: The average cost of a serving of almuerzo, samay, or cena without meat is estimated at 3.81 pesos (US$0.15). The least expensive dishes are based on wheat (average 1.86 pesos per serving), boiled potatoes (2.13 pesos), and corn (2.66 pesos). Rice and noodles are normally purchased commodities and therefore contribute to dishes of medium expense (average 4.80 and 6.57 pesos respectively per serving). The addition of habas, chuño, or cheese to these less expensive ingredients will usually cause the cost per serving to at least double. Assuming 90 "other" meals per month, the monthly cost per person--if no meat dishes are eaten--would reach 343 pesos (US$13.72).

COST OF REPRESENTATIVE MEALS EATEN BY RURAL HOUSEHOLDS
(1981 PRICES)

Name of Meal	Av. No. Persons Served	Average Total Cost (pesos)	Cost Per Person Pesos	Cost Per Person US$
BREAKFAST				
1. Canela sin pan	6	4.00	0.66	0.03
2. Canela con pan	5	3.75	0.75	0.03
3. Café sin pan	6	4.50	0.75	0.03
4. Café con pan	6	10.33	1.72	0.07
5. Buñuelos	8	16.00	2.00	0.08
Average for breakfast			1.18	0.05
OTHER MEALS WITHOUT MEAT				
1. Sopa de arroz	5	13.22	2.64	0.11
2. Sopa de arroz con habas	8	43.00	5.38	0.22
3. Sopa de fideo	5	16.00	3.20	0.13
4. Chake de trigo	7	18.00	2.57	0.10
5. Lagua de trigo	8	14.00	1.75	0.07
6. Lagua de maíz	7	23.00	2.88	0.12
7. Lagua de janka quipa	5	17.50	3.50	0.14
8. Sopa de papa	4	7.00	1.75	0.07
9. Guiso de triguillo	7	10.50	1.50	0.06
10. Mote de habas	8	46.00	5.75	0.23
11. Sopa de chuño	9	60.50	6.72	0.27
12. Lagua de chuño	6	56.50	9.41	0.38
13. Comida de calabaza	6	44.22	7.37	0.29
14. Pejto de verdolaga	7	17.00	2.43	0.10
15. Mote de maíz	5	7.50	1.50	0.06
16. Papa huayku	6	15.00	2.50	0.10
17. Papa con huevo y llajhua	6	24.50	4.08	0.16
18. Chake de maíz con maní	9	27.00	3.00	0.12
19. Phuti de chuño	10	97.50	9.75	0.39
20. Papa con habas	6	58.25	9,71	0.39
21. Papa con queso	7	37.00	[illegible]	0.21
22. Papa con arroz	6	38.25	[illegible]	0.25
23. Papa con fideo	6	38.00	[illegible]	0.25
24. Papa con phuti de fideo	9	91.75	10	0.41
25. Ensalada de verduras	7	11.00	[illegible]	0.06
26. Tojorí	8	8.00	1.00	0.04
27. Ají de trigo	9	17.75	1.97	0.08
28. Phiri de trigo	7	8.00	1.14	0.05
29. Api de algarrobo	8	22.50	2.81	0.11
Average for meals without meat			3.81	0.15

COST OF REPRESENTATIVE MEALS EATEN BY RURAL HOUSEHOLDS
(1981 PRICES)

Name of Meal	Av. No. Persons Served	Average Total Cost	Cost per Person Pesos	Cost per Person US$
OTHER MEALS WITH MEAT				
1. Jolke	15	66.00	4.40	0.18
2. Shanka de pollo	6	118.00	19.67	0.79
3. Shanka de conejo	12	143.00	11.92	0.48
4. Pejtu de viceras (cerdo)	24	195.00	8.13	0.33
5. Fritanga (cerdo)	24	364.00	15.16	0.60
6. Ají de cordero	45	1,679.00	37.31	1.49
			16.10	0.64

OTHER MEALS WITH MEAT: When meat becomes the featured ingredient of a meal the average cost of a meal per person served can more than quadruple. In the case of the dishes outlined above, the cost increased from 3.81 to 16.10 pesos (US$0.15 to 0.64) per person. The cheapest dishes--jolke and pejtu de viceras--are made with internal organs. It will be noted that meals featuring meat are generally prepared for considerably larger groups of people, particularly if a pig or sheep has been slaughtered. This conclusion reinforces the observation that the butchering and eating of such animals is usually an important social event in the rural community. However, such events are often connected with a work day, or they imply the creation or repayment of a favor or other act of reciprocity. As such, the relatively high cost of preparing the meal can be seen as an investment rather than a consumption expenditure. For example, at 37.31 pesos per person, a sumptuous meal of ají de cordero cost less than the prevailing wage for hired laborers (50 pesos in 1981).

TOTAL COSTS OF THE DIET: Given the much higher cost of dishes with meat, and considering the very different levels of meat consumption from one community to the next, the cost of the average diet in Melga will be significantly different than that of Puca Puca or Huayculi. Let us assume that in each community the same number of meals are eaten--namely, 30 breakfasts and 30 "other" meals per month. Let us further assume that all breakfasts cost an average of 1.18 pesos, all meatless meals cost an average of 3.81 pesos, and all meals with meat cost an average of 16.10 pesos (as shown above in the list of 40 dishes).

Given these assumptions, the cost of the average diet for a single person in Puca Puca is estimated at 476.62 pesos (US$19.06) per month; that of Melga is estimated at 550.36 pesos (US$22.01); and that of Huayculí at 636.39 pesos (US$25.45). These figures are calculated as follows:

ESTIMATED COST OF MONTHLY DIET PER PERSON
(1981 PRICES)

Cost Components	Melga	Puca Puca	Huayculí
BREAKFAST			
Total meals per month	30	30	30
Cost per meal	1.18	1.18	1.18
Sub-Total	35.40	35.40	35.40
OTHER MEALS (MEATLESS)			
Total meals per month	76	82	69
Cost per meal	3.81	3.81	3.81
Sub-Total	289.56	312.42	262.89
OTHER MEALS (WITH MEAT)			
Total meals per month	14	8	21
Cost per meal	16.10	16.10	16.10
Sub-Total	225.40	128.80	338.10
TOTAL COST (Pesos)	550.36	476.62	636.39
US$	22.01	19.06	25.45

The above figures should only be considered as rough approximations rather than precise estimates. The average cost of so-called "meatless" meals is probably under-estimated because these dishes often include some meat for flavoring and nutritional purposes. Similarly, the average cost of meals with meat is probably over-estimated. The degree to which meat substitutes (like cheese, eggs, and peanuts) are used in many meatless dishes is not precisely known. The portion of purchased versus farm-produced ingredients varies considerably from one family to the next. For these and other reasons it is best to treat the foregoing calculations with caution.

WEEKLY MARKET PURCHASES

Normally, the rural housewife does her shopping once a week at the nearest feria or weekly market, especially those held on Sundays. It is difficult to generalize about what products are most frequently purchased, or the average amount spent by households each week, because expenditure patterns are highly variable from one family to the next and from one season to another. Several of the most important factors influencing market purchases are described below.

CASH AVAILABILITY

The most important constraint governing market purchases is quite simply the amount of cash a housewife has available to spend. When asked what they buy each week at the market, the majority of rural women would probably reply with a statement like: "It depends on how much money I have." This answer serves to dramatize the fact that each market trip tends to be a joint buying and selling operation. Once a week the housewife must answer two questions before she leaves for the market: (1) What do I need to buy? and (2) How am I going to pay for it? Rarely will she depart for market with enough cash to finance her planned purchases; somehow during the day she will have to raise funds.

Although the problem is essentially the same for most rural housewives, each one usually develops a specialized strategy for solving it. Some prefer to sell eggs, others cheese, still others may sell vegetables, chickens, firewood, pastries, chicha, spun yarn, ceramics, or a wide assortment of farm-grown produce to be sold wholesale or retailed a handful at a time. The woman who decides to walk to market rather than taking a truck may do so because the fare she economizes may be just enough to buy bread for her family. Some housewives will make a large market sale early in the day; they will take their earnings, buy a wholesale quantity of a certain product, and then sell it on a retail basis to make a small profit for the day. In these ways rural women manage to finance all or a portion of their supplies purchased for the coming week. Such activities require a good head for business and consumate bargaining skills. They compliment perfectly the basic rule of rural subsistence: maximum self reliance.

SEASONAL PURCHASES

Households in Melga produce enough potatoes to meet their consumption needs for this vegetable throughout the year. This is not the case, however, in Huayculí and Puca Puca, where home-grown potato supplies (if any exist to begin with) seldom last beyond five months after harvest. From September through March, many families in these two communities buy as much as 1-2 arrobas (25-50 pounds) of potatoes per week, and this single item alone can easily constitute three-fourths of total market expenditures for a given week.

Such considerations place an extremely heavy management responsibility on the rural housewife in particular. She must carefully ration available food stocks in storage--complimenting or substituting potatoes with other starches as frequently as possible--to make sure the family food budget does not outpace its cash earnings capacity during the lean season. In the event of a major crop failure, steps to generate additional cash income must be undertaken on a timely basis.

WEEKLY VERSUS BI-WEEKLY AND MONTHLY PURCHASES

There tend to be certain products that rural households buy once a week almost without fail. These tend to be the most perishable products such as tomatoes, onions, locotos, carrots, peas, green habas, and ají. In Huayculí, the average family almost always purchases 1/2 to 1 kilo of fresh meat each week, along with about a pound of lard. Other products purchased on a weekly basis are sugar and bread.

Rice, noodles, cooking oil, condiments, soap, candles, matches, and (in the case of Melga) tanks of gas for stoves are among the most common products purchased on a bi-weekly or monthly basis. Another item in this category would be salt blocks (for livestock consumption). The scheduling of purchases for such non-perishables is more complicated than it might first appear. This is because bulky purchases are much harder to carry by a person on foot, suggesting the need for a cargo animal or investing in a fare on motorized transport. In the latter case a double expenditure occurs involving the fare of the passenger plus the fare for the cargo.

On the average, market expenditures involving only [illegible] (mostly perishable) purchases ranged in 1981 from about 100 to 35[illegible] (US$4-14) depending on whether or not meat was purchased and also how much the housewife or members of her family decided to spend on a luxury expenditure at the market itself--like buying chicha and/or a special dish of cooked food. Another variable, of course, involved the use of motorized transport and the payment of passenger fares or cargo fees.

FOOD PRESERVATION

Electricity was recently installed in Melga, but in Huayculí and Puca Puca this service is not available. But even if it were, the purchase of a refrigerator is beyond the means of the average rural household. Their level of cash earnings also prevents them from purchasing canned food except on rare occasions. Thus, the preservation and storage of grain, vegetables, meat, and dairy products is accomplished by traditional methods that are timeless. To describe these practices in great detail would require a separate chapter or book devoted exclusively to this single subject. Instead, it was decided to present a rapid summary of food preservation methods taken from an in-depth interview conducted with a single rural household.

The informant selected for this interview was Fidelia Beizaga of Puca Puca. She was interviewed on April 5, 1982 by Marina Ortuño.

MARINA: Doña Fidelia, how rapidly you made the charke (dried meat) yesterday with Emilia! Do you always make charke each time you kill a sheep?

FIDELIA: We always make charkecito. It allows us to eat for many days. If we don't make it, the meat would not last even three days. It would acquire a bad smell and would no longer be edible. In three days we would barely have time to eat the entrails and organmeats. But with charke the meat of a sheep will last for a month. We also make charke from goats. The meat is cut into thin strips, we dry it in the sun, and once dry we store it in a basket hung from the ceiling. Charke must not be covered; it must get air. If it's covered the moths get to it, or the maggots. The only way to store charke is by exposing it to the air.

Sometimes when we butcher one of our cattle, or the animal dies and we have to rescue the meat, there is so much meat that there's not even enough time to make the usual charke, because if you don't dry the meat well it too will spoil and turn green. So to avoid this we first boil the meat, then we cut it into thin strips, and only then do we add salt and let the meat dry in the sun. We call this charke sancochado (parboiled charque). It will last as long as a whole year without spoiling, although for us it's usually all gone after one or two months, because not only do we have to feed our family but all the cousins too; they all must get their share.

MARINA: Why is is that the meat doesn't spoil if it is boiled?

FIDELIA: I don't know, but this is how we store meat when there is lots of it. I've seen the laricitos (people from Northern Potosí) making their khacha, which is what we call taking their corn and parboiling it and then drying it. They do this to avoid the thuta (moths) from destroying their grain and their seed. Only one boiling they give it, then they sun dry it and put it in bags. With this they can transport it long distances back to their homes, and they can store it all year too. Those poor people suffer so much when they come here! They even eat the skins of pumpkins because they say they have no food to bring with them. I feel so sorry for them. I always give them a little bit of our harvest; others will have nothing to do with them.

MARINA: Would you please tell me about other foods that you know how to store, like lard, eggs, flour, wheat, chancaca (block sugar), honey, and so on?

FIDELIA: We don't store very much around here. So much of what we eat is prepared to be eaten the same day. The lard is drained from the frying dish and I put it into clay pots, and after it has cooled I cover it with a piece of wood and store it in the despensa (pantry)...just on the ground surrounded by a few rocks. Then I cover the pot and the dirt around it with ashes to discourage the ants. Without ashes the ants will invade and dirty the lard as if it were candy.

Whenever we kill a pig we always make lard. I've never bought lard. I always make my own. If I run out there is always a neighbor who will lend me some of hers, and when I make my own I pay her back with my lard. From the pig we always dry the hide too. But this we don't salt. We just hang the skin in strips from a beam. I also dry the stomach and thus make it last for several meals. Once a year we kill a pig, and everyone longs for the moment.

Now as you know, we store our corn in trojes (silos constructed of woven sticks) without removing the husks, and this is enough to keep the moths away. We don't barpoil the grain like the Laricitos. The corn stored in troje remains healthy until planting day. Whenever we need any we just remove a few ears at a time. Whenever we harvest a [illegible] heat we store that in trojes too, but if there's not very much we just [illegible]re it in huirkhis (large clay pots used to ferment chicha) until it's time to wash it to make flour or directly for cooking. Potatoes too we store already selected--some for seed, others for eating, and the largest ones separately too. We never sell a single arroba of potatoes. There's never enough to sell. What we produce only lasts us about five months--until the Day of Saint Michael (July 25)--and after that we have to buy our potatoes. The seed we store in a corner of the pantry until planting; as long as it stays dry nothing happens to it.

Beans and peas we store in clay pots. We don't plant either ají or locotos, but neither do we buy much of these products either. Instead we collect ulpica (a wild plant which produces pea-sized berries that are very spicy). We boil the berries and then dry them in the son, then store them in a bottle or a jar. Some people store their khacha de ulpica as long as a whole year. We harvest ours around Carnival week (February) --but quickly, because the berries do not last very long--and they last until August. Ulpica tastes so much better fresh, but the green season of this fruit only lasts a month. Other families also make khacha with ají.

We also store pumpkins, but this does not have to be parboiled. We cut it in chunks, remove the skins, and hang the pieces to dry in the sun. As they dry they become very sweet. We make a conserva (jam or cream) from pumpkins which requires no sugar; all the sweetening comes from the sun. Another thing we store for year-round eating is algarrobo (carob beans), especially now that sugar is so expensive. We begin collecting the pods this time of year. Nobody has to plant anything; each family collects what it needs. The food stores for three months, and if placed in a troje it will last as long as a year. It is a wonderful food for the pigs; without eating very much of it they still get fat.

Now, what else do we store here?....The pumpkins and squashes, of course, which we store in the sun in one corner of the patio. Other families store cheese by making ticas (pressed cheese that is air-dried). They dry the cheese in the shade and then hang it in muyuris (circular plate of woven straw hung with four strands from a roofbeam). That way it doesn't spoil. For All Saints Day we store eggs for a month or so until we have enough for the urpus (special bread made for this festival). We place the eggs inside the clay pots containing quinua grain or wheat or peas....

MARINA: What about the products you buy in town...like rice, noodles, sugar, coffee, and other items--How do you store them?

FIDELIA: In plastic bags, the very ones they give us when we buy the products. But we never buy very much at one time--maybe a kilo at the most. We dry parsley and oregano in the sun and store it for a week or so in paper or pieces of nylon. We also dry other spices like manzanilla, cedrón, torongíl, to make tea for our breakfasts. I don't buy coffee; it's too expensive. Instead we use cinnamon, at least when there is sugar. Without sugar there's no breakfast.

As for cooked food, we never store it from one day to the next because it goes sour. The heat is very strong here. Nothing lasts very long. I will prepare wheat flour and store it for making laguas (porridges), but only for a few days...ground ají too, for three days at the very most.

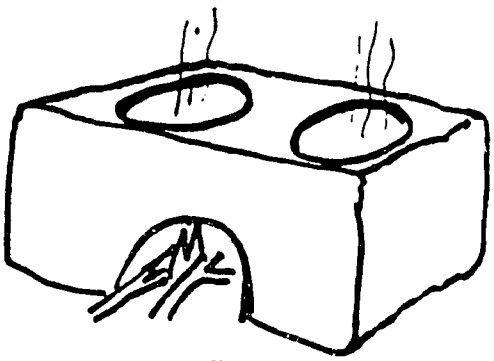
My son lives in Santa Cruz. He says that they store yuca there by burying it in the ground, and that it will stay fresh that way for a week. If not buried, the next day the yuka becomes khullu (uncookable, the longer it boils the harder it gets), even if it is boiled all day long. Each place has its customs. I've heard that you can make pito (toasted flour) from algarrobo. You have to grind it very fine, like powdered milk. They eat it dry or mixed with water. But we don't make this food, even though we have so much algarrobo.

MARINA: Doña Fidelia, by storing food do you save any money, or do you receive any particular benefit?

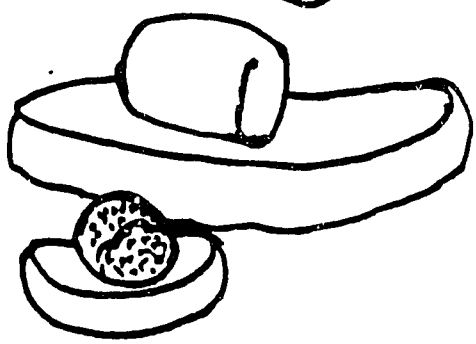
FIDELIA: If we had the money we could buy a year's supply of sugar, noodles, and rice. That would be much less expensive, especially today when it costs so much to buy these products. We have to store our production because we harvest only once a year. We have no other choice. Somehow or another we must always find a way to store our food.

KITCHEN EQUIPMENT

KONCHA: Although gas stoves are beginning to be used in a few rural communities like Melga, the koncha still remains the predominant cooking appliance. It is usually home-made from a mixture of chalk and wet clay. The typical koncha has two hornillas (burners) and is constructed about 50 cm. wide by 40 cm. high. For this reason, the activity of cooking is most comfortably conducted in a sitting position.

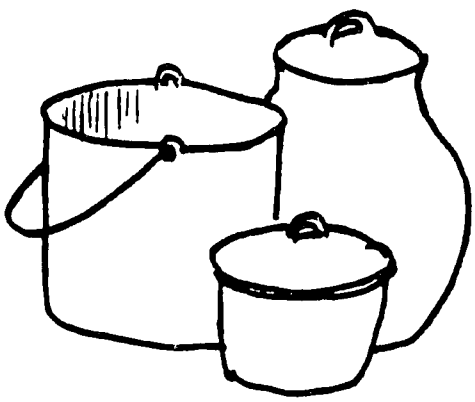


BATAN: Every rural kitchen requires at least one large grinding stone--which is variously known as a batán or marán--to mill grain, prepare spicy sauces (llajhua), etc.

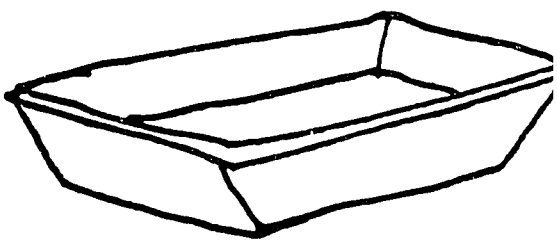


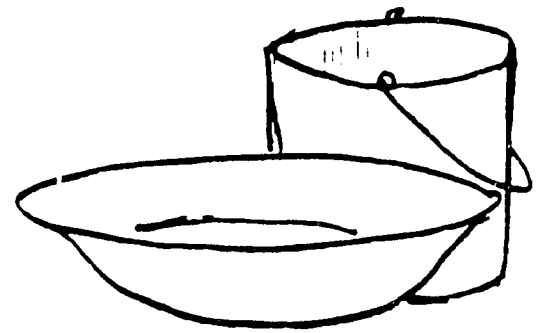
UÑA: A smaller handmill, the uña is used to grind condiments--like garlic, cumin, oregano, ají (hot pepper), and others.

OLLAS: In most rural communities the use of aluminum pots is becoming generalized. These pots have the advantage of being very light weight, have handles for easy carrying, and are practically unbreakable. Nevertheless, ceramic cooking posts still continue to be used in rural kitchens. These vessels are doubly convenient because they serve food storage functions as well as cooking.



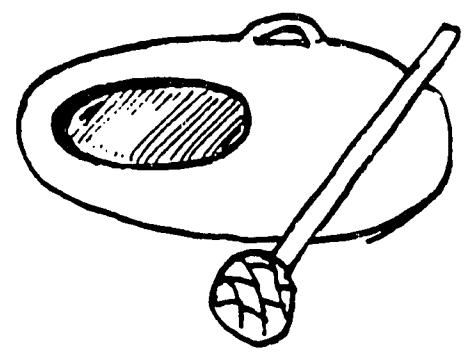
BATEA: Practically all rural kitchens have a batea (wooden trough) for mixing large quantities of dough, cleaning intestines, winnowing grain, and many cutting or chopping tasks; also for serving kitchen scraps to the pigs.



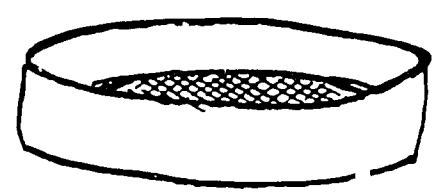


BASINS AND BUCKETS: Plastic washbasins and buckets are widely used by rural households. They have practically replaced clay vessels for a wide number of water hauling tasks. Plastic basins are also commonly used for mid-day meals at the work site, from which all participants serve themselves with their fingers.

PEROL: This is the traditional frying dish, usually made from copper. It can vary in size from 50 liter capacity (a cauldron) down to one liter. The perōl is being replaced in some kitchens with aluminum frying pans.



KANALLA: The ceramic oven is the primary instrument for toasting grain. It is sometimes made from a cracked clay cooking pot. Kanallas are best used outside the kitchen on a campfire exposed to wind. A bed of river sand is usually placed in the bottom of the oven, then the grain on top. The toasting grain is rolled and stirred on top of the sand using an implement known as the kachina, which consists of a stick attached to a ball of rags.



CEDAZO: Most rural kitchens employ a variety of sieves. Some are home-made, constructed from sardine cans. Others are made of plastic. For making doughs, straining lard, and rinsing grain washed in ash-water, many families use a large cedazo constructed of wooden sides with a woven horsehair mesh.

PLATES, BOWLS, AND CUPS: The variety of sizes and models are endless. However, most families have two kinds of utensils: enamel-covered tinware (for special occasions, preferred guests) and clay dishes, for ordinary use.

THE CHOCLO SEASON

Puca Puca's principal crop is corn, accounting for over 80 percent of cultivated land in the community. It is planted in December and January and harvested dry about five months later in May and June. About 90-100 days after planting--in late March and early April--the ears and kernals reach their maximum size but the husk is still green and the kernals are sweet and juicy. Ears of fresh corn are known as choclos, and the season of their appearance only lasts for about two or three weeks depending on how concentrated were the planting dates.

The start of the choclo season is signalled by intensified attacks from birds. Choclo corn is considered "bird candy". It is also greatly appreciated for human consumption. During the choclo season, the rural household will eat this seasonal food three and four times a day--even for breakfast. Every two or three days the family may harvest something like 40-100 ears. Boiled corn on the cob--known as choclo huayku--is the most common way the crop is eaten, and for the brief season of its appearance choclo huayku replaces the traditional mote (soaked and boiled dry corn) as the unfailing accompaniment to most meals. At this time of year there is always a pot on the stove containing cooked choclo, and children returning from school go directly to that pot. A visitor to the farmhouse in April is inevitably offered choclo too. In addition to choclo huayco, the fresh corn serves as the basis for other dishes as well. One is jaka lagua, a porridge made of ground choclo. But most popular of all are the delicious humintas, corn cakes made from ground choclo (sometimes combined with cheese), wrapped in corn husks and baked in an oven.

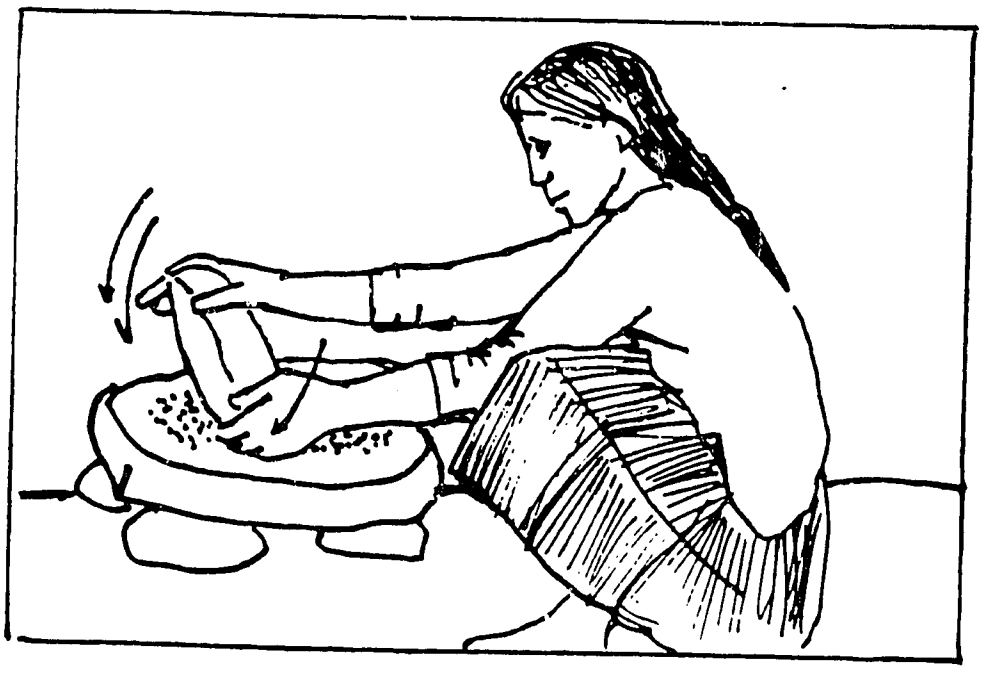
CHOCLO CAKES (HUMINTAS)

The following recipe was provided by Gregoria Fernandez of Puca Puca.

INGREDIENTS	ESTIMATED COST (pesos)	
Choclos: 130	130.00	
Lard: one pound	25.00	
Salt: 1/2 pound	3.00	
Sugar: to taste	1.00	
Cheese: four bollos	32.00	
Total	191.00	(US$7.64)

First, the choclos must be gathered in the field using baskets and bags. Women and children usually do the picking; they also head carry their loads back to the farmhouse. For the corn not to lose its sweetness and flavor, the preparation of the humintas should begin the same day or at the very latest the following day.

Next, the choclos are husked. This is done by taking each ear and cutting off the butt with a sharp knife. The leaves surrounding the ear can then be peeled off one at a time and placed to one side, for these will later be used to wrap the humintas prior to baking. Using the same knife, the kernals of each ear are sliced off and collected in a wooden trough. The husking and stripping of 130 choclos should take about an hour. Next, the kernals are ground on a stone handmill (batán). No water need be added. The milling process will require about two hours. The ground corn is collected in a plastic bucket. The stripped cobs will be collected and served to the pigs.



Woman Grinding Choclo With A Batán

The ground choclo is dumped into the wooden trough again it, sugar, and lard are mixed in to this mass using the hands. Onc ingredients are thoroughly mized, the cheese should be cut into sma chunks. Now the wrapping of the humintas begins. First, one takes a piece of green husk and deposits a spoonful of choclo dough. Then a piece of cheese is added. Both are wrapped up into a triangular-shaped package which is tied in place with strips from the same husk. The wrapped humintas are placed one by one on a tin sheet made from a discarded lard can.

While the wrapping occurs, the oven is being heated with firewood. When warm enough, the floor of the oven is swept clean with a broom made of stiff grass that is attached to a pole about three meters long. The humintas are now placed on a flat wooden shovel which in turn is used to place the pastries deep inside the oven in neat rows. The humintas are left to bake for about 35 minutes. Then they are removed using the same shovel and a hooked stick (tintarona). The first humintas are immediately eaten hot, beside the oven. The rest are stored to be eaten over the next few days. Humintas will last for about three days before spoiling.

Humintas can also be baked in a ceramic pot. This method is preferred when small quantities are being prepared, because the stoking of the outdoor oven requires considerable firewood and is quite time consuming as well. With pot-baking it is necessary to add a little water to the vessel to create steam.

Humintas are usually eaten for breakfast and supper in place of bread and sometimes as the meal itself. This pastry also makes a good snack food for children to take to school; together with a few boiled potatoes, humintas are easy to wrap up and carry in the pocket.

As a variation, huminta dough is sometimes made into tortillas and cooked on a flat rock which has been heated very hot. The tortilla cooks in about five minutes per side. It too makes a very convenient snack food for school children, or to eat on a long trip away from home.

Because choclos are so appreciated by farm families, and because of their variety of uses but limited storability, they are almost never sold. However, a few residents of Puca Puca do sell humintas at the Aiquile market, where these pastries were priced at two pesos apiece in 1981 (US$0.08) or the equivalent of a fresh egg.

CHOCLO PORRIDGE
(LAGUA DE CHOCLO)

During the choclo season, this dish will be prepared constantly--perhaps 3-4 times per week. Like chake, laguas are very plain and economical meals. The following recipe was provided by Fidelia Beizaga of Puca Puca. She prefers to add a small piece of meat for flavoring. When she does not have meat she will use lard, and sometimes cheese is used as a flavor enhancer and meat substitute. Even though laguas and chakes are served hot, they are considered "cold" dishes because of their rather plain taste. For this reason many housewives, like Fidelia, add abundant ají and condiments to spice up the meal to make it "hot".

INGREDIENTS	ESTIMATED COST (pesos)
Choclo: five ears	5.00
Onions: two heads	.50
Tomatoes: two	.50
Meat: four ounces	6.50
Potatoes: two pounds	4.00
Peas: a handful	5.00
Garlic, cumin, and salt	1.00
Ají colorado: three pods	1.00
Total	23.50 (US$0.94)

Serves four persons

This meal is completely prepared with the cook seated on the floor of her kitchen. The stove is home-made, constructed of clay, and stands about 40 centimeters high. A cooking pot is filled with three liters of water and heated until it boils. At this time the meat is added along with chopped onions and tomatoes plus the condiments, finely ground. While these ingredients are cooking, the choclos are husked and the kernal[illegible]ut off with a kitchen knife. The kernals are then ground into a wet [illegible]sing the handmill. Next the potatoes are peeled. After the pot has [illegible] boiling for 50 minutes the potatoes are added (these are small and r[illegible]n size) and will be left to cook for about 15 minutes. At this time [illegible] ground choclo is slowly added to the pot, stirring constantly with a wooden spooon. The contents will now be allowed to cook for another 20 minutes, but with frequent stirring to keep the lagua from sticking to the bottom of the pot. After that the dish is ready to serve.

BOILED WHEAT
(CHAKE DE TRIGO)

Chake de trigo is among the three most commonly-consumed meals in Melga, Puca Puca, and Huayculí. It is a very plain yet most filling dish, but its great popularity is assured by its extremely low cost. Chake serves as a substitute for rice and noodles. The following recipe, provided by a family in Huayculí, suggests a cost per serving of only 2.43 pesos (US$0.10) per person.

INGREDIENTS	ESTIMATED COST (pesos)	
Ground wheat: two pounds	10.00	
Potatoes: 1.5 pounds	3.00	
Onions: two heads, chopped	.50	
Tomatoes: two	.50	
Cooking oil: one spoonful	.50	
Mote: 1/2 pound	2.50	
Total	17.00	(US$0.68)

Serves seven persons

A pot with six liters of water is placed on the stove and heated until boiling. The wheat is coarsely ground in the batán. The idea is not to make flour but simply to remove the wheat husk and to break the kernals in half. The wheat is winnowed to remove the husks. When ready, the grain is added to the boiling water and left to cook for an hour. Once the wheat is soft, chopped onions and tomatoes are added along with a spoonful of salt and another of cooking oil. The ingredients are thoroughly mixed and left to cook on slow heat. Meanwhile, in a separate pot the potatoes are boiled; these have been previously peeled and halved. When cooked, the potatoes are drained and added to the chake. The meal is now ready to eat.

Chakes are also prepared with corn and quinua grain. The difference between chake and lagua (porridge) is that one is a dry meal, the other wet. With chake the grain is barely milled so that it can be boiled nearly whole. In contrast, for lagua the grain must be milled into a coarse flour; it is then added to a soup stock to thicken its consistency.

TOASTED CORN PORRIDGE
(LAGUA DE JANKA QUIPA)

Lagua de janka quipa is a commonly-consumed dish in all three communities, but it is most popular in Huayculí. It differs from the other grain porridges in that the grain is first toasted before being ground up and mixed with the other ingredients. The following recipe was provided by Carmela Ortuño of Huayculí.

INGREDIENTS	ESTIMATED COST (pesos)	
Water: two liters	-	
Meat: 1/4 kilo	10.00	
Toasted corn: one pound	2.00	
Papalisa: 1/2 pound	3.50	
Potatoes: two pounds	12.00	
Onions: three heads	.75	
Locoto: one	.50	
Tomato: one	.50	
Salt to taste	.50	
Chopped green onions	1.50	
Cumin and garlic	1.00	
Total	32.25	(US$1.29)

Serves five persons

The corn is first toasted in a ceramic oven (kanalla) containing a layer of fine river sand. The corn is turned continuously with a stick to keep it from burning. After ten minues the corn is removed and sifted to remove the sand. The corn is then milled with the hand grinding stone (called a marán in Huayculí), but only to produce a coarse rather than a fine meal. The papalisas are also ground up with the hand mill and placed to one side. A cooking pot with the water is brought to a boil on the [illegible]ve. When the water begins to boil, the meat is dropped into the pot a[illegible] with chopped onions, tomatoes, locoto, and condiments. Then the groun[illegible]alisa and salt is added. The potatoes are peeled, cut in half, an[illegible]ed to the pot. The contents are cooked for another 20 minutes. Now the [illegible]sted cornmeal is added little by little, stirring continuously with a wooden spoon. The mixture thickens. It is left to cook for another 10-15 minutes. When the meal is finally ready, it is served in ceramic bowls with chopped green onion sprinkled on top.

CREAMED PUMPKIN
(CONSERVA DE LACAYOTE)

Pumpkins are eaten in Puca Puca with two kinds of dishes: salty and sweet. The lacayotes are used in salty meals when they are still tender, not quite mature. At this stage they are mostly used in soups and stews (pejtos). However, once the skin of the pumpkin hardens and dries in the sun, the meat on the inside becomes sweet and is then used for sweet dishes only.

In Puca Puca all families grow squashes and pumpkins among their fields of corn and other crops. These vegetables are harvested when mature and placed on the roof of the farmhouse for period of 3-4 months. With constant exposure to alternating rain and sun, the outer skin of the pumpkin becomes black while the inside becomes very sweet and spongy. In this condition the vegetable is ready to be prepared into conserva. The following description is based on a meal prepared by Sabina Suarez of Puca Puca in August 1981.

The pumpkin is first placed on a slab of wood. Taking a stone, Sabina struck the vegetable repeatedly along the top and sides, which caused the dry skin to crack open in a number of different pieces. Using a knife, Sabina separated each piece. She was careful not to let any of them get dirty. Each piece was then cut so as to separate the outer skin from the inner flesh, and all seeds and fibers were scraped away. The prepared pumpkin pieces were collected in a plastic washbasin. In total they weighed about six pounds.

Sabina placed on her stove a cooking pot with a capacity of 12 liters. She emptied four cups of water into the pot and brought it to a boil. Without washing the pumpkin slices, she filled the pot to the brim. To this she added cinnamon and covered the pot tightly. The pumpkin was then cooked for about five hours. Not a grain of sugar was added. When the meal was ready it was a very thick, sweet-tasting soup.

Sabina's family--including her husband and three children--ate this meal in the patio of the farmhouse at about eight O'clock in the evening with the light of the moon. All ate in a squatting or sitting position, their bowls resting on the ground, using aluminum spoons. Sabina explained that the conserva de lacayote is an excellent medicine for the liver. She said they also eat lacayote watia (baked pumpkin) which is cooked over hot stones buried in the ground and allowed to bake all night long.

CHUÑO PORRIDGE
(LAGUA DE CHUÑO)

Chuño is dehydrated potatoes. Detailed descriptions of how this product is prepared will be found in Volume I of Our Knowledge and need not be repeated here. Because Melga has a colder climate and a highlands zone where frosts are reliable and the freeze drying of potatoes is assured, its residents are able to make their own chuño. In contrast, families in Puca Puca and Melga must buy or barter for their chuño supplies.

The following recipe is provided by Margarita Espinoza of Melga, who says her family consumes the meal at least once a week:

INGREDIENTS	ESTIMATED COST (pesos)	
Potatoes: three pounds	15.00	
Chuño: four ounces	7.00	
Habas verdes: 1/2 pound	2.50	
Onions: three heads	1.00	
Tomatoes: one	.50	
Locoto: one	.50	
Cooking oil: two spoonfuls	1.00	
Condiments	1.00	
Total	28.50	(US$1.14)

Serves six persons

Margarita uses a gas stove and cooks standing up. Her cooking pots are made of aluminum rather than clay. While she brings water to a boil she chops up the onions, tomato, and locoto. She peels the potatoes and cuts them into chunks. These ingredients are added to the boiling water and left to cook. Meanwhile she takes the chuño and grinds it into a coarse flour. The condiments are finely ground and added to the cooking pot. The green habas are added toward the end of the cooking peri When all the vegetables are tender, the chuño flour is added while st ng the thickening liquid to avoid lumps. The final consistency is more uid than solid, more like a thick soup than a porridge. The lagua is se in porcelain-covered tin plates and eaten with aluminum spoons.

SAMAY WITH POTATOES AND BROADBEANS

For ordinary work days, the two most common foods prepared for mid-day meals in Melga are boiled potatoes and broadbeans (habas). The meal is characterized by the utter simplicity and speed of its preparation, which perfectly adapts it to busy schedules. Such convenience, combined with its very low cost, means that this meal will be prepared three or four times a week.

The only complicated part of the meal involves the broadbeans. Usually dry habas are used. If simply dropped in a cooking pot, dry habas would have to boil all day before becoming tender enough to eat. However, there is a short cut. One must first toast the habas in a frying pan or ceramic oven until they are browned, almost burnt. While they are still burning hot, the habas are dropped into a pot of ice cold water. This causes the outer shell of the broadbeans to crack open (phatar), with the result that they will now cook much more rapidly. The pot of water is placed on the stove to heat. Into the same pot the potatoes are placed as well. It is not necessary to peel them first. There should be enough water in the pot to cover the habas and potatoes combined. The contents will be completely cooked within 30-45 minutes.

The meal can be easily cooked at the work site (on a simple campfire) so that it can be eaten warm; otherwise, its ingredients are prepared at the farmhouse and eaten cold at mid-day. The potatoes and habas are peeled at the time they are eaten. The meal is accompanied by a spicy llajhua sauce, which serves as a dip.

The following recipe for samay with potatoes and broadbeans was provided by Cayetana Trujillo of Melga.

INGREDIENTS	ESTIMATED COST (pesos)	
Potatoes: seven pounds	25.00	
Dry Habas: two kilos	20.00	
Locotos: three (for llajhua)	1.00	
Tomatoes: two (for llajhua)	0.50	
Total	46.50	(US$1.86)

Serves five persons

STEWED SQUASH
(PEJTU DE LACAYOTE)

From December through March one of the primary foods of rural families consists of dishes made from squash and pumpkins. These are variously referred to as escariotes, lacayotes, and calabazas. While in season, the farm household may consume these vegetables several times per week. Pejtu de lacayote is one of the most popular dishes. The following recipe was provided by Lucrecia Rojas of Melga.

INGREDIENTS	ESTIMATED COST (pesos)	
Lacayote: one	3.00	
Potatoes: four pounds	12.00	
Onions: four heads	1.50	
Tomatoes: two	.50	
Locoto: one	.50	
Ají: five pods	1.50	
Cumin and garlic	2.00	
Green habas: two pounds		
Choclos: 16 ears (used in place of mote)	31.00	
Total	54.00	(US$2.16)

Serves eight persons

The cooking pot is placed on the stove to heat. It is of seven liters capacity and filled half-way with water. The potatoes, which have been peeled beforehand, are put into the pot first. When the water begins to boil salt is added; the boiling continues for ten minutes. During this time the squash is cut up into pieces. The squash is added to the boiling water for the final 15-20 minutes required to cook the potatoes. In a separate pot the choclos (fresh ears of corn) are boiled. While the above ingredients are cooking, the onions, tomatoes, and condiments are chopped up and fried with oil in a frying pan. When the potatoes and squash are cooked, the water from their pot is drained and the spicy sauce of fried vegetables and condiments is added and mixed with a wooden spoon. Immediately the meal is served in enamel-covered tin plates. Two choclos per plate are provided.

SAMAY WITH QUINUA LEAVES

The early months of the calendar year coincide with the rainy season. This is known as the "green time", for their exists abundant pasture for livestock and many plants whose leaves can be utilized in meals. One such plant is quinua, which grows in a scattered fashion inside the potato fields. This is a double-purpose nutritional compliment to the diet of rural families because the leaves are edible at the mid-growth stage, and when mature quinua provides a highly nourishing grain that serves as a substitute for rice. The following recipe is provided by Cristina Castro of Melga.

INGREDIENTS	ESTIMATED COST (pesos)
Potatoes: four pounds	24.00
Tender quinua leaves: two *amarros* (clumps)	10.00
Cooking oil: three spoonfuls	2.00
Locotos: three, for llajhua	2.00
Tomato: one, for llajhua	1.00
Mote (boiled kernals of corn): one pound	8.00
Suico (aromatic herb): one portion, for llajhua	-
Total	47.00 (US$1.88)

Serves seven persons

Sitting on the kitchen floor, the first task is to peel the potatoes. These are added to a pot of boiling water, along with some salt. As the potatoes are cooking, the quinua leaves are chopped into smaller pieces and washed well with at least two rinses of water. About ten minutes before the potatoes are fully cooked, the quinua leaves are added to the boiling water. When both are ready, the water is drained. The cooking oil is now added and mixed thoroughly with the potatoes and quinua leaves. The food is immediately served on enamel-covered tin plates.

The samay is always served with llajhua sauce. The locotos, tomato, and suico are ground together with a little water and salt using a handmill. The sauce itself ends up with the consistency of marmelade; it is very spicy. The grinding task is performed in a squatting position, with the handmill sitting on the floor. Llajhua is usually prepared fresh each day, often just before every heavy meal. To serve seven people, the preparation of the sauce takes about seven minutes.

PURSLANE STEW
(PEJTU DE VERDOLAGA)

Another rainy season wild plant used in the rural diet is verdolaga or purslane. It grows between Decemeber and February in fields of potatoes and corn, usually along the boundaries. Purslane reaches a height of about 30 centimeters. Young children are sent out to collect it in baskets on the day it is to be eaten and usually only an hour or so before cooking. Verdolaga plants are pulled out of the ground by hand. Their leaves must then be picked individually, selecting only the tender young leaves and avoiding the mature ones, which are quite bitter-tasting. This picking of the leaves is called kijrar or kijrana. Between two persons about four armfuls (kepis) of verdolaga greens can be selected in half an hour. The following recipe for purslane stew was provided by Sabina Suarez of Puca Puca.

INGREDIENTS	ESTIMATED COST (pesos)	
Verdolaga leaves: four handfuls	-	
Potatoes: four pounds	10.00	
Ají: five pods	1.00	
Cumin and garlic	1.00	
Tomatoes: three	0.50	
Ulpica (a wild pepper): one portion	-	
Salt	.50	
Lard: two spoonfuls	3.00	
Onions: four heads	1.00	
Total	17.00	(US$0.68)

Serves seven persons

The verdolaga leaves must first be washed. The potatoes with their skins are placed on the stove to boil. Meanwhile, the tomatoes, onions, and condiments are chopped up and put in a bowl to one side. In a second pot the verdolaga greens are cooked for about 20 minutes; they are removed from the stove at about the same time the potatoes are completely cooked. The chopped vegetables and condiments are then fried with lard for about ten minutes to make a delicious vegetable spice sauce. The verdolaga greens are drained, then squeezed dry with the hands. The boiled potatoes are skinned, cut in half, and added to the verdolaga greens. Finally, the vegetable spice sauce is added to the potatoes and greens. The meal is now ready to be served. It will be accompanied by mote and llajhua sauce.

SPICY LAMB STEW
(AJI DE CORDERO)

Lamb stew is a very special meal, usually prepared for a large number of people in celebration of a holiday, wedding, baptism, homecoming or departure, etc. Although the market value of the ingredients used for the meal is quite high relative to other dishes, it is prepared almost exclusively with farm-grown produce (including the lamb). Unless purchased bread or alcoholic beverages accompany the meal, it involves a minimal cash outlay by the host family. The following recipe was taken from a fiesta in Melga involving 30 adults and 15 children, held in April 1982.

INGREDIENTS	ESTIMATED COST (pesos)
Ají de Cordero	
Lamb: about ten kilos	800.00
Ají (hot pepper): 1/2 pound	30.00
Potatoes: 25 pounds	180.00
Dry breadrolls: 20, ground	40.00
Cumin: one portion	10.00
Garlic: one head	5.00
Onion: one kepi (handful)	30.00
Tomato: one kilo	15.00
Peas: six pounds	30.00
Cooking oil: 1/4 liter	25.00
Green broadbeans (habas): six pounds	20.00
Peregíl (parsley): one handful	5.00
Carrots: two pounds	10.00
Firewood: one caballete (100 pounds)	100.00
Chuño Phuti con Salsa	
Chuño: 1/4 liter	75.00
Peanuts: one pound	90.00
Eggs: six	48.00
Cabbage: two heads	30.00
Onions: five heads	5.00
Tomato: one kilo	15.00
Locoto (hot pepper): 1/2 kilo	50.00
Lard: 1/4 pound	20.00
Salt: 1/2 pound	5.00
Llajhua	
Locoto: 1/4 kilo	25.00
Tomato: 1/4 kilo	4.00
Quilquiña: one portion	2.00
TOTAL	1,679.00 (US$67.16)

When preparing a meal for so many people the sheep must be butchered the day before. The potatoes are peeled and the chuños are left to soak from the previous evening. The cooking of the meal will require the following implements: three plastic washpans, three aluminum cooking pots, a frying dish (perol), two plastic buckets, a stone handmill, and two wooden spoons. Dishes and spoons to serve so many guests must be borrowed from among the neighbors.

Early in the morning, on an outdoor campfire built inside three adobe bricks, one cooking pot filled with water is heated until brought to a boil. The meat is dropped inside the pot along with some salt. As the meat cooks, the onions, locotos, tomatoes, carrots, and parsley are chopped. The condiments (cumin, garlic, pepper, and ají) are ground with the handmill. The vegetables and condiments are then combined in the perol with some oil and fried until brown, after which they are added to the cooking pot.

Next the chuño is prepared--with the help of several neighbors. The chuño, which has been soaking all evening in a bucket, is removed from the water and squeezed with the hands to remove all liquid. Any remaining pieces of skin are removed. The chuños are then broken into smaller pieces using the fingernails. The chuño is then placed in a second cooking pot to boil. The peeled potatoes are placed in a third pot to cook. To the pot with chuño only salt is added; the potatoes however are boiled with salt and green onions.

The peanuts are placed in a dish of boiling hot water to soak, then skinned and ground in the handmill. Once ground the peanuts are placed to fry in the perol with a little water and some lard. To this is added five heads of onion chopped up, also 1/2 pound of salt. When the peanut sauce has cooked, six chopped hardboiled eggs are mixed in. Separately a vegetable sauce is prepared consisting of chopped cabbage, onions, locotos, tomatoes, some salt, and a little oil. This sauce will be sprinkled over the chuño phuti (chuño with peanut sauce) once it is on the plate.

The bread is ground in the handmill and the crumbs are sprinkled into the cooking pot containing the meat, making sure to avoid the formation of lumps, until the mixture is the desired thickness. The ají de cordero is now ready to serve. Meanwhile, the water is drained from the cooked chuño and the peanut sauce mixed in to make chuno phuti. Before serving the guests, a toast with chicha is made to the Pachamama (spilling the beverage on the ground) along with a little food. The diety is asked to make sure there is enough food for all the guests and that they all will be satisfied. The meal is then served. The closest friends and relatives are served their food in porcelain covered tin plates, the others in clay bowls, and each receives an aluminum spoon. The chuño phuti is placed on

one side of the plate, the boiled potatoes on the other, and in the middle is placed the ají de cordero with its vegetable sauce on top. The llajhua sauce is placed in separate bowls that circulate among the guests. All guests find their most comfortable seating location--some sitting on benches, some on the ground, and others squatting.

In the event that not all one's neighbors were able to attend the event, plates of food will be prepared and taken to their homes for them to taste.

PREPARING TRIPE
(LAVADO DE PANZA DE VACA)

In early October 1981 Emilia Claros of Puca Puca purchased a kilo of tripe at the Aiquile Sunday market. It cost 25 pesos (US$1) whereas a kilo of beef would have cost at least 60 pesos (US$2.40). Squatting on the dirt floor of her kitchen, and accompanied by her young son, she prepared the meat in the following fashion.

First the meat was washed. Emilia placed the tripe in a washbasin, poured warm water over it, and proceeded to rub the skin back and forth vigorously. The basin was drained and fresh water added; she washed the meat a second time, then a third, and finally a fourth. Next, Emilia had her son hold one end of the piece of tripe while she stretched out the meat and began to cut it into strips. The strips were then cut into smaller pieces. With the cutting finished, Emilia washed the meat still another time. To test that the tripe was clean and odor free she first licked the meat and then smelled it.

The chopped tripe was placed in a pot of boiling water and left to cook for half an hour. Meanwhile, she peeled several potatoes and placed these to cook in another pot. Next, she ground up hot peppers, cumin, and garlic with her handmill, a task which required exactly 12 minutes. These condiments were then fried with a little oil for several minutes. The potatoes were drained and cut in half. The tripe was then drained as well. All ingredients were mixed together and left heating a few moments while Emilia washed several plates and called her family to eat. The meal was served with boiled corn (mote) and spicy llajhua sauce made with ulpica, a wild chili pepper plant that grows in Puca Puca. Emilia's husband and three children joined her in a circle on the kitchen floor, all eating their meal in a squatting position.

ORGANMEAT STEW
(JOLKE)

When a rural family butchers a sheep, every bit of the animal is used--including the head, hooves, and intestines. Jolke is a spicy soup made from the intestines and stomach. The following recipe is provided by Irene Ferrufino of Huayculí.

INGREDIENTS	ESTIMATED COST (pesos)	
Intestines and stomach of a sheep	30.00	
Dish of sheep's blood	5.00	
Potatoes: 6 pounds	20.00	
Onions: four heads	1.00	
Chopped green onions: a plateful	3.00	
Ají colorado (hot pepper) and salt	2.00	
Oil: four spoonfuls	5.00	
Total	66.00	(US$2.64)

Serves 15 people

The intestines and stomach should be well-washed, with several changes of water. They should then be cooked (boiled) for at least two hours. The blood should be boiled in a separate pot, and the potatoes--already skinned--should be boiled separately as well.

The onions and ají should be chopped up and fried with oil in a frying pan until brown. When the organmeats have cooked for two hours, these should be cut up into small chunks. The browned vegetables are then mixed with the organmeats. Once cooked, the blood should be removed from the water, drained, then placed in a ceramic toasting oven (with a spoonful of oil) and cooked for ten minutes. The blood, organmeats, and potatoes are finally mixed together and served--with their broth--in individual bowls.

Irene serves jolke each time she butchers a sheep, which is about once every two or three months. She has never made it with purchased organmeats. She believes that this dish is perhaps as nourishing as the roasted meat.

GUINEA PIG STEW
(SHANKA DE CONEJO)

In mid-October 1981 Andrea Alvarez prepared shanka de cordero using two guinea pigs she had raised herself in a pen located in the patio of her home. The meal served 12 people, not because they were guests at a party at her home but because it is a custom to always send servings to one's neighbors when a special meal is prepared. Andrea always prepares two guinea pigs at a time; in the course of the year she thinks she probably consumes about 20 of these animals. The following narrative first describes how the guinea pigs are prepared for cooking, then presents Andra's recipe for shanka de conejo.

PREPARING THE GUINEA PIGS

Two guinea pigs old enough to be eaten were taken from their pen. Because the animals were thoroughly frightened, Andrea first put them in a basket with a lid and left them alone for awhile until they calmed down. Later, she removed the first conejo, placed it on the ground, stepped on its feet so it could not move, stretched out the animal's neck with one hand, and using a sharp kitchen knife severed its juglar vein. The dead conejo was drained of its blood and then placed in a bowl. The second guinea pig was dispatched the same way.

Each conejo was then soaked with boiling water to facilitate removal of the pelt. The hair was removed using thumb and index finger of both hands. To eliminate any partial hair that might remain, Andrea held the animal's body over the flame of her stove and with a deft rotating motion allowed the fire to singe the entire skin of the guinea pig. Next, with a kitchen knife, Andrea cut the skin connections between the animal's limbs and its body. With a vertical cut from the anus to the chest she exposed the internal organs and carefully removed them to avoid puncturing them. Upon encountering the gall blader, Andrea immediately put it in her mouth and swallowed it whole as if it were a pill.(She later explained she did this because a guinea pig's bladder is considered a medicine for any ailment, but particularly heart disease. The trick, of course, is to swallow the organ intact so as to avoid tasting its bitter contents; these will subsequently be released in the stomach. Andrea is quite knowledgeable on this matter because she works as a curandera (traditional healer) in Huayculf). The guinea pig's stomach, large and small intestines were thrown on the ground, where they were immediately eaten by Andrea's dog. The liver, kidneys, and heart were saved to be cooked with the conejo.

Each guinea pig was skinned and gutted in a similar fashion. Their bodies were quartered and thrown into a pot of boiling water which had been abundantly salted. The heads and the feet were cooked as well. Andrea explained that the head contains the most nourishing part of the animal, while the legs--although in miniscule quantity--have the sweetest meat.

RECIPE FOR SHANKA

INGREDIENTS	ESTIMATED COST (pesos)
Guinea pigs: two	80.00
Noodles: one kilo	26.00
Potatoes: seven pounds	20.00
Cooking oil: one cup	10.00
Ají: six pods	3.00
Onions: five heads	4.00
Tomatoes: three	2.00
Cumin, garlic, and salt	2.00
Total	143.00 (US$5.72)

While the conejos are cooking, Andrea peeled the potatoes and put them into a separate pot of boiling water to cook. The ají, onions, tomatoes, and condiments she chopped up and placed in a dish. When the potatoes and meat had finished cooking, she cooked the noodles in salted water and then browned them in a frying pan with oil. Finally, she fried the chopped vegetables and condiments for about 15 minutes, adding the meat at the very end to mix it thoroughly with the spicy sause. The dish was served with the guinea pig stew placed on top of a bed of noodles, and boiled potatoes on the side.

The entire meal was prepared with Andrea squatting on the floor of her kitchen next to her stove and surrounded by dishes and pots. Before serving the meal she first made the sign of the cross over the pot of stew, then let fall a few drops on the ground as an offering to the Pachamama. Her male guests ate seated at a table; all females sat on the ground to eat. The meal was consumed with great haste, for shortly afterwards all participants, including Andrea, departed in a group on foot to attend the religious celebration being held that day in the community of Sichis, five kilometers distant.

KILLING A CHICKEN

Chicken is considered a food for special occasions: for birthdays, the visit of a friend, celebration of a sale or purchase, and so on. But poultry will sometimes be eaten as well when a disease has struck the flock, because once a bird dies it is too late. On the other hand, whether or not a chicken dish is prepared also depends on availability. Normally, a laying hen will only rarely be butchered for her meat. Each housewife keeps a kind of inventory of which birds are ready for eating and which or not.

Once the decision to cook a particular bird has been made, the housewife goes out to feed her flock. She takes special care to cast the kernals of corn as close to her body as possible to entice the selected chicken within arm's reach. Then suddenly she grabs the bird by its legs. Placing it under her arm, she ties the chicken's legs together so that it will not be able to escape and takes it to the kitchen.

She then places a pot filled with about three liters of water on the stove to boil. While the water is heating she returns to the chicken with a sharp kitchen knife and takes the bird to the patio. She places the chicken on the ground, steps on its legs, stretches out its neck with her left hand, and with the right hand quickly cuts the bird's throat (but without severing the neck completely). The chicken shakes and kicks for 2-3 minutes, its blood draining out on the ground. The lifeless body is then placed in a washbasin. When the water in the kitchen has boiled it is poured over the feathers to soften them for plucking, a process which begins immediately with the housewife using the thumb and indez finger of both hands. The head and legs of the body are cut off and these are plucked separately. The warm water has softened the claws as well; these can be removed with a little tug. The chicken is now placed on a plate. The feathers and the used water are thrown away behind the farmhouse.

The bird is now gutted with a horizontal cut which permits the removal of the breast intact. The intestines, organs, gizzard are removed and carefully washed. The body of the bird is quartered and washed as well, along with the feet and head. The entire process of plucking, gutting, and cleaning the animal is performed in a squatting position. From beginning to end the dressing of the chicken requires about 35 minutes.

CHICKEN STEW
(SHANKA DE POLLO)

Shanka is a typical dish of the Cochabamba region, and it is eaten in the city as well as rural areas. It is usually prepared for a special occasion. Shankas are prepared with either chicken or guinea pig. The following recipe was contributed by Juliana Olivera of Melga.

INGREDIENTS	ESTIMATED COST
One chicken	70.00
Potatoes: six pounds	21.00
Noodles: 3/4 of a kilo	13.50
Onions: five heads	2.00
Tomatoes: two	1.00
Green peas: one pound, shelled	5.00
Cooking oil: four tablespoons	4.00
Locotos (hot peppers): two	1.00
Salt: two ounces	0.50
Total	118.00 (US$4.72)

Serves six persons

The chicken is cut up into its different pieces and cooked in boiling water. In a separate pot the noodles are cooked. When these are done they are fried with the oil in a frying pan until browned. To this is added the chopped onions, tomatoes, and locotos, which are mixed and fryed together. The potatoes--whole and peeled--are added to the pot with the chicken and cooked until done. The peas are added a short while after the potatoes. When all ingredients are cooked, they are combined in a single plate and served.

BUTCHERING A PIG

On November 11, 1981 the family of Ciriaco Rosales of Puca Puca decided to butcher a pig. The participants in this event were two women and six men. The pig they butchered was 20 months old, an animal that was born and raised entirely on the farm.

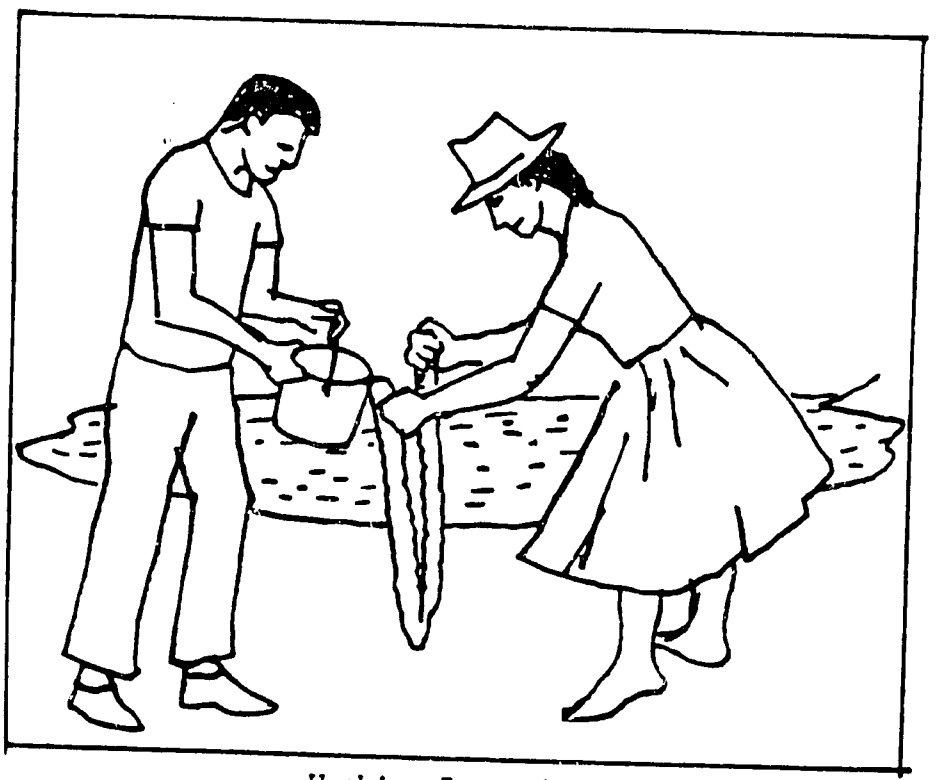
The day began with the boiling of water in a large copper basin. As the water began to boil, five of the six men entered the pig pen to grab the doomed animal--one person for each of the legs and the fifth to hold the head. The sixth man, using a fine pocket knife, dispatched the screaming pig with a sure blow to the heart. The six men then carried the dead beast and placed it on a platform made of several logs covered with wood slabs. The pig, in a sleeping position, was then soaked with a bucket of cold water; this was done to placate the agitation created in the animal a few minutes before. The butchering party paused to drink a round of chicha. Several toasts were made along the following vein: that the animal yield three arrobas of lard, that its hide (chicharrón) be enough for all guests and relatives, that the pig not have trichinosis, etc.

The women now began to bring buckets of boiling water. The men poured the water over the pig for about two minutes, and toard the end they tested by pulling with their fingers to see if the hide was becoming soft enough to scrape. The scraping was done with kitchen knives. As it continued, more boiling water was poured on selected spots to facilitate the process. Finally, the animal's hooves were soaked for a few minutes in the hot water, after which each hoof was easily pulled off its leg with a gentle tug. The snout of the animal was likewise bathed in hot water, then scraped clean. At this point the pig was lathered with soap and given a shave to remove all vestiges of hair and leave the skin perfectly smooth.

The pig was then placed on its back. The body cavity was then opened with a vertical cut from the chest down to the genitals. The chest cavity was completely full of warm blood. Indeed, to keep the blood from draining, the animal's dispatcher had sewed the wound closed with stitches of wool thread. The blood was now removed with a tin cup and collected in a clay jar--to be used later in preparing blood sausage or morcilla. Next, the pig's gall bladder was carefully removed. The bile was emptied into a cup, mixed with sugar, and then served with a spoon to one of the children. Bile is considered an excellent medicine against all disease.

The gutting of the animal continued. The large and small intestines, stomach, heart, liver, and lungs were removed and placed in a wooden trough. These organmeats were taken away by the women to be washed and prepared. First attention was given to the liver, heart, and lungs. These were carefully stripped of their fat, washed in several rinses of water, and placed in a cooking pot with four liters of water. Peeled potatoes, onions, and assorted condiments were added to prepare a thick organmeat stew known as pejtu de viceras (see recipe below).

Next came the preparation of the stomach, which consisted of separating the inner lining from the rest of the organ. This job required two women, one to hold the stomach and the other to do the cutting. The lining was removed in about 20 minutes. It was fed to the dog. The remaining skin of the organ was thoroughly washed. Having completed the hardest part of their work, the women celebrated their achievement with a round of chicha.



Washing Intestines

Next came the washing of the intestines. This task was conducted by two women at the edge of the family's holding pond located a short distance from the farmhouse. First, the large intestine was cut in half. Each woman took a piece, and by squeezing and sliding her fist managed to remove the bulk of the excrement inside the intestine. Next, each piece was filled with water, shaken vigorously, emptied, and the process repeated several times. Using the fingers only, each piece was turned inside out; it was then scrubbed and beaten in a washpan as if it were laundry.

The small intestines were similarly cut into pieces and their excrement removed. Because of their narrow diameter, these could not be filled with water. However, a slender stick with a hook at one end was inserted into each intestine piece and pulled to turn the lining inside out. These too were washed vigorously and with repeated rinses until all mucus of any kind had disappeared. The washing of the large and small intestines as well as the stomach required about an hour between the two women. The intestines were hung to dry in the sun on a wire stretched across the patio of the farmhouse. The skin of the stomach was hung beside them. These pieces were to be eaten as charke during the following weeks.

The pejtu de viceras (organmeat stew) was served to all participants at day's end. Including portions sent to neighbors and relatives a total of 24 persons were served--15 adults and nine children. The recipe and preparation was as follows:

ORGANMEAT STEW
(PEJTU DE VICERAS)

INGREDIENTS	ESTIMATED COST (pesos)	
Pig heart: one	15.00	
Pig liver: about one kilo	30.00	
Lungs: two of 1/2 kilo each	20.00	
Potatoes: 1/2 arroba (12.5 pounds)	25.00	
Ají: one pound	15.00	
Garlic: four ounces	5.00	
Cumin: one ounce	5.00	
Green onions: eight pounds	25.00	
Oregano, parsley	10.00	
Mote: six pounds	30.00	
Total	180.00	(US$7.20)

The organmeats are cut into pieces and placed in a cooking pot containing four liters of boiling water. The potatoes are added. Meanwhile, the onions are chopped and the condiments are ground up. When these ingredients are ready, a clay pot is placed on the stove with a little water and two

spoonfuls of lard. In this second pot the ground condiments and chopped onions are fried to form what is called an ahogado or spicy vegetable sauce. Finally, the potatoes and organmeats are drained and added to the ahogado, mixing the ingredients thoroughly. The stew is now ready to eat. It is served in clay bowls. The participants arrange themselves in a circle; in the center is a large bowl filled with boiled corn (mote) from which everybody serves themselves with their fingers.When all family members and guests have eaten their fill, portions of the stew are sent to the homes of friends and neighbors who could not be present.

PORK FRIES
(CHICHARRON Y FRITANGA DE CERDO)

The following day the butchering of the pig was completed. The rendering of the lard took most of the day. The fat and skin were cut into narrow strips and fried to make chicharrón (fried pork rind) while pieces of meat and bones were also fried to make fritanga (assorted pork fries). Most of the fresh pork meat was carefully cleaned of its fat, cut in strips, and hung to sun dry as charke. Four ceramic cooking pots were employed: one to serve participants, the second to prepare fries for friends and neighbors, and the third and fourth pots for future family consumption. Pork fries not eaten during the day were hung from a roof-beam inside the kitchen--where it would be fairly free of dust and well out of the reach of the family's dog and cat. The frying of the pig yielded about three arrobas (75 pounds) of lard. The recipes and preparation for chicharrón and fritanga are presented below.

CHICHARRON

Each cooking pot is filled to the brim with pork fat and skin strips. After half an hour of cooking enough of the fat has melted to allow the pot to be half-filled again with more pork fat. Every 30 minutes the pot is drained of its melted lard. This liquid is poured through a straw strainer into a porcelain pot--the vessel in which the lard will be stored. For each pot the total cooking time for the pork is an hour and a half. After this length of time the fried pork rinda are removed, strained, and immediately served. Chicharrón is eaten with the fingers. It is accompanied by boiled corn and llajua sauce. It is also customary to serve chicha with pork fries--a practice intended "to kill" the pig (dilute the grease).

FRITANGA

The meat pieces (with bones) are briefly fried in the cooking pot until browned. The grease is drained. Water is then added until the meat is covered. Salt is also added. The meat should then be cooked for a period of about two hours. Potatoes are boiled in a separate pot. Onions are chopped and condiments are ground to make an ahogado. Eventually the potatoes are

cut in half and added to the spice sauce. Finally, when the pork fries are completely cooked, these are mixed thoroughly with the other ingredients to make a stew. The eating of pork "dry", without sauce of any kind, is considered an ugly taste experience by most rural people. And of course the meal is incomplete without boiled corn and llajhua sauce.

INGREDIENTS	ESTIMATED COST (pesos)
Pork: five kilos of meat	250.00
Potatoes: 12.5 pounds	30.00
Onions: two bunches	40.00
Ají: 1/2 pound	20.00
Cumin: one ounce	5.00
Garlic: three heads	5.00
Oregano and salt	1.00
Lard: three spoonfuls	6.00
Ulpica: one portion, for llajhua	2.00
Tomatoes: six	5.00
Total	364.00 (US$14.56)

Serves 24 persons

HUSKING WHEAT WITH ASHES
(PELADO DE TRIGO)

There are two ways to husk wheat. The first is to gently mill the grain with a handmill, then winnow away the chaff by pouring the grain from one recepticle to another. The second method is to boil wheat in a solution of water and ashes; this allows the husks to be rubbed off by hand. The following description of wheat husking with ashes is based on a demonstration by Carmela Ortuño of Huayculí.

Carmela took a cooking pot of 15 liters capacity, filled it one-third with water, and placed it to heat on the stove. When the water had begun to steam she added four platefuls of ashes; this material she had previously gathered from her kitchen stove and screened carefully to remove all charcoal and stones, leaving only a fine ash dust. The ashes were mixed with the water until completely dissolved. Carmela next added 3.5 kilos of wheat to the ash water solution. She boiled the contents for 40 minutes, then added four more platefuls of ashes, and cooked the liquid for another 35 minutes. During this time she sat on the ground beside her stove, stirring the pot constantly. Finally she removed the pot from the heat, stirred it for five more minutes, tested a few grains with her fingers to see if they were soft enough to husk, and let the pot cool for 20 minutes.

The contents of the pot--which now resembled a wet, grey dough--were emptied into a wheelbarrow. Carmela pushed the wheelbarrow over to the family's well. The first of several buckets of water were drawn from the well. Some water was poured over the wheat and mixed about. Then, using both hands, Carmela began to rub the swollen grains between her palms. Handful after handful of grain was rubbed in this fashion. The wheelbarrow was then tilted to drain the water, which carried off husks and debris. A second washing with fresh water occurred, followed by more rubbing, rinsing, and draining. This process continued until Carmela had used three buckets of fresh water, and until the grey color of the grain had completely been replaced by yellow and the rinse water ran clear upon leaving the wheelbarrow.

The clean husked wheat was then added to a cooking pot. The individual grains had swollen by now to three times their original size. The wheat cooked for 90 minutes. When ready to eat it had taken on the appearance of rice. The dish is known as <u>trigo lluchuska</u>. It is quite popular in Huayculí, where it often serves as a substitute for mote (boiled corn) or habas to compliment other food. LLuchuska is also a traditional dish eaten on All Soul's Day, when families await the coming of the spirits of their deceased relatives.

SKINING CORN

Like wheat, corn kernals also have a tight skin covering the grain. Ashes are also used to skin corn; however, the process is somewhat different than with wheat. To begin with, less ashes are used. When wheat is skinned, approximately equal quantities of ash and grain are required; with corn the ratio is only one to four. Secondly, the grain need not be boiled as long in the ash water: only 20 minutes is needed for the skins to become soft enough to rub off by hand.

As with wheat, the corn must be rubbed and rinsed repeatedly until all skins and ash coloring has been washed away. The grain will then appear very yellow and swollen almost double its normal size. It then becomes necessary to boil the skinned corn with plenty of water, followed by another washing with fresh water. This time the drained water will have a yellow color. The rinsing continues until the drained water rinses clear.

After careful washing the corn must be extended on a ground cloth and sun dried for about two days, or longer if the sunshine is intermittent. The corn should be turned over once during that period. Once dry the grain is usually stored in clay pots or tins. Boiled corn can be stored as well in bags, but that way it is more exposed to damage by rats.

Ash-skinned corn has the double advantage of requiring far less cooking time (which also saves on firewood or other fuel), and of long durability in storage. The procedure is far more common in Melga and Huayculí--where home-grown corn supplies are very scarce--than in Puca Puca. On the average, a family in Melga or Huayculí will skin corn two or three times a year, with each batch amounting to about an arroba (25 pounds). This is a sufficient quantity to last 2-3 months under normal consumption. Skinned corn is usually eaten as mote. It is considered a substitute for rice and noodles.

TOASTING GRAIN

Corn, wheat, and dry peas and broadbeans are all grains which are commonly toasted by rural households. Once toasted, they can be eaten whole--as a snackfood or accompaniment to meals. In this case the skin of peas and broadbeans must be cracked open (using the teeth or fingers) before the inside grain is eaten; toasted wheat or corn can be eaten with their skins. Another use of toasted grain is to grind it into flour with a handmill. Flour of toasted grain is known as pito. It is frequently eaten dry at breakfast as a substitute for bread. Pito is also used in making laguas (porridge) and other soft foods. It is one of the principal foods eaten by old people who have lost their teeth. Families with a son serving in the army often send him gifts of pito and charke (dried meat).

The toasting of grain takes place in a ceramic oven known as a kanalla. Often the canalla is nothing more than an old cooking pot which has been cracked or otherwise damaged. Such a pot or oven has an opening on one side. It is commonly heated by resting it on three rocks surrounding an outside campfire. Open-air toasting is preferable because the wind causes the fire to burn more intensely, thereby generating more heat.

When the oven is hot enough for toasting, a handful of fine (river) sand called lama is placed in the bottom of the kanalla. The grain to be toasted is then placed on top of the sand. The grain must be stirred and turned for a period of ten minutes. This is done with an implement called the kachina, which consists of a wooden stick to which has been attached a ball of rags at one end. The kachina serves to roll and turn the grain without disturbing the sand. Once the grain is toasted it should be placed in a sieve to separate out any sand. The sand itself can be reused again and again.

Toasted corn and wheat will last about a week in dry storage; after that these grains begin to acquire a bitter taste and become hard. Peas and broadbeans can be stored for a month after toasting.

BREAD MAKING (ROSQUILLAS)

Bread is not a daily consumption item for most rural families. At best, the housewife may buy a one-day supply of bread at the Sunday market, which will be gone by supper or breakfast the following morning. To buy more bread is not practicable because the product grows dry and stale so quickly, and because it requires a cash expenditure. To make one's own bread is not very practicable either. Bread-making is quite labor-intensive, and few rural women have the time to devote to it as a routine activity. Secondly, to bake bread requires the heating of the family's outdoor oven. A single firing of the oven normally requires a complete burro load of firewood, which itself must be gathered and transported. Not counting the time spent in fuel gathering, the firewood alone had a local market value of 20-25 pesos (US$0.80-1.00) in 1981. Thus, heating an oven is something the average family does less than ten times a year. Finally, to grind one's own flour for bread-making is also too laborious. Most housewives find it more efficient to take their grain to a local commercial mill for grinding into flour; but this too costs money--at least five pesos (US$0.20) per arroba in 1981. For these reasons baking bread is usually a rare "special" event for the farm household.

But rare though it is, the bread-making activity is of intrinsic interest because it demonstrates how rural families make maximum use of their ovens. Moreover, baking is usually undertaken with a commercial objective in mind; it is seen as an opportunity to earn some cash income. The following narrative describes the making of a bread product known as rosquillas. It is based on observation of Gregoria Suarez of Puca Puca, who baked 100 rosquillas on December 27, 1980.

INGREDIENTS	ESTIMATED COST (pesos)	
Yeast: one ounce	5.00	
Corn flour: one arroba	125.00	
Goat's milk: eight bottles	40.00	
Lard: four ounces	5.00	
Sugar: 1/4 pound	2.00	
Firewood: one carga (load)	20.00	
Total	197.00	(US$7.88)

Makes 100 rosquillas

The yeast was placed in warm water to soak for an hour. Meanwhile, Gregoria began to sift the corn flour. The flour had been milled the day before in Aiquile. Spreading a cloth on the ground in front of her (almost on her lap), Gregoria used a strainer known as a cedazo for the sifting task. The implement is round with a frame of wood and a screen made of woven horsehair. She shook the cedazo with both hands. Residues were emptied on a cloth beside her; these were to be given to the pigs. The sifting of the flour took an hour to complete.

The flour was then placed in a wooden trough. At the center of this trough Gregoria placed the fermented yeast. Little by little she began to mix it with the flour using her hands and squeezing the dough repeatedly. The goat milk was also added a little at a time and worked in to form a thick batter. The contents of the trough were then covered with a phullu (woven wool blanket) and allowed to rise for a period of two hours.

Gregoria had prepared beforehand little round molds made of corn husks. When the batter had risen, Gregoria added the liquified lard and sugar, mixing these ingredients thoroughly. She now began to take the thickened batter one handful at a time and place it in the molds. By squeezing the mold an oblong-shaped pastry was achieved; others were given a round shape. The rosquilla doughs were themselves arranged neatly in rows on top of a phullu and left to air-dry for about an hour.

Meanwhile, Gregoria's husband had been stoking the oven with firewood he had collected that day. The oven is a dome-shaped structure standing on five wooden legs (one in the center). The oven floor and walls are lined with baked mud. The outer layer of the oven is covered with a layer of finely chopped straw, which helps to hold in the heat. The fire to heat the oven had been built on top of the oven floor, with fuelwood being introduced through the main door of the structure. The oven was considered to have achieved an adequate temperature when the clay around the oven door had turned grey. The hot ashes and coals were immediately emptied from the oven using a broom with a handle three meters long.

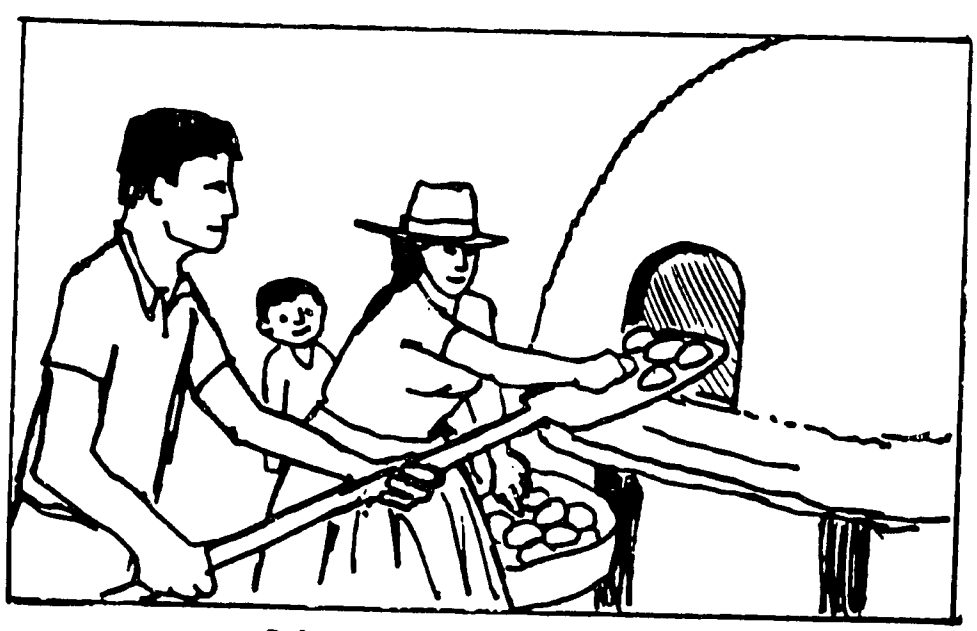
When the oven was clean and ready, Gregoria brought the rosquillas on a wooden trough to the entrance. Her husband placed them on a thin wooden shovel--one batch at a time--and began loading them inside the oven. When fully loaded, the oven door was closed with a piece of tin. The baking only took a few minutes--until the pastries were golden brown. The rosquillas were removed once more using the wooden shovel, but this time assisted by the use of a long slender stick with a hoe-like blade attached to one end to "rake" the pastries onto the shovel. As one batch after another were removed they were loaded into a basket. Each rosquilla was inspected individually and wiped clean of ashes using a rag. Children and adults all served themselves a warm pastry. A dozen or two were set aside for family consumption. The rest of the pastries were placed in a basket to be taken to the Aiquile market for sale the following day.

If all costs of materials are considered, baking rosquillas is hardly a profitable operation. Were she to sell all her pastries, the most Gregoria could earn was 200 pesos (US$8.00) given the prevailing market price of two pesos per rosquilla. Meanwhile, her listed costs (see ingredients) were 197 pesos. However, these costs do not include (1) the milling of the corn, (2) the transport of the rosquillas to market, and (3) her own--and her husband's time--required to mill the flour, prepare the dough, gather the firewood, bake the pastries, and an entire day to market them.

Gregoria's motivation for making rosquillas does not include an expectation of profit. Why does she do it? "For my children", she says. "Every day they are asking for bread. Every day they have to eat mote (boiled corn) instead, and they're so tired of it. They at least should be able to try something different now and then. So long as I mostly use our products, and if I can just recover in sales the money I spent, the rest doesn't matter....I do this for my huahuas (babies)."

MULTIPLE USE OF A HEATED OVEN

It merits passing mention that a heated oven represents an investment in firewood which a rural family will attempt to maximize. After the bread or rosquillas are removed, some households will take advantage of the residual heat to toast a batch of peanuts. Others put sliced pumplins in the oven and let it bake all night long. Still another use of a hot oven is to slow-cook cactus plants, the ashes of which are made into llujta, an alkaloid product used in the chewing of coca leaves to release their narcotic effect.



Baking in an Outdoor Oven

MAKING GOAT-CHEESE

Two thirds of the families in Puca Puca raise goats, and most of them make goat cheese. This product is mostly prepared during the abundant pasture season, when supplies of milk exceed the requirements of nursing kids. Goat cheese is primarily made for market sale. This product constitutes one of the primary ways in which farm housewives earn cash to finance weekly food purchases. However, cheese is also made for family consumption. It is regarded as a meat substitute, and because of its nutritional value the cheese season is anxiously anticipated each year. Cheese is used in a wide variety of dishes. It is served with boiled corn and choclos (fresh corn), mixed with laguas (porridge), pejtus(stews), soups, pastries, and snacks.

PREPARING THE CUAJO

Cheese-making begins with the preparation of the cuajo or coagulant. In Puca Puca housewives know about store-bought coagulants but they do not trust them, preferring to make their own. Home-made cuajo is prepared from the stomach of a butchered lamb or kid. The stomach is removed, turned inside out, scrubbed clean, and turned back again. The stomach is then filled with chopped green figs, a few leaves of a local herb known as penco, and a dash of salt. Both ends of the organ are sewn up and shaken about. The stomach is then hung from a kitchen roofbeam, where it will be exposed daily to the warmth and smoke of the stove. After about two months this stomach--when soaked in warm water--is strong enough to curdle fresh goat milk within an hour. The natural cuajo has no defined expiration date and continues to be effective after a year. It's strength, however, diminishes with each use, so the preparation of new cuajos from one year to the next is advisable. Some household's report that cuajo can also be made from cow's stomachs, although it is considered less potent and requires more time to cause coagulation.

MAKING THE CHEESE

The procedure for collecting the goat milk was described elsewhere (see GOATS, Chapter IV). The cuajo is first soaked in warm water or the skimmed milk (suero) of the day before for a period of two hours; this produces the coagulant agent. It is then added to the pot or bucket of fresh milk, the contents stirred thoroughly, and the mixture left alone (covered) until it has coagulated--usually 30 minutes to an hour. When this has occurred, the milk will have separated into solids (on the bottom) and

liquid (above). The solid material is taken up with the hands, squeezed to remove as much liquid as possible, formed into a bollo (loaf), and placed on a plate to drain. At this stage the material is known as cuajada (milk curd). Then, in a larger dish or bowl the curd is crumbled apart, sprinkled with salt, and reformed--by squeezing with the hands--into one or more loafs; the latter are now properly considered to be cheese. Each loaf should weigh about a half-pound and requires nearly two bottles (liters) of milk. In 1980 a cheese like this sold for about ten pesos (US$0.40) in the Aiquile market.

Cheese-making in the fashion described above is an activity conducted exclusively by women. As mentioned at the outset, it is usually a seasonal activity at best, one that allows the housewife to finance food purchases for her family. It is noteworthy that goat milk is never sold fresh. This is largely due to a series of local beliefs which relate accidents with milk to damages to the milk animals. For example, it is believed that if goat milk boils over on the stove, the teats of the goat will crack and her milk will dry up. Similarly, if her milk is spilled on the ground the spot must be immediately rinsed with water to dilute the liquid; otherwise the animal will lose her milk supply.

MAKING CHICHA

Chicha is an alcoholic beverage made from corn. It is extremely popular with rural (and urban) people throughout the Valleys region, both as a simple refreshment as well as an intoxicating drink for celebrating special occasions. Members of farm households almost always treat themselves to at least one glass of chicha every time they go to market. The beverage is considered an absolute requirement at workdays to which minga (exchange) laborers are participating. Chicha is always drunk to celebrate a child's first haircut. It is usually prepared for all major festive dates in the social calendar of rural communities.

There are two kinds of chicha and reasons for preparing it. Chicha gratis (free chicha) is made to invite friends and relatives at a workday or special event. Chicha para venta (chicha for sale) is a principal source of cash income for rural housewives. In the former case, families take turns during the year making the beverage, and women in particular frequently exchange labor to assist each other. However, making chicha for sale is a private affair. Indeed, a few households buy chicha wholesale and then retail it within the community for a modest profit, thereby dispensing altogether with the preparation of the beverage itself. Nonetheless, most sale chicha is made by the family selling it, and this may occur as often as once a month. A few households specialize in selling not the chicha itself but the raw materials for fermenting the beverage.

Chicha is made almost exclusively by women. Men only cooperate with the gathering of firewood, and perhaps more importantly growing the corn required to make the beverage.

PREPARATIONS

Assuming the availability of corn, it must first be shelled by hand. Then the grain must be ground into flour. A typical batch of chicha will require five arrobas (125 pounds) of ground corn flour. Practically all rural women prefer to take the corn to be processed in a local, commercial mill thanto grind the grain themselves. The transport of the grain to the mill, the milling, and the return trip requires a day of the housewife's busy schedule. The milling cost in 1981 was five pesos (US$0.20) per arroba.

Making a batch of chicha with five arrobas of flour will require 4-6 loads of firewood, because the cooking fire will be kept burning for nearly two days. For cooking the primary ingredient used in the process the fire must be kept going for 20 hours. In Melga, firewood must be purchased. In Huayculí and Puca Puca the firewood is free, but it must be gathered from 3-5 kilometers distant. Just to gather the fuel will require at least one full day's work by the male head-of-household. The market value of each load was about 25 pesos (US$1.00) in 1981.

The next required ingredient is water. Five arrobas of flour will convert to four arrobas of muco or huiñapo (the fermentation agent), and this is enough to make about 400 liters of chicha. Because some of the liquid is boiled away in the process of cooking, about 500 liters of water is the miniumum requirement. Depending on the distance of the water source from the farmhouse, hauling and storing the necessary water will take anywhere from four hours to an entire day. Sometimes men cooperate with this task, but only if there are not urgent field tasks to be done; otherwise water haulage is frequently done by women.

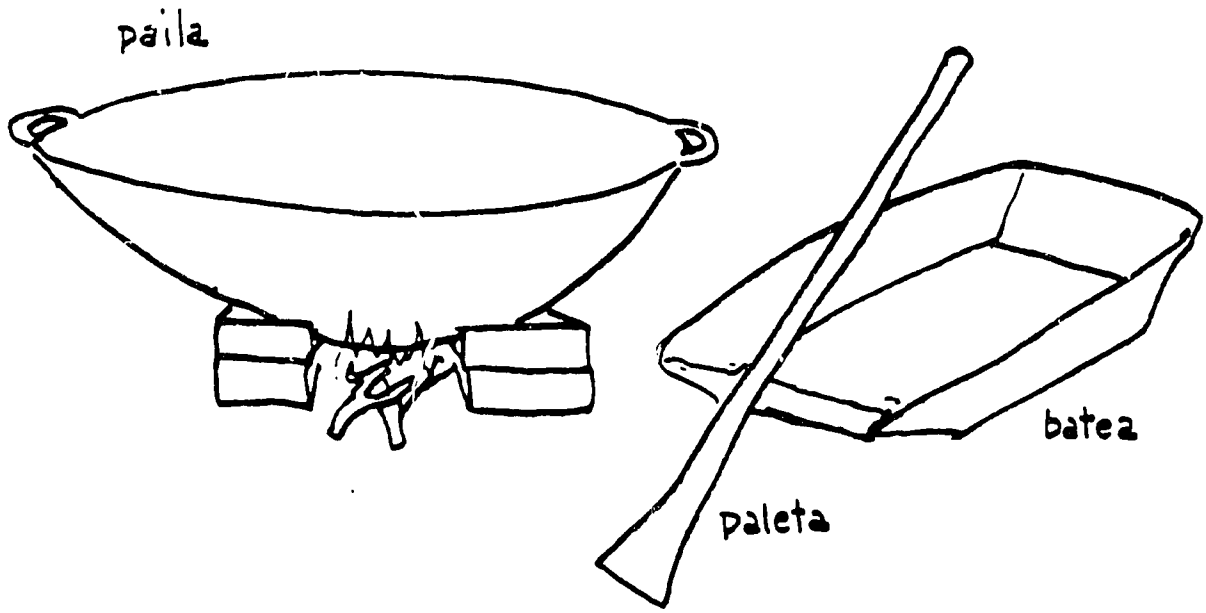
MAKING THE FERMENTATION AGENT

There are two different fermentation agents that are commonly used for making chicha. The first is called muco and consists of masticated corn flour. The second is known as huiñapo, which is sprouted corn that has been ground. These two raw materials are quite different in their method of preparation and must be described separately.

Chicha made with muco is known as simi muku. It represents the most traditional method of preparing chicha and is the one still used exclusively in Puca Puca. About three kilos of corn flour are placed in a wooden trough or batea. Cold water is added to this flour, just enough to make a soft, wet dough. The ingredients are mixed together with a wooden stiring stick called paleta. When the dough is of the proper consistency it is placed in a large cooking pan known as a paila (about 300 liters capacity). The dough is toasted for about 15-20 minutes and must be stirred constantly to prevent it from burning. When the dough acquires a slightly crumbly consistency it is removed from the heat. If free chicha is being prepared (employing the voluntary cooperation of neighbors), it is customary to sprinkle the toasted dough--now known as saice--with warm sugar water. The dough must then be molded into bite-sized little balls and placed in the trough. The trough is covered with a phullu (blanket) until the evening, when the mastication of the saice will begin.

The process of masticating corn meal into muco is called the muqueado or mukuna. In the case of chicha for sale, all the mastication must be done by family laborers, but when free chicha is being prepared it is customary for neighbors (women and children) to assist in the making of muco. The guests sit on sheepskins in a circle surrounding a recipient into which they are to spit. Each saice ball is placed in the mouth one at a time. It is chewed for about one minute until the saliva has turned the doughball to mush, then spit out. Normally, a minga to masticate muco takes place in the evening, when more pressing chores are completed. A minga of this type usually lasts from one to two hours. For example, three pounds of dough could be masticated in a space of 90 minutes between three adults and four minors. To pay its guests for their masticating co-operation, the host family usually serves a special plate of food--most often a soup--to all participants when the mastication is concluded. The slimy muco is left to ferment all night long.

The following day the muco is mixed with fresh corn flour--one part muco to four parts flour--combined with a quantity of liquid known as hupi (see below)--water in which corn flour has been mixed and allowed to settle out. The muco, flour, and hupi are mixed together vigorously with the hands; in fact, the ingredients are scrubbed. The mixture must be extremely well blended until there are no lumps of dry flour remaining. While still humid, the dough-like material is spread out on a blanket on the ground to sun-dry for 1-2 days. During this period it should be turned several times. This dried muco is also known as ckako. It is now ready to be used to make chicha.



THE ALTERNATIVE: HUIÑAPO

In Melga and Huayculí the fermentation agent is huiñapo, which involves no mastication of any kind. First the shelled corn is placed in a virque (a clay cistern of 400 liters capacity) or a turrfl (200 liter metal drum). The grain is covered with cold water and left to soak for three days. During this time the kernals will swell to twice their normal size. After soaking the corn is removed from the water to a straw basket, where it drains for several hours. Still damp, the grain is spread on top of a phullu stretched on the ground. The grain is covered with eucalyptus branches, and on top of them is stretched another blanket to form a roof. In this warm, dark shelter the damp corn is left 5-9 days until it sprouts. Once the grain is well sprouted, the coverings are removed. The corn is then sun-dried for 1-2 days, with several turnings. The dry, sprouted kernals are finally loaded into a sack and taken to a commercial mill for grinding. This is done on stone rather than metalic rollers to produce a coarse flour special for making chicha.

PREPARING THE CHICHA

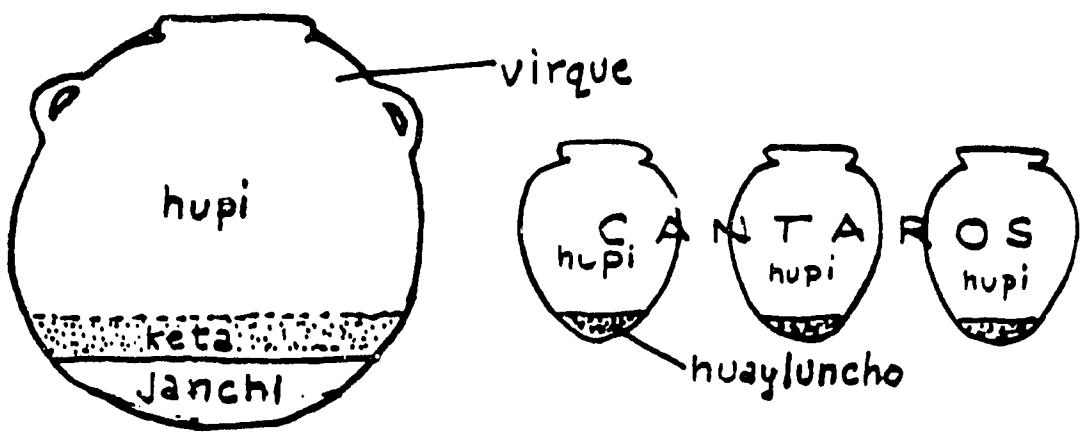
The virque is emptied and cleaned dry. About 50 liters of warm water are emptied into the cistern. To this is added the muco or huiñapo, which must be mixed until thoroughly dissolved. The remaining capacity is then filled with boiling water heated in the paila. The contents are allowed to settle for 30 minutes. After settling, the liquid is removed, boiled once again in the paila, and returned to the virque. This time tne contents are allowed to settle for 4-6 hours.

After the sediment has settled for a second time, the liquid in the cistern is removed and poured into clay pots or cantaros where it will be left until the following day. This liquid is known as hupi. Remaining in the cistern are two layers of sediment: a fine, upper layer known as keta and a coarse lower level known as janchi. The keta is carefully removed using a gourd and placed in the paila. There the keta will be cooked for the next 20 hours—first with a hot flame, then with a low flame--with almost continuous stirring to keep the thickening syrup from burning. At this task the housewife will remain awake all night long. She will stir with a chaihuina, which is a paleta that has a metal tip. By the time her vigil is complete, the contents of the paila will have shrunk three "buttons" (rivets) or four finger-widths; this is equivalent to a loss of about one-third of the total volume. This slow-cooked keta is often made with chunks of block sugar, which gives it the name of miski keta (sweet keta). The sweetening makes for much stronger chicha and a much faster intoxification. Miski keta is also known as arrope.

Meanwhile, it is necessary to return to the cistern. After the keta was removed, a coarse sediment remained. Into this sediment a bottomless basket is placed. Boiling water is again added. The mixture of the janchi and the boiling water causes a liquid to seep through the walls of the basket. This liquid is known as kaima keta. The kaima keta is removed with a gourd, cinnamon is added, and the ingredients boiled briefly to make a syrup or api. This sweet dish is a special favorite of children, and when chicha is made this becomes their supper. portions of kaima keta are also sent around to the neighbors. Some families also prepare a special supper made of janchi (the coarse sediment) combined with potatoes, boiled corn, habas, and llajhua spice sauce. Even with these reductions, the quantity of janchi that remains will fill several buckets. This product is spread on blankets, sun-dried, and is subsequently fed to pigs. Chicha-makers commonly assert that nothing fattens pigs like janchi.

After the arrope has cooked for twenty hours it is removed from the paila and set aside in a recepticle to cool. With the paila empty it is now time to boil the hupi. This liquid is now removed from the clay pots and added to the paila. The hupi is boiled for two hours--about 100 liters at a time--and then dumped into the now-empty cistern. After all the hupi has been boiled and stored, the virque is covered and its contents left to cool for an entire day. Meanwhile, from the clay pots that formerly contained the hupi another sediment is recovered. This is known as huayluncho or hupi ñeke. Like the kaima keta before it, the huayluncho is also boiled and made into a sweet syrup. Again, it is a favorite of children and is shared with friends and neighbors.

The stage is finally set for the making of the chicha itself. When the hupi in the cistern has cooled, the arrope is ready to be added. It is now dry and has a dark coffee color. This material is dissolved first with some hupi to form a liquid syrup, then is added to the hupi-filled cistern and mixed thoroughly. The contents are now distributed into the clay pots (cantaros), each one is covered tightly with a piece of plastic, and the beverage left to ferment four days to become chicha.



MARKETING

When a rural family has chicha to sell, its first and usually its only market is the community itself. A white flag is attached to an 8-10 meter pole and placed beside the farmhouse. This flag is known as a pendón. The housewife sometimes actively persuades passer-bys to stop for a drink. The first person to drink from a batch of fresh chicha is called the kallari. To entice him to stop, the housewife may offer him a galeta or free drink. If he accepts the drink he is obligated to buy one or more additional glasses. When a new jug or cistern is uncovered, the very top of the liquid--called akha ñahui or "eye of the chicha"--must be skimmed off. This film is considered a sign that the chicha is good; however, the skim itself is given to the pigs. Similarly, when a jug or cistern is empty of its chicha, there will remain a sediment known as khoncho. Like janchi, the sediment of fermented chicha is likewise an excellent product for fattening pigs.

Some households sell chicha on a permanent, daily basis. They serve the function of the local bar or pub. In such cases the seller usually buys the chicha already prepared at a wholesale price of, say, 80 pesos per lata (20 liter tin can) and sells it for 120 or 130 pesos. Chicha is often sold for credit as well as cash. If sold on credit, the seller may be repaid in labor, produce, livestock, a share of the harvest, seed, or cash.

Like bread, cheese, and other products commonly sold by rural housewives, making chicha is never very profitable if raw materials, fuel, and labor costs are calculated at their full market value. At best, by selling chicha the housewife can earn cash income that is 4-5 times greater than her cash expenditures. At 1980-1981 prices, 600 pesos of net cash income from selling a batch of chicha would be enough to finance a typical family's market purchases for at least two weeks. The following example of Emilia Claros of Puca Puca serves to illustrate the point. In August 1980 Emilia prepared and sold a cistern of chicha. The total economic costs and returns of this operation yielded a deficit of 305 pesos (US$12.20). However, since Emilia paid nothing for fuel, corn, or her family's labor, she managed to earn a net cash income of 639 pesos (US$25.56).

INGREDIENTS FOR A BATCH OF CHICHA	ESTIMATED COST (pesos)	CASH OUTLAYS
Corn flour: 5.5 arrobas	734.00	
Milling cost	28.00	28.00
Sugar: seven kilos	98.00	98.00
Cinnamon and clove	20.00	20.00
Firewood: four loads	60.00	
Family labor: 3 days	150.00	
Total Cost	1,090.00	146.00
Income: cash sales	785.00	785.00
Net Income (Deficit)	(305.00)	639.00

CHAPTER VI.

HYGIENE AND HEALTH

This chapter begins with a description of the serious disadvantages faced by rural households in attempting to maintain decent conditions of personal hygiene and clean living conditions. Topics covered in this section include drawing water for daily use, washing clothes, taking a bath, combing and braiding hair, mending clothes, and sweeping the house.

Next is covered the very core of rural medicine: traditional ailments and their supposed cures. Eight very common maladies are described, most of them credited to supernatural causes. The emphasis given to these health problems is intended to dramatize the fact that most rural households believe there exist two very different kinds of sickness: those that can only be diagnosed and cured by traditional healers, and those that are best treated by doctors. In this sense traditional and modern medicine are not seen as competing with each other; rather they represent different specializations. This section concludes with transcripts of interviews with a traditional healer, the mother of a sick child, and a woman with a fractured arm. In their personal statements these people express a wide variety of prevailing attitudes that help to place traditional health practices in better perspective.

The chapter ends with two brief sections describing health practices largely within the control of the rural household. The first of these covers childbirth and breast feeding of infants. The second deals with an assortment of aches, pains, and minor ailments.

PERSONAL HYGIENE

Compared to urban dwellers, rural households are at an extreme disadvantage in their efforts to keep clean. In the first place, their exposure to dirt and contaminating substances is extremely high. Farm tasks bring family members into constant contact with the soil, whether mud or dust, and sometimes with very toxic materials such as insecticides. The strenuousness of most farm tasks causes the worker to sweat profusely, which provides a medium for dirt to stick to the body. But even while resting, members of the farm family continue to be exposed to an unclean environment. The typical farmhouse has a dirt floor; its corners are usually devoted to storage areas for produce, or for storing farming tools. For lack of a table and chairs, the family usually takes its meals sitting on the ground. The cooking of meals and the washing of dishes both take place close to the ground. Most households do not have beds or cots, so their members sleep on the ground as well, and sometimes they wrap themselves in blankets which have previously been used for drying products in the sun and other uses involving contact with the ground. Lack of latrines, the free roaming of poultry or household pets in and out of the farmhouse, and the constant exposure of the homestead itself to windblown debris—this all means that the patio and interior of the dwelling gets dirtier faster and requires at least daily sweeping to maintain even minimally adequate standards of cleanliness.

If their exposure to dirt is much higher, the farm family's available resources for cleaning their bodies and clothing are generally quite meagre. Home installations of running water do not exist. Water storage capacity within or near the farmhouse is normally so limited that it must be carefully rationed and replenished daily. To wash clothes, the majority of rural housewives must walk several kilometers to the nearest river washing site. So few are the clothes owned by family members that a single set of clothing will be worn for a week; often the same set will be worn for weeks on end but removed for washing and mending about once every 7-10 days.

The daily washing ritual of course varies from household to household, but in general the full body bath takes place only about once a week, with partial washings inbetween. Women usually take advantage of their weekly laundry trip to the river to also take a complete bath. Washing of the hair is done once or twice weekly; rural women are quite fastidious about this ritual, not only for reasons of pride and good grooming but also because clean hair is a prerequisite to control of lice.

DRAWING WATER FOR DAILY USE

The first activity of the day for many rural housewives is to replenish their family's daily water supply. The difficulty of this task depends on the type and location of the water source, which varies greatly from one community and household to another. In Huayculf, most households have their own hand-dug well, or one within convenient walking distance that is shared with neighbors or relatives. Most of these wells employ a bucket and pulley system for bringing the water to the surface, and most have a protective roof, wall, or lid. In Melga, many residents have a home in the community urbanization (designed and constructed with the assistance of an external agency promoting rural housing) which is served by a potable water system featuring several public faucets. Families living outside the urbanization must fetch their water in buckets from the river, or depend upon small holding ponds built near their homes which are filled periodically with water drawn off during irrigations. In Puca Puca, about half the residents have holding ponds near their homes, but most dry up for several months a year; the nearest alternative is a meagre spring-fed puddle (about one kilometer from the community center), which in turn feeds a galería filtrante (underground water collection system) that was built by eight families to irrigate small plots of vegetables.

But irregardless of the water source or location, the quantity of water drawn and used for daily use is extremely limited. The level of water consumption by the average family, under normal use patterns, probably does not exceed 40 liters a day. This includes water for cooking, drinking, dishwashing, partial bathing, and watering minor livestock. Complete baths and the washing of clothes is normally done with river water.

WASHING CLOTHES

The rural housewife thinks in terms of two kinds of laundry: "small" and "large". Ropa chica (small clothing) consists of the garments that have to be washed almost on a daily basis, like baby diapers. These are usually washed in a basin at the farmhouse. Basin-washed clothes frequently involve the use of a commercial detergent. The same is true for washing pots and eating utensils.

Ropa grande consists of the larger garments and (when used) bedsheets, which are washed every 7-10 days. The choice of the day for doing laundry is determined by whether or not there is sunshine. A cold or cloudy day will result in postponement of the task, first because the sun facilitates the

bleaching and drying of clothes, and secondly because doing laundry is almost always combined with personal bathing--and nobody likes to bathe on a cold day. Exceptions to this rule may arise when the need to prepare for a special event takes precedence over personal comfort. Rural people place high value on looking clean in public, particularly for a community fiests, trip to market, and attendence at a meeting or religious service.

The dirty laundry is loaded into a blanket or sheet. The housewife carries this burden (for several kilometers) to the river. If she has a nursing child, she must carry this additional burden as well. Sometimes she leaves her older children at the farmhouse. Because they often have only one set of clothing, on laundry day they may spend several hours half-naked until their clothes have been washed, dried, and returned to them.

Once at the riverbank, the housewife separates the dirty clothing into light and dark colored garments. She selects a flat rock at the water's edge. If not properly positioned already, the rock should be placed on a slant to facilitate runoff of water and suds. First, the garments are soaked. Next, each garment is rubbed with a bar of laundry soap and then, without rubbing or rinsing, left to soak in direct exposure to the sun. After 10-15 minutes of soaking, each soaped garment is removed from the water and vigorously rubbed and slapped against the rock. The slapping is intended to loosen the dirt imbedded in the garment. The rinsing of each garment is done in a pool located in the current of the river. Finally, the clothes are dried by stretching them over rocks, bushes, or grass found along the riverbank. Laundry not completely dried at the river will be hung on a clothesline back at the farmhouse. It is not customary to iron clothes; they are simply stretched for drying, which eliminates most of the wrinkles.

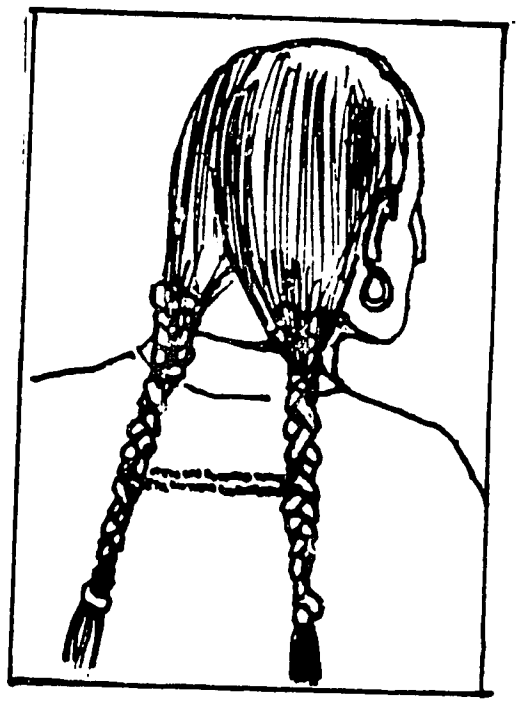
TAKING A BATH

With the recently-washed laundry stretched out to dry at the riverbank, the housewife bathes herself. First she washes her hair, most likely using the same laundry soap, with two latherings and rinses. Next, she washes her hands and feet. For this she takes a stone of medium coarseness, which she uses--combined with soap--to rub out the ingrained dirt. For personal bathing, the use of toilet soap is considered a luxury. The housewife normally bathes while dressed in her undergarments; her outer skirts and blouse have already been removed, washed, and left to dry. If there is enough water, she will enter the river to the depth of her waist or she can wash sitting down. Few rural households use towels. To dry the face a petticoat, flannel skirt, clean diaper, or other convenient garment is used; the rest of the body and the hair is left to sun-dry. It is precisely this lack of towels that makes bathing on a cold or cloudy day so very uncomfortable.

It is noteworthy that rural women wash their hair with a variety of very different cleansing agents. One, as just described, is laundry soap. Another is common dishwashing detergent, the most popular brand being a product manufactured in Peru known as Ace. Younger women are demonstrating a preference for commercial shampoos, which are packaged in little plastic envelopes (each enough for a single use) that can be purchased individually. When there is inadequate cash to purchase any of the above, rural women can fall back on traditional products. Of these the most common is lejía (lye) or water boiled with ashes. Legía is reputed to be particularly effective in treating dandruff. Another product is rotten urine, known to provide a very attractive sheen to the hair. Finally there is a wild vine plant known as the ñetera; its seeds are finely ground and when mixed with water produce a lather. The disadvantage of using ñetera, however, is that after the hair dries the seed reminants remain here and there resembling dandruff, but these can be removed with a little patient combing.

COMBING AND BRAIDING THE HAIR

Rural women generally wear their hair in two braids. They normally comb and braid the hair on a daily basis. To keep the braids always out of the way, these are attached together with a piece of woven wool yarn known as a thullma. The combing ritual is conducted as follows. First, the braids are lifted over the head and dropped in front. Using only one hand for each braid, they are unraveled completely, with the thullma removed in the process. Next, the hair is smoothed with the fingers and then patted with water from a gourd until damp. All the hair is then combed forward, covering the face. The hair is then parted in half--using the comb--from the forehead to the nape of the neck, and each clump combed smmoth with the help of more water. The hair of one side is now divided into three equal strands and the braiding begun. When each braid is half-complete, the thullma is inserted and woven into the braid. About five centimeters from the end the braid is secured with a knot. The same procedure is conducted with the second braid. When complete, the two braids are lifted over the head and placed out of the way once again on the back.



Hair With A Thullma

Not all braids worn by rural women are their own. False braids are now widely used, particularly by younger women. In 1981 a pair of these braids could be purchased from 200-600 pesos (US$8-24), the price depending on thickness and length.

MENDING CLOTHES

Another activity closely associated with washing clothes is that of sewing and mending them. Since the housewife washes each garment by hand and later stretches it to dry, she is immediately aware whenever it is in need of repair. And since family members have so few sets of clothes to begin with, their repair must be undertaken and concluded soon after they have been washed and dried.

Small holes in a garment are simply sewn shut using a needle and thread. Larger holes must be repaired with patches. It is not uncommon to find clothing where patches are in turn repaird with a second patch--one on top of the other--or garments that have been patched so many times the total area in patches exceeds the area of original cloth. Far from a joking matter, these observations are made to dramatize the inability of most rural households to replace old clothing with new as well as the intensity with which the clothing itself is used.

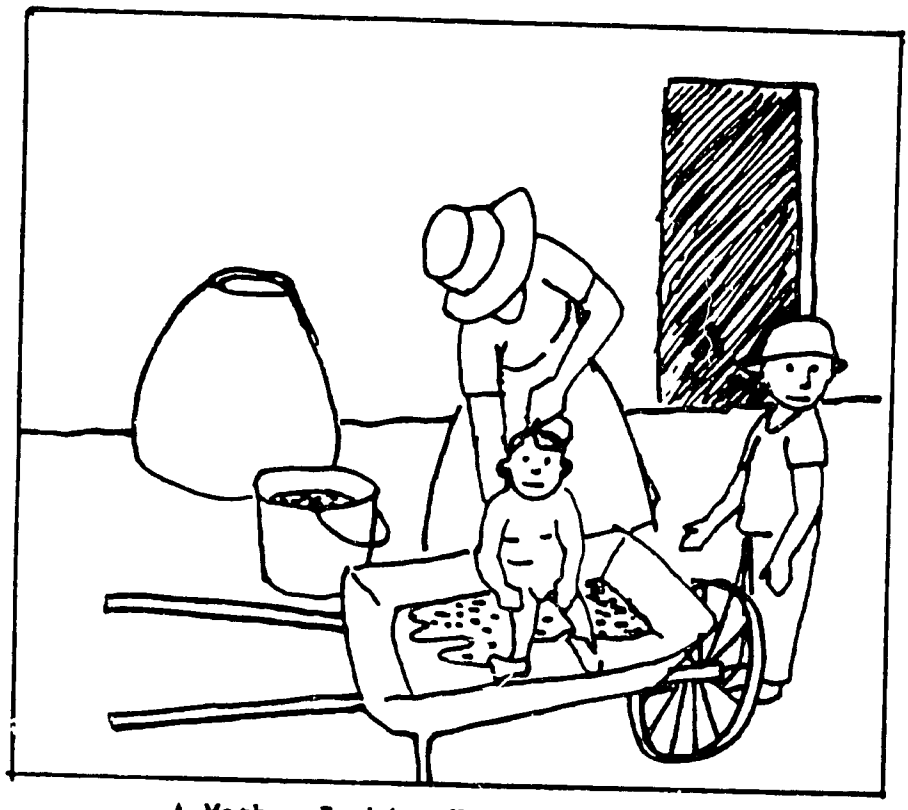
When speaking of mending clothes, it is often that a rural mother speaks of the activity as "curing" a particular garment, as if it were seriously ill. The word is indeed appropriate. It emphasizes the utter seriousness of clothing repairs as a subsistence necessity.

SWEEPING THE HOUSE

Sweeping the inside and patio of the farmhouse is usually a daily task of the female head of household or her daughters, if any. However, in times of intense agricultural labor, sweeping may be postponed until late in the day or even for several days. The task itself is performed with a whisk broom. Although the tool forces the sweeper to stoop completely, rural women in the Valleys region are totally accustomed to working this way and would no sooner use a long-handled broom than they would choose to cook standing up. Normally, sweeping begins with the kitchen. All debris on the patio is then swept from the outside toward the center, where it is collected in a shovel and tossed away a short distance from the farmhouse. Before the inside of the farmhouse is swept, it is first necessary to take care of the beds and bedding. Blankets must be folded, mattresses and cots doubled, sheep

skins removed from the ground. Once the floor has been cleared, it can then be swept.

There exist a few families who believe that a house should not be swept on mondays or fridays, because sweeping on those days causes bad luck and no money will come to the household. But as one woman from Huayculf expressed it, "Maybe that's why we're poor, sweeping every day. But I would rather be clean and ruined rather than dirty but rich." He further explained that when a house is not swept daily, the rats invade the place. Then come the fleas, and the mange, and the spiders. For people who must sleep on the ground, a well-swept house is therefore much more than a preference; it becomes the principal means of environmental sanitation available to the farm family.



A Mother Bathing Her Child

TRADITIONAL AILMENTS

Despite the gradual expansion of modern health services and drugs in the Valleys region, rural people still cling doggedly to their traditional beliefs regarding the narrow causal relationship between illness and natural or supernatural phenomena. Among natural causes of poor health can be found strong wind, rain, frost, lightning, mist, and many plants and animals. Supernatural phenomena include evil spirits, curses, forbidden places, violations of the laws of the Earth Mother, neglect of rirual sacrifices, punishment by saints, and others. The strong belief in such causes virtually guarantees a continuing demand for yatiris, jampiris, or curanderos (different names by which rural people identify their traditional healers). Indeed, even if doctors charged the same for their services, this would not stop many farm households from continued use of curanderos. In essence, rural people believe there are two different kinds of ailments: those best treated by doctors, and those that can only be cured by traditional healers. From the farmer's point of view, there exist certain maladies that doctors are simply unable to identify and treat; to consult them about such ailments is therefore a waste of time and money.

DIAGNOSING THE AILMENTS

If the patient or his family is unable to determine the cause of a particular ailment, the first step is to consult the traditional healer for a diagnosis. There are two popular methods of traditional diagnosis: interpreting coca leaves or millu. In the first instance the healer takes a handful of coca leaves, and from a kneeling position lets the leaves fall from his outstretched hand onto a blanket. The pattern created by the fallen leaves, as well as on which side the lie (shiny topside or dull underside), gives the healer the clues he requires to conduct his diagnosis.

In the second method, millu (rocksalt) is rubbed over the patient's body. If there is an area of swelling or abnormal pain, the millu rubbing is concentrated at this spot. After the rubbing is complete the millu is heated in a clay oven and melted. The shapes taken by the melted rocksalt gives the healer the necessary clues for reaching a final determination. Some healers also use spanish cards or read the patient's urine for further guidance.In still another variation of technique, a guinea pig is rubbed with millu and then the animal rubbed all over the patient to "adsorb" his sickness. Later, when the guinea pig is butchered, the carcass or internal organs will display discolorations corresponding to the location of the malady in the patient.

However, these procedures are often mere rituals to confirm or legitimate insights already formed in the mind of the healer. Because the curandero's first activity is to establish a dialogue with the patient or members of his family to learn all he can about the circumstances surrounding the illness itself--where it happened, how long ago, what symptoms, etc. With such information the healer forms a deduction which in part is based on analogy to similar situations with other patients.

Not all healers are capable of diagnosis. In fact, in many rural communities there exist one or more individuals who only specialize in diagnosis --in reading coca leaves or millu--and then refer patients to healers or to doctors. Among healers themselves, some are regarded as specialists in certain cures and not others; similarly some have better reputations than others--just like doctors. The diviner is sometimes consulted not just to determine the cause and preferable treatment for an illness, but to advise the patient's family whether or not they should continue to invest in further treatment of a very serious condition. If further treatment is considered futile, the family will be advised to save its money for funeral expenses.

SAYANKU

ORIGIN: In other regions of Bolivia this ailment is variously known as Gloria, Rayu Chayaska, Tatanchejpa Samaynin, and other names. Its cause is attributed to the afflicted person having walked over a spot which has been struck with lightning. The belief is that when lightning strikes an object it deposits or buries a substance like a meteorite. When a person passes over this location, the remains enter the body and begin to cause any of a variety of discomforts. For this reason, a tree struck by lightning should never be cut down but must be allowed to fall by itself.

SYMPTOMS: Sayanku or "lightning sickness" is initially detected by a general body fatigue, loss of energy, and eventually pain that is focused in a particular body extremity or internal organ. Sometimes the discomfort resembles rheumatism or a partial paralysis of the effected area.

CURE: Given the seriousness of the ailment, it is generally recommended that the patient conduct an exchange, bar[illegible], or convido (offering) to placate the fury of the earth. Usually an animal must be sacrificed--particularly one with special characteristics--like a black chicken or sheep. The sacrifice must be conducted at midnight and requires the cooperation of several brave companions. Accompanied by the healer, the group roasts and consumes the animal but without salt, then burn the bones along with a mesa negra (black burnt offering) containing packaged ingredients such as a dried animal fetus, khoa (aromatic herb, greased), incense, diverse alcoholic beverages, wool yarn of different colors, and other ingredients

known only by the curandero. At the time the bones and offering are burnt, the healer and his companions admonish the spirits of local mountain peaks, offer prayers to the Virgin and certain saints, and ask the forgiveness of the Earth Mother.

SAJRA WAIRA

ORIGIN: Sajra waira or "evil wind" is an illness widely feared among the Aymara and Quechua cultures. It is attributed to very strong winds, or to occasional whirlwinds that appear from nowhere, or to winds occuring early in the morning. The victim may be caught after dark, far from the farmhouse, perhaps conducting an irrigation or looking for stray livestock. If the victim is walking around on an empty stomach, and the wind catches him at that moment, the wind sickness will stick to his body.

SYMPTOMS: The illness generally attacks facial features. It can cause deafness resulting from a permanent windy noise in the inner ear, accompanied by ear ache. Other times the eyes appear to be half-paralyzed, or the mouth twists down (even as far as the neck) causing facial swelling that impedes speech.

CURE: Wind sickness is treated in a variety of ways. One of the most common cures is steaming the face with a concoction of boiling water and molle leaves; the leaves are also rubbed gently against the effected area until it returns to normal. The patient is also made to drink a tea made from ruda (rue), an herb considered to be an amulet against evil wind. It is said that bronze objects also cure the illness. The bronze is heated by friction with the hands and then rubbed against the effected part. Another amulet against evil wind is the antler of the taruga (deer), which also is used for rubbing. Finally, there are those who insist the best cure is to ask a Catholic priest to pass the holy chalice back and forth against the afflicted area.

A son of Demecio Rosales and Emilia Claros of Puca Pu[illegible] has reputedly suffered from wind sickness for many years. Now aged 12, the child experiences frequent dizziness and fainting spells. After several unsuccessful cures by the family, the healer was consulted. He conducted a ritual burn offering and constructed two crosses of palm fronds, one on each side of the door of the house, to scare away the evil, but this cure failed to have any effect. Today, every time the child faints, a member of his family rubs his forehead with alcohol and with this he immediately recovers consciousness; it is the only treatment which has had any effect on the problem.

PACHAMAMASKA

ORIGIN: Pachamamaska is an illness based on an unpaid debt to Pachamama, the Earth Mother. In rural areas the relationship between man and the earth is of divine origin. The space occupied by one's home is regarded as subject to rent or payment of tribute to the deity. When a family completes the construction of a new home, the first act must be to make the corpaicha (earth food) offering, which will allow the household to live in peace. If not paid, the earth will continue to demand its tribute--perhaps causing the death of livestock or even a member of the family.

SYMPTOMS: There is little uniformity in the symptoms for pachamamaska. In the case of children, the body takes on a deep redish coloration as if badly bruised; the child also becomes rickety and weak. Among adults, the ailment is often characterized by a general loss of energy, by skin discolorations in different parts of the body, and in some instances by hematomas and welts that refuse to heal.

CURE: Pachamamaska is treated much like lightning sickness in that it requires the services of a curandero and the making of a convido (sacrifice) to placate the Earth Mother. Depending on the healer's appraisal of the severity of the case, a chicken or sheep (or goat) must be sacrificed. It is also necessary to keep always in the house the holy palms received on Palm Sunday. After such attentions the victim can expect to experience a gradual recovery, as if the earth itself was slowly returning him to health. Nonetheless, there sometimes occur very serious cases where no cure is possible. In such instances it is believed that the house was constructed at an evil location, perhaps a spot struck by lightning. The only remedy is therefore to abandon the dwelling and build a new one elsewhere.

MARA

ORIGIN: Mara is a skin rash. It is caused by the victim having walked too close to a forbidden or haunted place. Such danger zones exist in many parts of the countryside. They can be special trees, rocks, springs, ponds, and so on; they should be carefully avoided because they are known as the dwelling place of mara.

SYMPTOMS: The illness of mara is initially manifested by a skin rash, but it will erupt only at certain hours of the day--as if it were caused by an alergy. Left untreated, the rash becomes continuous and impossible to irradicate with home remedies. The itching becomes intolerable.

CURE: Mara is treated by buying some special medicinal herbs that are sold in markets by the khapachekar (retailers of medicinal substances, for home remedies). Other materials for curing mara include the branches of molle or jarka. These are heated in warm ashes and then rubbed against the skin area afflicted with mara; the sticks are then thrown away at some distance from the farmhouse, in the direction of the sunset. Another belief is that mara can be cured or alleviated by a temporary change of clothes with someone of the opposite sex. A woman should put on a man's shirt; a man can wear a woman's blouse or shawl.

Valentina Ortuño of Huayculf reports that she cured her husband's case of mara in the following way. First she had him bathe in molle water. Then he was given a rub-down with huira khoa (grease soaked aromatic plant used in burnt offerings). Finally the patient was wrapped in a sheet and put to bed. The treatment had to be repeated two more times, after which the mara completely disappeared. Valentina explains that some people are much more susceptible to the illness than others; just by walking past a forbidden place at the wrong moment they can become infected with mara--it simply takes over the body. For this sickness baths are always advisable, in Valentina's opinion, because it permits a washing away of the evil.

ACHAQUES

ORIGIN: In the Puca Puca region there exist many anthills. They are built by ch'akas (black ants) in the middle of crop lots. The sickness is quite similar to pachamamaska or merely another manifestation of the same ailment. It is contracted when one tries to dig up or destroy an anthill, and accidently comes in contact with some evil that emanates from the ground.

SYMPTOMS: The sickness is characterized by a swelling of the feet, hands, or face. There is a slow rise in body temperature that in some cases may reach a fever. Sometimes little bags of liquid form just under the skin in the swollen area; they eventually erupt and leave sores.

CURE: The patient must be cured through the services of a curandero, exchanging in sacrifice the life of an animal for the restoration of the patient's health. To remove the illness from the body, the animal--usually a guinea pig--is rubbed with millu (rocksalt); the animal is then rubbed all over the body of the patient; it becomes the new recipient of the sickness by adsorbing the ailment into its own body.

The son of Miguelina Gonzales and Cirilo Macías of Puca Puca came down with achaque. The child's body ached all over, he had a temperature, and his skin broke out in a rash. "This is what happens when children play with anthills", says Miguelina, "They say doctors do not know how to treat it, but I do". She bathed the child with perganmanato (an unexplained medicine). Then, she rubbed his body with millu, which she burnt in a dish with incense and coca leaves. She called the spirit of her son, calling his name and allowing the burning incense to smoke over his body and throughout the house. This was done at night, when there was a complete silence.

In Huayculí, Valentina Ortuño's son also played with an anthill and came down with swelling all over his body. He ran a fever and lost his appetite. Valentina rubbed the child's body with millu, burnt incense and khoa, and finally went and dumped all the ingredients on the road leaving the village so the evil would depart and move far away. This practice of dropping the sickness far from the farmhouse is known as phiskura.

MANCHARISKHA

ORIGIN: Manchariskha or "fright" is an ailment that is very common among young children. During periods of heavy agricultural labor, a mother will frequently leave a small child at home under the supervision of an older sibling and perhaps the family watch dog. The sudden bark of the dog can cause a sleeping child to awake in terror; or the absence of the mother can cause it great panic; attempts by siblings to calm the child may only make the fright even worse. Such an experience can cause an emotional disequalibrium that may result in general discomfort, loss of appetite, continuous crying, and other symptoms that rural families generally define as the fright sickness.

SYMPTOMS: One major symptom of manchariskha is loss of appetite. If the child is lactating, he may refuse to nurse. Older children display a kind of lethargy or depression. They appear indifferent, do not feel like playing, and display a complete lack of energy. A child with fright sickness usually cries constantly, but with no apparent justification. When asleep the child jerks involuntarily, as if some torment was raging inside his body. Also, the eyes roll continually, as if following some pre-established trajectory. It bears mentioning that manchariskha also occurs now and then with older children, who perhaps are frightened at play by a dog or a snake.

CURE: When a child suffers from manchariskha, the belief is that his ánimo or spirit has been frightened out of the body. There is a series of treatment procedures beginning with a simple cure followed by progresively more elaborate measures.

To start with, the parents attempt the cure alone. At daybreak, before the child has had breakfast, his body is given a complete massage. Then a cross made of two pieces of sunchu wood is placed on the child's forehead and his name called in a loud voice several times. Between callings the parents say different prayers.

If the first attempt is unsuccessful, the mother attempts the cure the evening of the same day. She takes an article of the child's clothing, a piece of bread, and goes outside of the house to burn incense and call the spirit back inside. This must be done in total silence. There can not be heard so much as the bark of a dog. Should this happen the cure must be repeated the following evening. And only then, if the child continues with manchariskha, it is necessary to obtain the services of the curandero.

At this stage it is very important to know exactly where the fright took place. To obtain this information the parents will perhaps consult a coca kjawiri (one who reads coca leaves), because the leaves are always supposed to indicate the correct location. Later, both parents accompany the curandero to this spot at midnight. The ritual begins with libations to the Earth Mother—with chicha, grape brandy, and cane alcohol. An article of the child's clothing is smoked with incense and then wrapped--together with a knife and a machete--inside an aguayo (cargo mantle). A burnt offering is conducted. One parent carries a bell, the other a whip, with the curandero in the middle carrying the smoking incense and calling the child's name. The three slowly return to the farmhouse alternately ringing the bell, calling the name, and cracking the whip. They enter the house one at a time. Each embraces the child saying: "Here, I have brought back your spirit". The child is made to put on the incense-covered clothes and put to bed.

The curing of manchariskha by the parents alone seldom costs much--perhaps 10 pesos worth of incense or other materials. The first calling by a curandero--if used at sunset or sunrise--is only 20-30 pesos (US$0.80 -1.20). However, a curing at midnight--once the ailment has become a dire emergency--costs 200-300 pesos (US$8-12) for a local healer, and if brought in from outside the community the cost can exceed 1,000 pesos (US$40). In some cases children have been known to go crazy from the illness, or have been left retarded.

KARISIRISKHA

ORIGIN: This sickness results from an attack by the karisiri, a personage who sucks the grease of living creatures, just like a vampire who sucks blood. Some people believe that a karisiri is usually a priest or a nun who roams lonely roads in search of human grease for their evangelical rituals. Upon encountering his victim, the karisiri puts him to sleep with a spell and then sucks on one flank to remove the grease.

SYMPTOMS: A person suffering from karisiriskha experiences generalized loss of energy and appetite together with a fever. Slowly he loses the desire to live. Even if cured, the victim no longer will be able to participate in strenuous physical labor. Without a cure, the victim grows progressively weaker and eventually dies. It is said that the wound where the victim is bitten will never heal; however, neither will the wound display loss of blood or any other liquid. The sickness is widely feared throughout rural areas of the Valleys region.

CURE: Most believers in this sickness claim that it can not be cured. The only chance for treatment is to find a famous and powerful healer called a paco who has a pact with the Devil and is capable of conjuring the most magical spells. Among rural people there exists considerable discrepancy of opinion about the sickness. Some deny its existence while others not only believe but assert they themselves were attacked by the karisiri and survived thanks to a miraculous cure. The most dangerous season for running into a karisiri is between Easter and Penticost (May 25).

HURIFA

Hurifa is a sickness that occurs in newborns. It is characterized by lack of appetite, diarrhea, vomiting, and continuous crying. The sickness is believed to be caused when the mother--while still pregnant--smells a bad odor of putrifaction. The sickness can also be caused when a mother visits a cementery or participates in a wake for a dead person. The sight of a dead person is supposed to be very dangerous for newborns. As the sickness continues, the baby dehydrates, its skin wrinkles and turns grey or black like chuño (dehydrated potatoes). The traditional remedy for huifa is to bathe the child in khoa water (water in which khoa branches have been boiled) or make him swallow a few drops of creolina (a pungent, liquid disinfectant).

INTERVIEW WITH A TRADITIONAL HEALER

Andrea Alvarez of Huayculí is a curandera (traditional healer) as well as a partera (midwife). A single mother of two teenage sons, Andrea also supports her family by making and selling pottery. She enjoys a very good local reputation for her diagnostic and curative skills. Her method of diagnosis is based on the interpretation of millu (rocksalt). This material is rubbed all over the patient's body, particularly where any pain is located, then heated in a ceramic oven, and its melted shapes inspected for clues as to the cause or nature of the malady. Andrea's cures are mostly based on massage, calling the patient's spirit, and very inexpensive materials or natural medicines. Not inclined to narrowly controling her hours, she will often spend an entire night attending a childbirth or attempting a cure; yet she charges her patients very modest fees for the time and services she provides. By nature she is a humane and generous person, a fact some patients will exploit to reduce the already-low payments she requests for her assistance.

The following interview was conducted by Marina Ortuño on September 16, 1981.

MARINA: Doña Andrea, I would like to ask you some questions about your work. Please, can you tell me how long you have been diagnosing and curing people, and how did you learn to do this?

ANDREA: It has been...(answer deleted). I don't want outsiders to know about it, because a healer from nearby Pujyumi was almost arrested recently. They said he didn't know how to cure people because he had never studied; that all he did was make people even sicker than before; that a woman he had treated died later in the hospital. So many charges were made against the poor man! But of course nobody said anything about the doctor who treated her. How people are complaining about doctors! They charge so much money, and their fee is collected even if their cure fails. They say that in Cliza a childbirth now costs 1,800 pesos (US$72), and on top of that the cost of the drugs. If the patient recovers, fine; if not, the services cost the same. At least with us healers, whenever our cures fail we are too embarassed to ask for our payment. Inspite of that we are criticized for our lack of studies.

But God helps the poor. I just began curing people. I have no idea how I acquired this knowledge. I treat all kinds of illness. Many people are now coming to me, because a cure for which a doctor may charge 800, 1,000, or 1,500 pesos, I will do it for 20 or 30 pesos. Still, some people can be really inconsiderate. Sometimes I charge 200 pesos for a delivery, but the family only wants to pay me 50 pesos. How is that possible, when I have spent the whole night without sleep to care for the mother? Or sometimes after a night like that, and they haven't fed me, I'm weak from hunger and fatigue; so I ask them to prepare me some eggs...and then they want to charge me 5 pesos for each egg I've eaten. How can they ask such a thing! It makes me so angry that I refuse helping them again. When they ask for assistance I tell them I don't know how. How can they refuse to pay me a mere 20 pesos when--God being so good--my patients recover with a mere phiscura (massage) or a kohada (burnt offering).

I had an aunt who was a curandera. She also had problems with a physician. But I've been lucky. Up to now I've had no problems.

MARINA: How did you first learn to cure, Doña Andrea? Do you remember the first time you did it?

ANDREA: The first cure was with a baby. I just massaged it like I had seen a healer do. The baby recovered, and I continued my healings with massages and rubbing. I don't know how to read coca leaves. But in the millu the illnesses can be seen perfectly, and with that I know how I must cure the patient. Everybody seeks me out. I'm very well known around here. I don't charge much.

MARINA: What medicines did you use the first time you cured?

ANDREA: Only two small sticks of sunchu. I made a cross to call the patient's spirit; this always makes it return. At first I was ignorant of such things, but little by little I kept watching my aunt and I learned with my eyes only--and God's help. I have continued curing ever since. Being a single woman I have had to work on my own, with nobody to help me raise my sons. But now they are young men; they help me with everything. They buy their clothes with their own earnings.

MARINA: Does a fright (manchariska) also show up in the millu?

ANDREA: It shows up too. But I detect it in the eyes...even the color changes. The color of illness is different. I can always tell. Babies who've been frightened have caldu ñahuis (glassy, teary eyes). They become very restless. They don't want to be left alone either day or night. They can't sleep for very long. They jerk in their sleep as if they had been frightened by a noise. It never fails. Children like this are suffering from manchariska.

MARINA: When its a childbirth, Doña Andrea, how do you know when the moment has come for the birth to begin?

ANDREA: That too is easy. I take the mothers pulse. If its rapid that means the baby will be born soon; if the pulse is quiet that means the baby will be born still the following day. If I want to quicken the birth, I have the family buy a pill in the pharmacy; it's called pujante. This hastens the birth, but if I want to slow it down I make the mother drink a dark beer with a beaten egg. For the same results, the nurses in the hospital give the mother injections which cost a lot of money. This is what makes the doctors so mad at us: we charge so little to deliver babies. They also want to operate all the time, perhaps so they can charge even more. Not me. By rubbing and massaging the mother I induce the birth easily, it doesn't hurt her so much, and the next day they are sitting up in bed tranquil as you please. The stronger ones even get up and walk around the day after their baby is born; the mother too can help to heal herself.

MARINA: Do you know how to do the manteada (tossing the pregnant mother gently in a blanket) to facilitate childbirth? How is it done?

ANDREA: I don't use this myself. Other healers conduct the manteada with a phullu (blanket). The mother lies down, they lift her from both ends, and they shake her on one side or another depending on where the fetus needs to be nudged along. They know what to do. Sometimes they even yell at the poor mother; it's supposed to be very effective. But I don't do these things. I just massage, pushing firmly from above with both hands (from behind the mother, who is squatting or kneeling on the ground). It's no good in a bed. It's not firm enough and it moves too much. Shortly after I finish my massage the birth occurs. The childbirths I attend do not involve much pain. That's probably why so many families ask for my assistance.

MARINA: The calling of spirits, Doña Andrea, how is that done?

ANDREA: The llamadas (callings) should be done just at sunrise or better just at sunset. That's a good hour; a llamada then never fails. I prepare the coals in a clay oven (kanalla). Then I construct a little cross from sunchu branches. I take some piece of clothing belonging to the patient--something they use frequently--and I go outside and throw the incense into the coals. This creates plenty of smoke and a good odor. Incense is always used to call a spirit. They say souls like incense more than anything else. This is why it will always attract a spirit. Taking the oven with the coals I begin to call the spirit: "Jampuy ánimo, jampuy". I keep repeating its name as I approach the house, enter, and finally reach the bed of the patient. I pass the cross over the patient's head and I pass the smoke of the burning incense all over the body. I leave the cross underneath the pillow.

I blow three times on the patient's brow and then leave him alone. He must remain in bed until the following day.

MARINA: When will you be curing another case of manchariskha? I would love to watch how it's done.

ANDREA: You can't watch. The llamadas must be made alone and in complete silence. When somebody is watching it doesn't work. The spirit gets upset and doesn't dare return to the body. Other cures you can watch, but its always better when there are no observers. The same with millu. If there is someone else observing, or if the patient himself looks, the millu does not reveal its message clearly. The very best cures are always done with the patient and the healer alone.

INTERVIEW WITH THE MOTHER OF A SICK CHILD

In September 1981 the eight-year-old son of Margarita Espinosa and Leoncio Trujillo was seriously ill with a swollen knee. Despite repeated treatment by a doctor and a curandero, the child's condition did not improve. The knee was so swollen the child was unable to walk; he was confined to bed and cried constantly from the pain. Margarita was visited on three separate occasions over a period of six weeks by Marina Ortuño, who was anxious to document improvement in the child's condition. The interviews are of special interest because they provide insight into health practices and attitudes in a progressive rural community--Melga--whose families have convenient access to a clinic, a resident nurse, and a doctor in the neighboring market town of Sacaba.

MARINA: (She unwraps the blanket covering the child and finds the knee covered with a poultice (cataplasma) made of corn flour and beaten egg white, which is wrapped in place with a piece of cloth). Margarita, how did your son get this ugly swelling?

MARGARITA: I don't know. It just started a week ago. Now he's unable to walk. Because of the pain he's lost his appetite, he can't sleep at night, he dozes for brief periods during the day....What am I going to do for my poor son! Three days in a row I took him to see the doctor in Sacaba. They gave him shots, they gave him some pills to take, and each day he has been taking them too but with no result. Poor boy, I believe he's going to die. He won't eat. I also took him to see the curandero. The healer told me my son had been snatched by the Pachamama and his spirit frightened off, and that it would be necessary to call the spirit and burn incense (sahumear). We did that yesterday, we will do it again this evening and see what happens. I have treated the swelling with a plaster of corn and egg. To this I added some incense that I ground up very fine. It looks like this may have calmed and refreshed him a bit, but I'm still very worried. He can still hardly move. What will I do! He has to get better or he'll die. All night long I hold him in my arms and he just cries and cries. He was such a strong little man before. He helped me catch and tie up the animals, he took care of his younger brother. Such a help he was to me! It makes me so sad.

MARINA: In the poultice, why did you put incence? Isn't that what you burn to call the spirit?

MARGARITA: When it's the Pachamama they say its good to use incense because this is what the Virgin likes. That's what I've been told, who knows whether it will help or not? I'm so worried from thinking so much about it that I hardly feel like eating. All day long I stay home to take care of him. I do nothing else. I can't help my husband at all. It's now time to irrigate the miskha potatatoes. The animals need looking after. There's so much to be done her in the country and I can't do anything. Where would I take my son? This evening we'll call his spirit again--using his clothing this time to see if that helps.

MARINA: How do you call your son when he has been frightened (manchariska)? Can you explain how you do it, please?

MARGARITA: First, I prepare the coals in a kanalla (piece of broken pottery), but last night I used a tin can. Then, I take his shirt and some other clothing, and also a breadroll, and while holding all this I throw the incense over the coals. It smokes and gives off a strong odor. Carrying this I go out behind the house to the road and I start calling his name in a loud voice, like this: "Papilo, jampuy animo, Papilo jampuy. Don't be scared, come my little son." That's how I have to call him. Because they say his little spirit is resentful, so you have to call it back real gently. Who knows? Then I slowly return to the house and I go to my son and I put the clothing and the bread underneath his bedding. Then I gently blow three times on his forehead and leave him so he'll sleep. Last night I called his spirit at 8 P.M. It should always be done at night, when everything is silent. Sometimes the dog will bark; that ruins it. The spirit has to be called all over again. Sometimes some neighbors may pass by and that too causes the calling to fail. It's always better when there is complete silence.

MARINA: What do you think works better: the spirit callings or the injections by the doctor?

MARGARITA: Either one will work. But to get a quick cure I tried both. Sometimes the coca leaves indicate Pachamama; that can't be cured by a doctor, it always has to be with spirit callings. The coca will say whether the ailment is for a doctor or a curandero to treat. The leaves never lie. Sometimes the healer tells us: "Why should I do you a disservice. Take the patient to a doctor." But this time the coca said it was the Pachamama, and that my son was frightened right here beside the house.

MARINA:Did you see how the curandero read the leaves? Tell me, what did he do?

MARGARITA: Well, I bought some coca in Sacaba and I wrapped it in a napkin. From here I took it to the curandero's house. He was waiting for me. He had me enter his room. I sat on the ground. I asked him to look into the coca leaves concerning my son, then I gave him the coca. He crumbled the coca in

the napkin. Then he put a phullu (blanket) on the ground. He told me I had to pay him 20 pesos (US$0.80) to read the leaves. He kneeled, removed his hat, and then holding his right hand high above his head he released a handful of coca. According to where the leaves landed, he said my son was sick, that the Pachamama grabbed him and that was why his knee was swollen, and besides that he had been frightened. The healer read the leaves three times and each time it was the same. So he told me it was urgent to call his spirit and burn incense. He also told me to use this plaster of corn flour and egg. We'll know tomorrow if it does any good. Oh I hope so. I'm going crazy worrying about him. I haven't swept my house, I've hardly done any cooking--only boiled potatoes, perhaps a piece of meat on the days I've taken him to Sacaba, or my sisters have helped with meals...You see, even now he's calling me. I spend the whole day holding him...

MARINA: (A week later) How is your son doing, Margarita? I suppose he's all right.

MARGARITA: He's calmed down a little, but he's still in bed. There he is. We have just returned from Sacaba after visiting the doctor. I just don't know how we're going to cure him. The doctor says it will take some time, that we must be patient, but I can't go on like this taking care of him when there are so many other matters to attend to.

MARINA: Whose cure is working better: the doctor's or the curandero's?

MARGARITA: I frankly don't know. The flour and egg seems to have helped. But out of desperation I take him to the doctor every day, and every night we call his spirit. My husband says we have to do both; that it doesn't matter who cures the child; that it doesn't matter he must work without being well fed. The only thing that matters is that he is our son. "Take care of my son", he says, and so I take care of him all day long.

MARINA: What does the curandero say about your going to see the doctor? Doesn't it annoy him?

MARGARITA: He doesn't know I'm seeing the doctor. It would upset him if I told him. The curanderos can be very resentful, and he might not help me on another occasion. But everybody goes to the doctor when the curandero can't cure them. He comes every time I call him. Sometimes we call the spirit together. I'm spending nearly all my money, but what else can I do? The prescriptions cost plenty, and for the curandero I have to buy grape brandy, wine, koha, incense...its all an expense. The money is gone in a flash. But as long as my son is cured it doesn't matter how much I spend.

MARINA: (A month later): At last I've found you at home, Margarita. How is your son. Is he cured?

MARGARITA: His condition is still delicate, but at least he can walk now. It has now been more than a month I've suffered with his situation.

MARINA: Who is treating your son?

MARGARITA: We're only using the doctor now. They give him shots and he takes these pills (disinflamant). With all this he's getting better, he sleeps well at night. There is still some swelling. Little by little he'll get better. I've had bad luck this year. First I got sick, then my youngest, then this one. What will come of us? I'm so tired, I don't want any more patients.

MARINA: And how about you? How were you cured?

MARGARITA: With me, the curandero said I had to go straight to the doctor. My tonsils were inflamed, the doctor said. I couln't even speak, and the fever bothered me day and night.

MARINA: When somebody's sick in your house, why don't you go to the clinic (in Melga) rather than to Sacaba to see the doctor?

MARGARITA: The nurse says the doctor should prescribe first; without that she won't treat anybody. So it's better for me to go straight to the doctor where they give me the prescription and cure me as well. Doña Yola is a very nice person, but...I don't use her. Once she gave me some pills for a headache, that's all.

MARINA: Do other people use the health post here in the community when they are sick?

MARGARITA: The adults don't go. I think mostly it is the babies who are taken there to be controlled for weight and height. Some people may go there to buy their pills; others have her give them shots--but only if she sees the prescription first. Every monday is a control day. That day the doctor comes with other nurses, and with this service it's rare for babies to get badly sick anymore. After weighing they tell us the baby needs to eat more to grow and they tell us what foods to prepare. They teach us how to prepare the bottle so it's real clean. They tell us not to use a bottle that fell on the ground because it can cause diarrhea. I'm being real careful with my youngest, just like they told me, but no matter how careful I am he still gets sick. The bottle is just not as good as the breast. Some of us have to use the bottle, though, and powdered milk.

TREATING A BROKEN ARM

In December 1981, while gathering water at the river, Vicenta Montaño of Puca Puca slipped and fractured her right arm. After receiving provisional first-aid--a splint made by her husband and son-in-law--Vicenta elected not to visit the nearest doctor in Aiquile; instead she traveled about 170 kilometers to consult a highly-recommended physician in the town of Cliza. In the following interview, conducted by Marina Ortuño on January 4, 1982--Vicenta tells the story of her treatment.

MARINA: Doña Vicenta, how long have you been with that fractured arm?

VICENTA: It's been three weeks that I've been like this. I can't do anything --I can't plant, I can't cook. This is the busiest time of the year and I'm completely useless. The doctor told me it will heal in two months, but that is a long time from now. It still hurts, especially at night. It's an ugly pain, like I was burning. How am I going to last two months? I'm going to turn lazy, and there won't be anyone to help my husband with the work. The weeds are growing now day after day. I try to help with the weeding but with only one hand I can't do much good. It's really tough having a broken hand.

MARINA: How did you know the bone was broken?

VICENTA: Right then after I fell I could hear that my bones were loose, and in Cliza the doctor told me it was broken, just by touching my arm. The day of the accident I was so angry with myself I cried. It hardly hurt at first. My husband and my son-in-law put some sticks on my arm and wrapped it up. That evening the pain was so bad I couldn't sleep, but I just had to suffer it as best I could. They told us I should go to Cliza for treatment because there's a doctor in that town who heals very well, and lots of people go there to see him about practically everything. In Aiquile the doctors do not cure very well, not like they should, and everyone suggested I go to Cliza. In travel costs and treatment I spent 2,000 pesos (US$80). I spent five days in Cliza, with my husband, and the doctor told me I should come back to see him but I didn't. Now I'm treating myself like I remember seeing the doctor do--actually he's not a doctor but more like a jampiri (traditional healer)--yet a lot of people consult him, from the city as well as the country.

MARINA: How did he treat you? What things did he do to you? Did he give you any medicine to take?

VICENTA: After he told me it was broken, he sent me to buy this (an elastic bandage) and these pills (disinfectant). I took them for a week but then I stopped when the pain began to subside. The doctor took me inside a room and there he prepared some chopped up tobacco which he mixed with egg white and sugar. This he spread on a piece of paper and wrapped it around my arm. He pulled on my arm and set the bone in its place. The pain almost killed me. He said it hurt so much because the break was cold; had he done it right after the accident it wouldn't have hurt so much. Then he wrapped me with the paper containing the tobacco and egg, making sure as he did so not to move the broken bone. Then he wrapped my arm with the elastic bandage.

He told me to change the dressing every three days. I waited for three days to see how I was going to remove it. When I took off the bandage the paper was completely stuck to my arm and I couldn't peel it away with my fingers. I finally got it off using a sharp knife. Then I cleaned my arm and I put on another dressing just like the first. I was supposed to go back and see the doctor but I came home. Here I've been changing the bandage every 3-4 days. It's healing just the same. I couldn't remain in Cliza because aside from the expense--for my husband as well as myself--we were mortified about planting. We had left right in the middle of plowing, the fields were ready to plant. In Cliza my husband couldn't sleep hardly, he hardly ate either, and all he could talk about was the work that had to be done. Waiting around in Cliza, with nothing to do, it's real difficult when you've suffered a misfortune like this. So I decided I would cure myself. It will take a month, maybe two; they say the older you are the longer the healing takes. So be it. It continues to hurt at night and the swelling is not yet completely gone.

MARINA: Aside from the dressing, what other precautions or medicine are you taking to cure yourself?

VICENTA: I'm not taking anything. For the first week I didn't eat any spicy sauce. I was drinking cinnamon tea with sugar, but not any more. I eat everything but still with very little picante (hot sauce) because they say it doesn't allow the cure to work. I'll just be careful, that's all. When the pain got too strong I had them buy me some pills at the pharmacy in Aiquile--here they are in this paper (Buscopina compound). This calmed the pain. Now I'm not taking anything.

MARINA: Do you really think you're going to heal with that dressing of tobacco and egg? Why don't you see a doctor again?

VICENTA: Everybody tells me, don't go because they don't know how to cure in Aiquile. Someone told me they were going to put me in a cast for a month. I think I'm just going to leave it like this. Now I'm really afraid that they'll hurt me again, like that doctor in Cliza, and perhaps all in vain. Don't go to Aiquile, they say. There they give you a cast and it makes you rot. They put it on and they forget about you until it rots. I'm afraid.

Little by little I think it's going to heal this way. I've stood it already for three weeks; it's partly cured already.

MARINA: Doña Vicenta, with this experience you've had, who do you think cures better, the doctor or the curandero?

VICENTA: Both know how to cure, each one does what he knows. The curandero was unable to cure my husband, but with the doctor he got well and he's still well. It's not in vain that they study. But now with this accident I feel useless. I can't do anything. Máxima (her oldest daughter) has to help me with everything. I can't do much with my left hand. What I can do is walk. But I miss my hand. I'll just have to have patience.

MARINA: Do you know of any other cures they use here in the community for broken bones? Perhaps you've heard something?

VICENTA: I haven't seen this, but my husband says that they cure broken bones with the blood of a black dog. Let me ask my husband (Pablo Balderrama)...

PABLO: Miss, I don't know the cure but I've heard that the fracture is cured with black dog's blood, egg white, and wheat flour, all well mixed together. They put this on a thin sheet of wood (papel de madera), not just any paper, and with this they wrap the fracture and tie it in place with a handkerchief (sling). This preparation dries very stiff, like a plaster. I think they leave this in place for three weeks or a month until it heals. It's very good.

MARINA: Knowing that dog's blood is so good, why didn't you cure your wife that way?

PABLO: I don't really know, perhaps it might not work. I would hate to make a mistake. It's always better to ask someone who knows. We were so worried we asked everybody what we ought to do, and what people mostly advised us was to take her to Cliza. We wrapped her with sticks, but that wouln't have cured her. Whether now she gets well or not depends on God.

CHILDBIRTH

PRE-NATAL PREPARATIONS

Women of Melga, Puca Puca, and Huayculí can expect to become pregnant about ten times during their child-bearing years. Most of these pregnancies result in spontaneous abortion or infant mortality. For many women, pregnancy and childbirth is a routine experience repeated at roughly two-year intervals. Birth control by artificial means is virtually unknown or ignored. About the only practice employed by women to discourage frequent pregnancy is to continue breast feeding their children beyond one year of age. For the average woman, family planning is strictly in God's hands or is simply a matter of luck.

The reality just described was dramatically summarized by a mother from Puca Puca in the following words: "With this one I've had 11 babies, and I'm still only 37 years old. Seven of my children are still living. God must know what He's doing. We can hardly support the seven we have; what would we have done with eleven! I guess it's always this way for the poor. Our children come like the rain. But rich families have only 2-3 children; even here those people have all the luck!"

When a rural mother's pregnancy approaches full term she still takes few special precautions. Women speak of attending weekly markets, baking bread, making chicha, washing clothes, and even getting drunk on chicha within a day of the commencement of labor pains. About the only birth-preparation activity mentioned by some (but not all) mothers was the huichada, the practice of gently tossing the expectant woman up and down on a blanket or poncho. This procedure is directed by a midwife and lasts for about 20-30 minutes. Its purpose is to settle the fetus into a position that will facilitate birth. Increasing numbers of women are also buying a pill known as a pujante ("pushing medicine") to accelerate the birth process.

Most rural mothers would never consider giving birth in the hospital except under conditions of severe complications. In the first place, they consider it too embarassing to be seen naked by strangers. Second, the hospital position of delivery--laying on one's back--is seen as a much more difficult and painful way of giving birth than the traditional squatting position. Third, hygenic practices are more rigorous in the hospital and contradict the traditional prescription of partial bathing only after a week and a full bath only after a month. Fourth, exposure to sunlight (upon leaving the hospital) within only a few days of childbirth violates a cardinal rule of prevailing custom regarding post-natal care. Many other object-

tions could be added to the list. Yet by far the most compelling argument why rural mothers shun hospital-assisted births is quite simply for reasons of expense. For the average rural household, the cost of a hospital delivery is considered prohibitive. And fully half the cost (not to consider the associated risk) is accountable not to the hospital services themselves, but to the expense of getting to the hospital in time using an ambulance or taxi service contracted on an emergency basis.

GIVING BIRTH

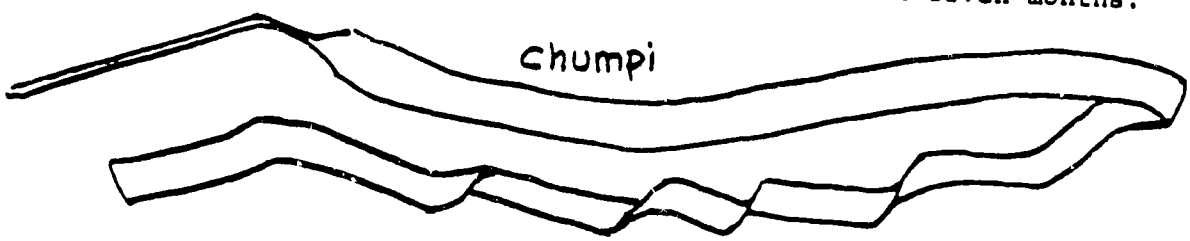
The rural mother almost always delivers her baby shukuska--in a squatting position. Usually she is accompanied by her husband, who squats facing her so that she can grab his shoulders. The midwife often facilitates the delivery with a general body massage, but with particular attention to the muscles of the lower back and abdomen--a procedure known as kakoda. The mother may be asked to drink a beverage intended to expel the baby; one such concoction consists of two beaten eggs mixed with wine.

The mother squats on top of a "bed" constructed on the ground. It usually consists of 4-5 sheepskins covered by several layers of old clothes, rags, or sacking material to adsorb the blood. As these materials become saturated, they are removed and thrown in a corner to be washed later; they are replaced with new (dry) materials.

The husband or the midwife receives the baby as it emerges. The umbilical cord is cut by either of these persons--usually using a pair of scissors. With water that has been heating on the stove the infant is thoroughly washed. Most babies are washed using laundry soap, or if available a toilet soap; the warm, soapy water is applied with a clump of wool. Talcum powder, if available, is applied to the infant's buttocks. Once clean, the baby is wrapped in swaddling clothes--a long and narrow strip of cloth known as a chumpi. The infant's head is wrapped in a triangular-shaped cloth known as the huma paño.

Meanwhile, the mother rests on her back in bed to await the expulsion of the afterbirth. If this does not occur within an hour, a variety of remedies may be attempted. The mother may be asked to drink beaten eggs. The general massage of her body may be resumed. In some cases a plaster or cataplasma is prepared and applied to the small of her back. An appropriate plaster recipe for facilitating expulsion of the afterbirth consists of ground khora (stems of a cactus) mixed with egg white and wheat flour. If the mother has received visitors, everyone but her husband or midwife may be ordered out of her house. This follows a traditional belief that retention of the placenta is often caused by the mother's embarassment. Once the placenta is removed, it is taken outside and thrown to the family dog. Free of the afterbirth, the mother too is tightly bound in a chumpi. This is done to prevent hemorrhage and also to keep her now-empty

womb from suffering some kind of tear or other injury. The material is wrapped and bound so tightly it resembles a cast. Many mothers wear it as long as six weeks following childbirth or an abortion. In one instance observed in Puca Puca, a woman wore her chumpi for over seven months.



POST-NATAL CARE

Following delivery, the mother is not supposed to wash herself in the abdominal area until after a week has passed. This custom is intended to reduce the risk of vaginal infection or pasmo. The mother is allowed to leave her bed after 2-3 days or as soon as she feels strong enough to do so. But she should not leave the house for 3-4 weeks. It is believed that exposure of the mother to direct sunlight during this period can cause her to hemorrhage. While the danger of sunlight is undoubtedly exaggerated, the injunction effectively keeps many new mothers from engaging in heavy outdoor tasks which can bring on a relapse. Only after about a month does traditional custom recommend the mother take a full bath. This will usually take place at a river, following the washing of a load of clothes. It normally signifies her complete recovery, but for this the woman is well-advised to wait for a warm, sunny day.

After her delivery the mother is put on a special diet of "wet" food such as soups and porridges. These should contain abundant meat, especially chicken or lamb. It is customary to prepare and serve these meals without hot spices--another substance believed to retard the healing process. For beverages the mother will mostly be served heavily-sweetened teas made from herbs or cinnamon. The drinking of chicha in moderate quantities is permitted; indeed, the beverage is considered a nutritional compliment and is believed to stimulate a more abundant supply of maternal milk.

The newborn infant is not breast-fed for 2-3 days following delivery. After one day the baby is made to swallow a little anise water or a spoonful of urine. If the baby is allowed to nurse on the second day it is only to receive the mother's colostrum, which is considered an excellent natural laxative for cleansing the newborn's stomach. As the mother's milk begins to flow freely by the third day, routine nursing of the infant begins.

From the day of its birth until six months of age, the infant will be bound in the chumpi--both arms and legs--most of the day and night. The binding will usually be removed only to change the baby's diaper or to give it a daily bath. During the next six months the infant will be wrapped in the chumpi only at night. After a year these swaddling clothes are finally removed completely. The practice of wrapping babies is based on the belief that it makes their bones stronger, and that as adults their bodies will able to carry heavier loads. A more immediate and practical advantage of swaddled infants is that they can be carried more easily on their mothers' backs.

Aside from the chumpi, the infant is fitted with two janantas or diapers: a smaller (inside) diaper and a larger (outside) one. These garments are changed three or more times a day. They are washed daily with soap and hung to dry in the sun, which helps to bleach the material. Alleging that soap causes rashes, some mothers wash their babies' diapers in water only and hang them to dry only in the shade.

Breast feeding practices are quite variable from one family and community to the next. Some mothers allow the baby to nurse whenever it wants, be it five or fifteen times a day; others try to place their infants on a nursing schedule that permits them greater freedom to conduct their household and field tasks. Babies are introduced to solid foods anytime after about 10-12 weeks of age. In Melga, some mothers attempt to wean nursing children as early as six months, others at 8-10 months. The weaning age in Huayculí is considered to be about one year, once the child begins to take its first steps or speak its first words. Although earlier weaning is also common, many mothers in Puca Puca continue to nurse their children until age 18 months; in this instance, late weaning is employed as a birth control measure. As long as she continues to nurse her child, the mother believes she can not get pregnant again.

The weaning technique employed usually depends on the persistence of the child. When taught to drink directly from a cup, some children begin to ignore the breast automatically. For persistent nursers, it is customary for the mother to coat her nipples with a hot sauce disagreeable to the child's taste. A paste made of ground romerillo (a condiment) is said to be quite effective. Some mothers paint ugly faces on their breasts--using charcoal or red dyes resembling blood--to discourage a nursing child. As a last resort, a family may just have to endure 2-3 days of nearly continuous wailing until the child is weaned.

Rural mothers from Melga, Huayculí, and Puca Puca are nearly unanimous in their conviction that breast feeding is clearly superior to bottle feeding. They believe, first of all, that the quality of maternal milk is greater than canned or powdered milk. Second, breast-fed infants are regarded as generally healthier and less prone to diarrhea. The most commonly-mentioned disadvantage of bottle feeding, however, is the logistical problem of boil-

ing water to sterilize bottles and nipples. Stories abound of mothers who have returned home exhausted from their work in the field, or who got drunk at a community festivity, and thereby failed to take adequate sanitary precautions--with fatal consequences for their bottle-fed infants. Of course, a final and possibly most important impediment to bottle feeding is simply its cost. In mid-1980 a single five-pound can of Nido (a popular powdered formula) sold for 170 pesos (US$6.80) at the Sacaba market. A single infant's requirements can be estimated at two cans per month, or 340 pesos (US$13.60) in total. This sum of money would be enough to finance nearly half of the average rural family's market purchases each month. It is also equivalent to the value of a single sheep (liva), or about 15 pounds of fresh meat. In this context, a single bottle-fed infant could require an investment capable of jeopardizing the diet of an entire rural household.

ACHES, PAINS, AND MINOR AILMENTS

Rural households are quite self-reliant in treating a wide variety of minor ailments. These include the common cold, hangover, cough, fever, stomachache, headache, diarrhea, toothache, strained muscles, and many others. Treatment is predominantly based on simple home remedies that require no cash expenditure. However, the very simple and least expensive commercial remedies--like aspirin, Alka Seltzer, and Desenfriol--are gaining wider acceptance.

COMMON COLD

Nobody escapes the peste or gripe, names commonly given to the ordinary cold; this ailment is one of the most frequently mentioned health problems in diaries kept by rural households. Sinforosa Claros of Puca Puca takes a remedy consisting of scrapings from rayo rumi (a special rock) mixed with sugar and boiling water. Another medicinal tea she makes with a herb called paspa. Felipa Beizaga's family, of Huayculf, prepares a medicinal tea made from tabardillo and a tablet of Desenfriol (commercial cold remedy). In cases of nasal congestion she prepares an inhalant made from boiling water and eucalyptus leaves. Braulia Soto (Puca Puca) explains that commercial cold remedies only work when combined with herbal teas like amor seco and hierba amarilla. Fidelia Beizaga uses Desenfriol, but she also bathes her patient's brow with urine and makes them swallow a drop of kerosine. She insists another effective cure is to take a cold water bath just before sunrise. In Melga, Juliana Olivera recommends a cargado. This remedy consists ofcinnamon tea with lemon, grape brandy, and an Alka Seltzer.

HANGOVER

There is an old saying that "one nail removes another". In Melga this adage is applied to a hangover remedy made with chicha. The beverage is put in a tutuma (gourd). Then a piece of metal is put in the fire and heated until it is red hot. The metal is immediately plunged into the chicha and whipped vigorously into a froth, then drunk warm. The remedy always cures a bad hangover, but as one housewife explains, this causes her husband to start drinking again just as soon as he feels better.

COUGH

Coughs are usually treated with herbal teas, and now and then with a commercial cough drop. Andrea Rojas of Melga cured herself of a cough by drinking eucalyptus tea. She explains that the leaves should not be boiled; instead, they are added to steaming hot water, then allowed to steep. Sugar is added and the tea--known as an infusión--drunk while still hot.

FEVER

Fever is treated with bathes and hot teas. Malva water is one bathing concoction. Another is warm urine applied to the forehead and sometimes the armpits or soles of the feet. A third is water in which peach pits have been boiled.

HEADACHE

Valentina Ortuño of Puca Puca cures headache with a tea made out of jaya pichana, the same plant used by rural families to make brooms. It has a spicy taste. Rayo rumi scrapings (see COMMON COLD) are also effective. When Felipa Beizaga has a headache she bathes her forehead in olala (cactus) water, then binds it tightly with a cloth. Florencia Alba of Huayculí uses Alka Seltzer on headaches.

Lucrecia Rojas of Melga tells the story of how she suffered constant headaches. She visited the doctor in Sacaba, took some pills he prescribed, and still the pain continued unabated. Upon consulting a local healer named Tata Eusebio, the coca leaves diagnosed her problem as resulting from having burnt out some ants she found in her kitchen. Lucrecia was instructed to conduct a burnt offering to the Pachamama at the very location she had destoyed the ants. The healer came and called her spirit as well.

STOMACHACHE

Manzanilla (chamomile) tea is the most common cure for mild stomach distress. Other medicinal teas for stomachache include paico, lluta kepu, and apacane sape (local varieties of cactus) in Puca Puca, and mate de coca in Melga. Additional remedies are employed when stomachache is accompanied by diarrhea.

DIARRHEA

This is one of the most common ailments in rural areas, particularly among children, and a wide variety of home remedies have been concocted to combat it. One is to boil hierba buena (a seasoning herb), then serve the water mixed with a beaten egg. Another remedy is to serve the patient a tea made of a cactus plant known as luta kepu. The water in which an avocado pit has been boiled is also considered effective. In Melga a popular remedy is to serve the patient rice water with cinnamon or mixed with burnt bread crumbs. A growing number of families resort to commercial diarrhea medicines and medical attention if their home remedies fail to arrest the ailment.

TOOTHACHE

Most toothaches end up with the extraction of the tooth itself. However, there are a number of traditional remedies for alleviating the pain and swelling. One approach is to apply a soothing material to the tooth itself: this may consist of salt, aspirin, Alka Seltzer, or clove--ingredients that are often mixed with toothpaste. The second approach is to wrap a plaster around the swollen area of the jaw or cheek. The most common plasters are made with egg and wheat flour. The egg white is beaten in a dish until creamy. To this is added the flour and mixed well to obtain a thick paste, which is then applied directly to the face and covered with a handkerchief. There are many other ingredients that can be used for plasters. These include soap, ground habas, tobacco, or linseed, quinua flour, and even mud. Now and then such remedies will be accompanied by a reading of coca leaves and the calling of the patient's spirit.

BACKACHE

Sprains, backaches, and other muscular discomforts are usually treated with a combination of massage and plasters. Massaging the pained area is called kokada. It is often conducted with rubbing alcohol or chicken grease. For muscular aches Felipa Veizaga of Puca Puca prescribes a tea made with horsehair. Jovita Rojas from Melga was limping for almost a year with acute pain in her hip. Both a doctor and a traditional healer failed to alleviate her condition. Finally, upon her second consultation with the curandero, he called her spirit using a whip; from that night on she gradually recovered.

TREATING CRACKED SKIN

One morning in August 1981 Fidelia Beizaga of Puca Puca was encountered seated on the ground treating her dry hands and feet, which cracked and bleeding. This is a common problem for people who walk barefoot or wear open sandles, particularly in the winter season. On this occasion Fidelia was rubbing the effected skin areas with a pomade called Mentizán. She said that in the absence of a commercial product, rural families usually treat dry skin with applications of pork lard or chicken grease. These materials are heated until they liquify. They are then applied to the skin with a feather. Once greased, the skin surface is allowed to dry, then covered with a piece of cloth.

TREATING A SWOLLEN FOOT

Vicenta Montaño's son was suffering from a swollen foot caused by a wound resulting from having stepped on a sliver. For three weeks neither mother or child had done anything about the wound; they expected it to heal by itself. Eventually the wound became so swollen the son was unable to walk, and at last a home remedy was attempted.

First she sent one of her children to the river to fetch the leaves of the romasa plant. Then she took down from the roof of her kitchen the can in which she soaks the bag of coagulant (lamb or kid stomach) that Vicenta uses to make cheese. Out of this can she removed a thick milky substance which she applied with her fingers to the swollen area of her son's foot. On top of this cream she placed 3-4 romasa leaves, covered them with a piece of cloth, and then tied the poultice in place with some wool yarn. Her son was now able to slip on his sandles and walk with a little more comfort than before.

The following day the pain had greatly subsided and the child was walking normally. Vicenta changed the poultice, observing that the swelling had subsided, and the skin was soft and white. That evening the abscess came to a head and broke. Vicenta removed all the pus but this time she did not replace the poultice. She explained that the leaves only help to suck out the swelling and pus; thereafter the poultice should be removed because it impedes the drying up of the wound. When she does not have romasa leaves, Vicenta said that she uses a plant called malva.

CHAPTER VII.

ARTISAN CRAFTS

This chapter begins with a section on the spinning and weaving of wool. Including the complimentary tasks of shearing and dyeing, spinning wool yarn is nearly a universal and daily activity of rural women in the Valleys Region. In contrast, weaving is mainly considered a masculine skill. But with the increasing availability of factory-made textiles, the number of specialized weavers is declining rapidly. To provide an example of their craft we describe the weaving of a blanket on the rustic footloom.

The middle section describes pottery-making in Huayculf. Rather than a productive artisan sideline, the production and sale of ceramics is the principal source of income for most households in the community. Covered are such topics as the preparation of clays, using the potters wheel, decorating with paints and enamels, baking the pottery, transport and marketing of ceramics, and examples of pottery production, costs, sales, and net income.

Sooner or later every rural family will build, expand, or repair its own dwelling. The concluding section of this chapter is therefore devoted to rural house construction. The making of bricks and rooftiles is described followed by a review of the different stages in building a dwelling using local materials. We end with a presentation of representative house plans from Puca Puca, Huayculf, and Melga.

SPINNING WOOL

Spinning wool is practically a daily activity of the rural woman in the Valleys Region. Unlike the Altiplano, where men are known to perform this work as well, spinning wool is considered exclusively women's work. As one mother of six from Melga put it: "If you don't spin wool, you're not a woman". Female children begin to acquire the necessary skills as early as 6-7 years of age, learning by observation and practice. And what they learn is not just the spinning itself but also the other necessary complimentary skills required to produce spun thread: shearing, combining threads, and dyeing. But interestingly enough, most rural women do not learn how to weave. This skill is left to specialized weavers who, in many cases, are men.

SHEARING

Depending on the community, sheep are sheared anywhere from June through December. If sheared once a year, the average sheep will yield about a pound of wool. The wool of a single animal is known as a bellón. For a more complete description of shearing, the reader should consult Chapter IV, Livestock Practices.

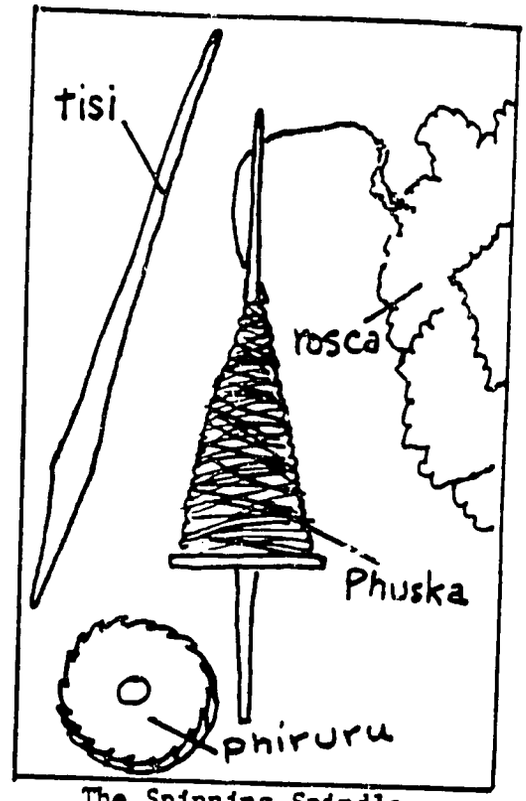
WASHING AND CARDING THE WOOL

In Puca Puca, wool is not washed until after it is spun. Women explain that spinning unwashed wool is easier to work with because it slides more easily through the fingers. In contrast, the women of Melga wash their newly-sheared wool before spinning--but without using soap. The wool is washed in the river, then allowed to dry on stones or hung from branches. When dry the wool is carded. This consists of removing tiny clumps of undissolved manure--called fichus--using the fingernails.

SPINNING

Throughout Bolivia the traditional implement used by rural women to spin wool is a wooden spindle known as the rueca. In the Valleys Region the more common name is the phuska. The spindle itself consists of a slender axis about 25-30 centimeters long called the tisi which is inserted

through a wooden wheel called phiruru. The tisi is tapered from a point about 4 milimeters in diameter to a maximum thickness (just below the phiruru) of about 10 milimeters. The phiruru itself is about 6 centimeters in diameter and about 1 centimeter thick. The implement is often homemade, although most women prefer phirurus that have been fashioned on a lathe.



The Spinning Spindle

The first step in spinning is to take a handful of raw wool and then pull it with the fingertips to form a soft, fluffy disc called a rosca. A pinch of the softened wool is pulled gently away from the rosca, twisted into a thread with the fingertips, and attached to the base of the spindle just above the phiruru. The spindle is now made to spin with one hand while the other hand continues to pinch and pull the softened wool into a thread. By the time the wool reaches the tisi it is already a twisted thread ready for wrapping about the spindle.

There are two rather amazing aspects to this spinning technique. In the first place, women learn to do it so well that it becomes a practically unconscious activity--something they can do while walking, herding livestock, or sitting talking to a neighbor. More importantly, the thread itself that is collected on the spindle is not always of a uniform thickness. Thin, fine threads used for flannels and ponchos requires a prescribed thickness; heavier threads for blankets and sacks requires a much thicker thread. The fingertips that twist the raw wool from the rosca must be able to distinguish between various thickness norms and maintain that which is desired.

Since spinning is an activity which is fitted around other chores, it is difficult to specify how long the process takes for a given quantity of thread produced. Obviously, the thicker the thread the faster the phuska is completed. The weight of a phuska of spun thread varies from about 1/2 to one ounce. Working steadily a woman can spin 5-6 phuskas per day. On a day of many interruptions not even a phuska will be spun. However, the general norm seems to be about one pound of wool thread per month. In 1980 spun thread (or yarn) was selling in the local markets of the Cochabamba Valley for 300-500 pesos (US$12-20) per pound.

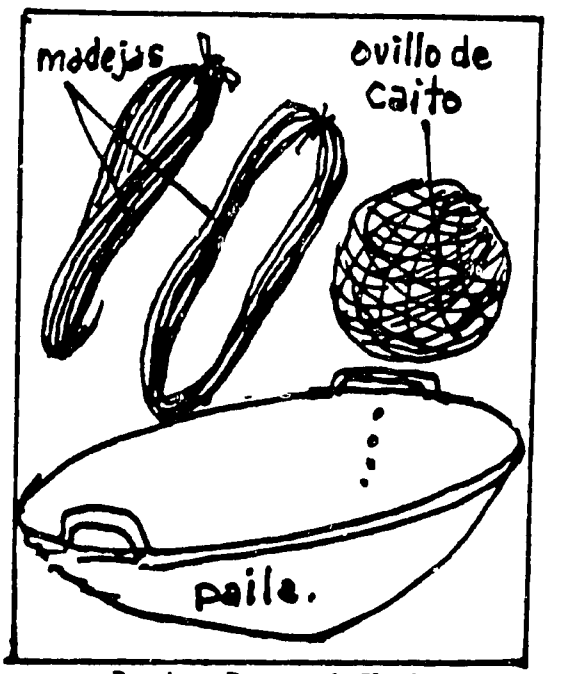
COMBINING THREADS

For the heavier fabrics such as blankets and cargo sacks, wool thread is combined into a two-strand yarn known as caito. The task of combining the threads is called kantido, and it requires even more dexterity than spinning itself. To join and collect the two threads another spindle is used. Known as the k'anti, it is larger and heavier than the phuska but basically follows an identical design employing a tisi and a phiruru. The k'anti, however, is used with two hands. Sitting on the ground, the woman extends her legs barefooted in front of her. She places a spindle of thread between the toes of each foot. From each spindle she takes a thread, unites them, and attaches the yarn to the k'anti. Now, using both hands, she spins the larger spindle vigorously and gradually collects the yarn until the contents of the smaller phuskas are emptied. The resulting caito is then removed from the k'anti and wrapped in loose coils to form a skein or madeja.

DYEING

Loosely coiled, the yarn can now be washed and dyed more easily. The skeins are washed with a laundry detergent, then rinsed with abundant fresh water--a task most conveniently performed at the nearest river. Still wrapped in skeins, the wool is left to dry in the sun.

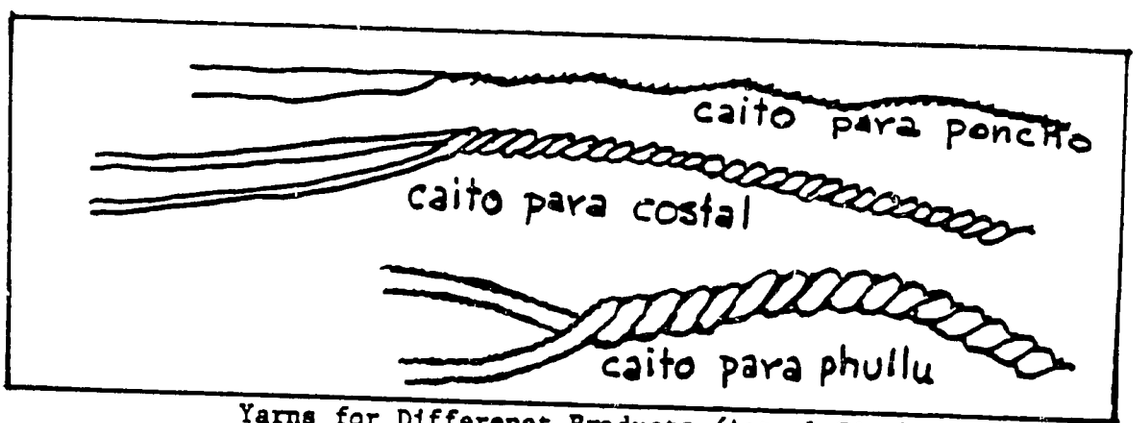
The dyeing is done in a large copper vessel called a paila (also used for making chicha). The paila is filled with a mixture of water, seke (second or third quality chicha), lemon juice to give greater strength and brilliance to the colors, millu (rocksalt used in burnt offerings) to cut down acidity, and one or a combination of commercial indigo dye in powdered form. This mixture is brought to a boil. Then the skeins of wool are added and cooked for 20-30 minutes, stirring constantly. It is not necessary to prepare a new dye liquid for each color; rather, the lighter colors are used first, then the heavier colors are prepared in a progression from lightest to darkest.



Dyeing Pot and Skeins

YARN FOR DIFFERENT PRODUCTS

As mentioned previously, wool yarn begins as a single strand and is then combined--in the task of kantido--to form a double strand. The single strand is known as hilo simple, the latter as hilo doble. However, the strands themselves are not of a uniform thickness. They vary in accordance with the final product for which they are destined. For example, as shown below, yarn (caito) for ponchos is very fine and tightly spun, with a diameter of less than a milimeter. Yarn for cargo sacks (costales) is at least twice as thick, ranging from 1-2 milimeters in diameter. Yarn for a blanket (phullu) is about 3-4 milimeters thick. The relationship between these three different yarns is illustrated below.



Yarns for Differenet Products (Actual Size)

QUANTITIES AND COSTS

The weaving of a poncho requires three pounds of thin yarn. To spin this amount of yarn would cost at least 900 pesos (US$36) in 1981; to dye it would cost 50 pesos (US$2) in labor and materials. A poncho requires about two weeks to weave, with an approximate labor cost of 500 pesos ($20). If sold in a local market, the completed garment would cost about 1,500 pesos (US$60).

A cargo sack requires four and a half pounds of medium yarn. This amount could be spun and dyed for about 300 pesos (US$12) in 1981. The sack requires two days to weave, with a labor cost of 60 pesos (US$2.40). If sold in a local market, a cargo sack would cost about 400 pesos (US$16).

A blanket requires nine pounds of thick yarn, which could be spun and dyed for about 360 pesos (US$14.40). It takes only three days to weave, with an estimated labor cost of 100 pesos (US$4). The blanket would sell for about 500 pesos (US$20) in a local market.

After soaking and boiling for nearly half an hour, the yarn is removed, drained, and hung on a branch to dry. Once dry, the yarn is washed still another time, and once again it is necessary to remove any remaining clumps or other imperfections. After its second carding the wool can now be wrapped in balls. These are known as ovillos de caito, and the task itself is called ovillar. The standard size of the ball of yarn is 1.5 pounds by weight; this is known as a cuatro.

Of course, each weaver and community has their own preferred colors. For example, Emilia Claros of Puca Puca prepares the following colors and mixes:

- lila (purple)--The pure color is used with no mixture of other dyes
- k'ellu (yellow)--The pure color is used
- k'omer (green)--First an intense yellow is prepared, then the green dye is added little by little until the desired tint is obtained. This is the hardest color to dye with because it is so difficult to achieve uniformity.
- rosado (pink)--This is obtained with a "first" water, before any other colors are added.
- aroma (orange)--To the water left from the pink coloring is added an orange dye, then it is "baptized" with a touch of red.
- rojo (red)--In the water left from the orange, pure red dye is added with nothing else. This produces a very intense, bright red.
- guindo or sangre de torro (cherry or bull's blood)--To the water of the red color achieved above must be added a bit of cherry color "baptized" with a touch of black.

Normally, a housewife waits until she has a considerable amount of spun yarn before she dyes it--perhaps 12-18 pounds of caito. Depending on the number of different colors to be dyed, 18 pounds of wool would require a full day to dye.

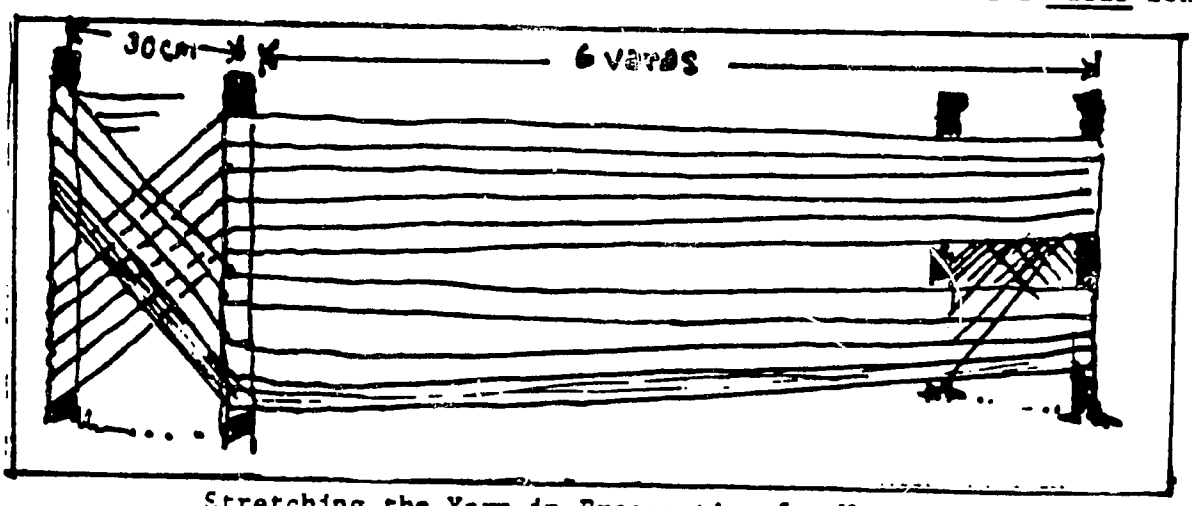
WEAVING A BLANKET

In the Valleys Region it is primarily men who do the weaving, and only then on a seasonal basis during slack periods in the agricultural calendar. The role of women is to spin and dye the yarn. Women also finish already woven products with stitching or decorations. For example, a blanket will be woven in two plazas (halves) which must subsequently be sewn together; or a sack will be stitched with marks made of colored wool to indicate half- and full-loads. However, with the spread of inexpensive factory-made blankets and other textiles, the art of weaving is gradually disappearing among rural households of the region. Those that continue to practice weaving are considered specialists. Just as a community will have its known masons, carpenters, bakers, brickmakers, musicians, and traditional healers, so too will there be several weavers.

The weaving craft is extremely complicated and can not be covered in detail in only a few pages. What is presented below is a very brief summary of the procedures for weaving a blanket on a rustic handloom.

MEASURING AND CROSSING THE YARN (TELAY)

Before the yarn is even placed on the loom it must be stretched and crossed between stakes set in the ground. Known as telay, this task allows the weaver to make sure he has enough yarn to work with--especially enough yarn of each color for every stripe--to complete the blanket. Four stakes are set to form a rectangle about 30 centimeters wide and six or twelve varas long.

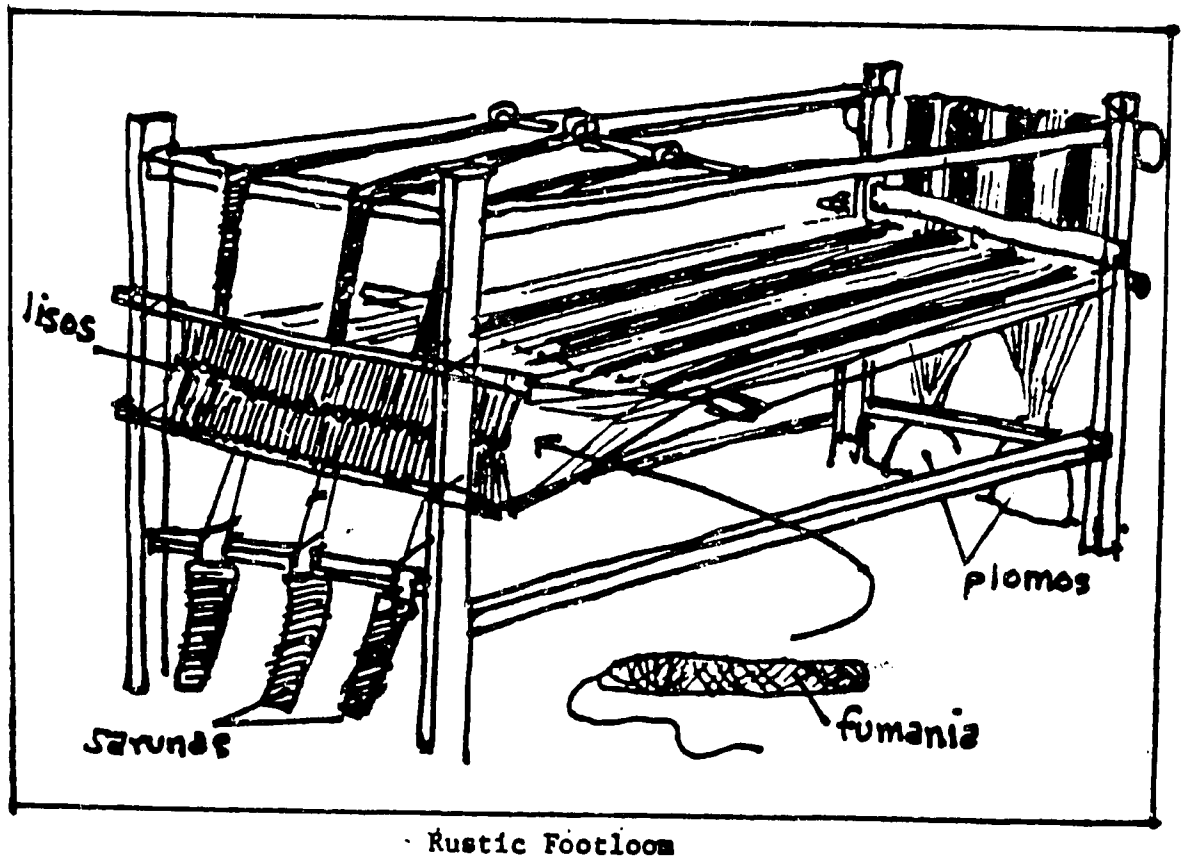


Stretching the Yarn in Preparation for Weaving

A vara is equal to 84 centimeters. Six varas (just over five meters) would produce two plazas (halves) which, when sewed together, would yield a blanket about 2.5 meters in length. Twelve varas of weaving would yield two such blankets. The yarn is stretched on the stakes one color or stripe at a time. At the ends of the rectangle the yarn passes through each other at a sharp angle, stretched from the bottom of one stake to the top of the other, and vice versa.

ATTACHING THE LISOS

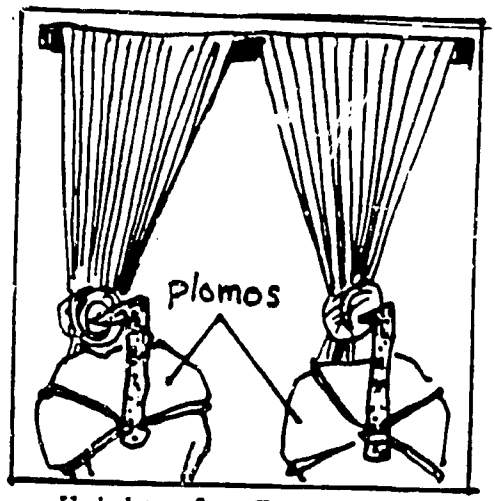
To keep the yarn separate and equidistant a devise is used consisting of two sticks connected by many dozens of threads. In the middle of each thread there is a loop--called a liso--through which the yarn must be passed. This separator implement has a length equal to the width of the loom. It is connected to three straps--one on each end and one in the center--which in turn are attached to three foot levers called sarunas--which are part of the loom itself. When any one of these levers are stepped on by the weaver, the strap corresponding to that lever lifts its respective part of the separator to open a tunnel through the threads for the shuttle to pass back and forth.



Rustic Footloom

OPERATING THE LOOM

Once the yarn of the warp has been passed through the lisos, the stakes are pulled up, the yarn gently rolled up and carried to the loom. The stakes are then tied to the loom frame at each end, about waist-high. The strands of yarn at the far end of the loom (the end opposite the lisos) are divided into two groups --as if they were pigtails--and attached to a pair of weights known as plomos (leads). These weights are used to keep the yarn taut throughout the weaving process.



Weights for Keeping the Threads Taut

The weaving itself involves very coordinated movements of the feet and hands. The pedal on the left serves to separate the lengthwise threads (warp) of the left. The central pedal controls the lifting of the center threads, and the pedal on the right lifts the right-hand threads. The lifting opens a brief space for the horizontal thread (weft) to pass through. The weft thread is rolled about a little wooden shuttle known as the mini or fumiana. For each color a separate shuttle is used. The weave is tamped tight with a flat stick called the k'aji-lana.

POTTERY-MAKING IN HUAYCULI

Because of its aridity and limited agricultural potential, Huayculí is a community where few families can subsist from farming alone. A century ago the residents of Huayculí were renowned as merchants and traders. Today their principal economic activity is pottery-making. Much of their production is sold not for cash but bartered to obtain the food surpluses they cannot grow for themselves. It is a profession that involves all members of the family--men, women, and children. Their techniques have been perfected through many generations, completely without the benefit of formal schooling or scientific studies. Children learn by watching and imitating their parents; the adults continue to improve their skills through continuous practice.

In the following somewhat lengthy narrative we attempt to summarize the most important aspects of pottery-making in Huayculí. These include the gathering of raw materials, preparation of the clay, making clay objects by potters wheel and by hand, decorating with paints and enamel, baking the pottery, and marketing the finished products.

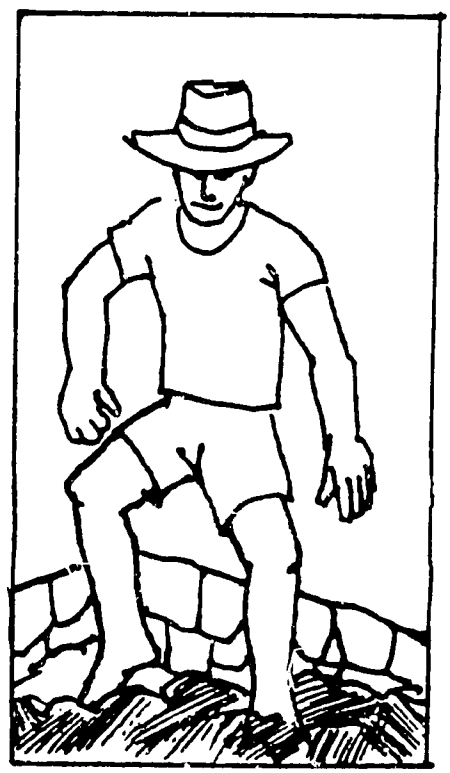
GATHERING THE RAW MATERIALS

The potters of Huayculí make their ceramics from four types of earth ingredients. The first is greda (chalk), also known in quechua as llink'i. It is located in moist spots near riverbeds or springs; it is considered the vital ingredient because it lends strength and plasticity to the clay. The other three materials are different kinds of arcilla (clay) known respectively as yuraj maikha (white earth), yana maikha (black earth), and k'ellu maikha (yellow earth). Each type of soil is located in different places about the community, some as far as five kilometers away, and to gather enough material for an hornada (ovenful) of pottery can take several days. The job usually requires two adults and a burro. Using a hoe, the materials are dug from the ground and loaded into 150-pound sacks. The sacks of chalk are even heavier, because these are loaded and transported damp. A typical load of pottery will require one sack of white clay, another of black clay, two sacks of yellow clay, and two sacks of chalk. The yellow clay is found on the property of an affluent widow. She charges nothing for the materials, but each year those residents having dug holes in her land are expected to fill them up and leave the soil surface smooth for plowing.

PREPARING THE CLAY

Back at the farmhouse the different clays and chalk are unloaded into separate piles. The damp chalk is left to harden several days in the sun. In the meantime it is necessary to prepare the other materials. Each pile of clay must be beaten with a heavy pole or rock, sifted through a fine mesh screen, and beaten and sifted again. This procedure continues until a fine powder is obtained which is completely free of impurities such as small rocks, twigs, straw, or other impurities. Once the chalk is dry, it is broken into chunks. The chunks are then ground by hand in a batán (stone handmill) and finally sifted. The beating and sifting tasks are considered women's work. Such activities are conducted off and on--with interruptions for cooking and other household tasks--but still very meticulously. For every hour spent beating or grinding there is another hour of sifting.

Once adequately prepared, the powdered materials must be mixed with water in a rectangular hole in the ground known as the cajón (box). The cajón is usually about 120 centimeters long by 80 cm wide by 30-40 cm deep. Many cajóns are lined with rocks to facilitate maintenence and purity of the mixture.



Mixing Clay in the Cajón

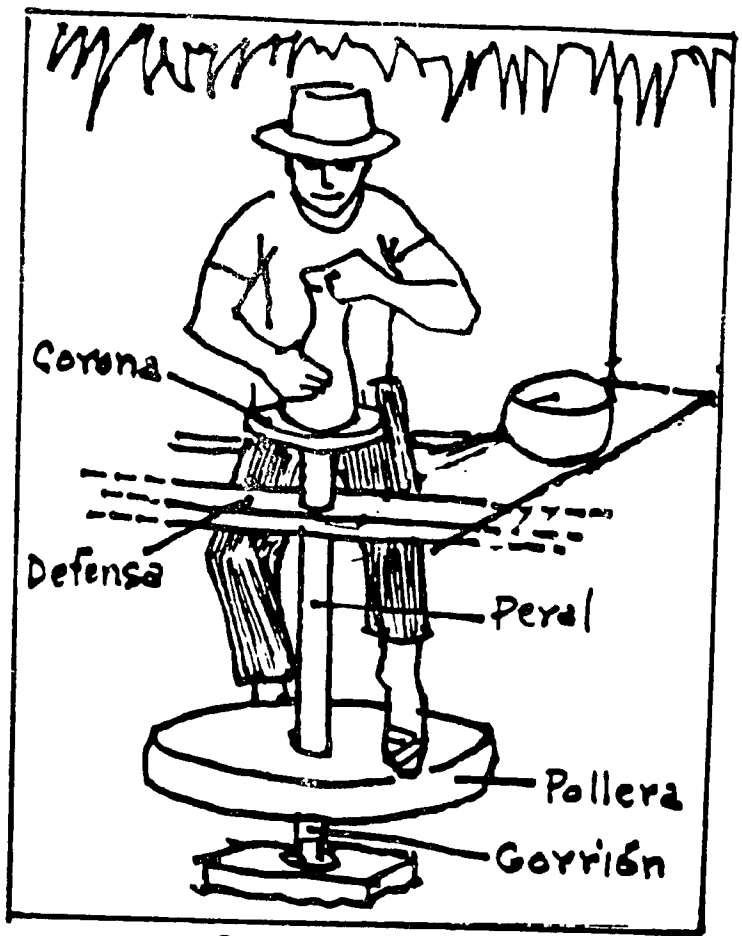
The chalk is sifted into the cajón first, mixed with water, and left to soak for about two hours. Then the different clays are added, little by little, adding only enough additional water to assure a semi-damp mass. This material is now worked into an evenly distributed mixture by stamping with the feet. Some families use a hoe for the mixing, but there exists general agreement that stamping with the feet provides the best results. The stamping or mixing of the clay is a task reserved to men and boys. It should take about four hours, making absolutely sure all lumps are eliminated. Once mixed, the clay should be left to "ferment". Each ceramicist has their own

preferred formula: some for three days, others for a week, still others for two weeks. The fermentation time is not entirely optional, however, because production and marketing deadlines must also be considered. If the artisan is behind schedule he will be forced to use "younger" clay. During the time the clay is in the cajón it must be covered tightly with a plastic sheet to keep the material from drying out. If the clay does dry more than expected, it can be rescued by sprinkling it with water.

USING THE POTTERS WHEEL

The principal tool of the Huayculí potter is the torno or potters wheel. It is used exclusively by men and male children; some families have two of them. Despite many attempts to improve this implement, its design is much the same as that used by potters centuries ago. There are basically three major parts consisting of two wheels connected by a vertical axle. The upper wheel, known as the corona (crown) is the base upon which the clay is shaped. It varies considerably in diameter in accordance with the size of the objects to be fashioned on it. Most coronas are about 20-30 centimeters in diameter and 2-4 cm. thick. The second wheel is known as the pollera (skirt). It is considerably larger and thicker than the corona, perhaps about 40-60 cm in diameter, and is located about 15-20 cm from the ground. Both wheels are solidly attached to an axle known as the peral, which is built from very tough hardwoods brought from tropical lowland regions. After passing through the pollera, the peral is sharpened at one end like a top. It is sometimes covered with a piece of metal. This point, called the gorrión, spins in a greased hole cut out of a piece of wood buried in the ground.

The potters wheel is usually placed in the outside patio at one corner of the farmhouse, preferably located so that it can be reached by direct sunlight. The wheel is enclosed on two sides by walls made of adobe brick, each about a meter high. Crossing between these two walls on the diagonal is a piece of wood known as the defensa and serves as the brace which steadies the entire wheel. A roof is constructed over this make-shift hut to provide the potter shade during the hottest moments of the day. The artisan sits on an adobe seat with his back to the farmhouse. He almost appears to be standing. With his left leg he kicks the pollera to drive the wheel; this leaves his two hands free to shape the clay. All potters huts require a board or table within easy reach of the artisan. Here are located a bowl of water and an assortment of minor implements used frequently by the potter. The tops of the walls to either side of the wheel (usually covered with a board) are used to place the finished ceramics.



Potters Wheel

Before using the potters wheel it is first necessary to prepare the piñas ("pineapples"). These are assorted cones of clay of different sizes according to what ceramics are to be produced that day. Making the piñas is women's work. Chunks of damp clay are removed from the cajón, scrubbed vigorously on the stone handmill, patted into the approximate shape and weight dictated by experience, and placed along the ledge of the potters hut where they can be easily reached.

The potter takes a piece of piña and smacks it sharply onto the corona. The trick is to get the clay exactly in the middle of the wheel. The left foot kicks the pollera and gets the wheel spinning. The clay is first bathed with sprinkled water to smooth the surface of the object as it is molded with the fingers of both hands. The wheel will spin almost continuously throughout the shaping process. To provide certain details to the clay a piece of broken pottery may be used as a lathe. Additional effects are created with wire, a stick, or a piece of goat hide. Water is added to the spinning object repeatedly. The time required

to make each article is quite variable depending on the experience of the potter and the shape and size of the piece. A cooking pot may require 4-5 minutes, a large plate 90 seconds, a piggy bank one minute. As each object is finished, it is separated from the wheel by pulling a wire or thread through the base. The object is then carefully placed on a board near the potter. As each board is filled with pieces, these are carried away and unloaded to dry in the sun on the floor of the patio. Some potters may only produce 40-600 pieces one day and over 200 pieces of a different type the next. Normally, an "ovenload" of ceramics will take at least 1,000 pieces of different types, shapes, and sizes. Working at a good pace--but not really forced--a Huayculí potter will require about a month to produce enough pieces to fill a complete oven. However, if the family faces a production deadline, an ovenload can be produced in as little as two weeks.

CERAMIC HANDIWORK

Few objects produced on the potters wheel can be considered complete because the require minor corrections, polishing, and complimentary adornments. Handles must be made for pots, jugs, lids, and trays; feet and snouts must be made for piggy banks, etc. Making and attaching such adornments is women's work. The additions are sometimes made with a mold, but mostly they are handmade. The clay is dipped in water, molded with the fingers, and then attached to the designated object. Women also prepare a wide variety of ceramic figures from scratch. These include toys--large and small--as well as statues, candelabras, trick drinking vessels, and others. Some objects are so complicated they must be constructed in three separate stages, allowing each previous stage's work to partially dry. Working strictly on a part-time basis, with frequent interruptions to attend their children or prepare meals, women in Huayculí can usually make about 25 pieces of original pottery per day.

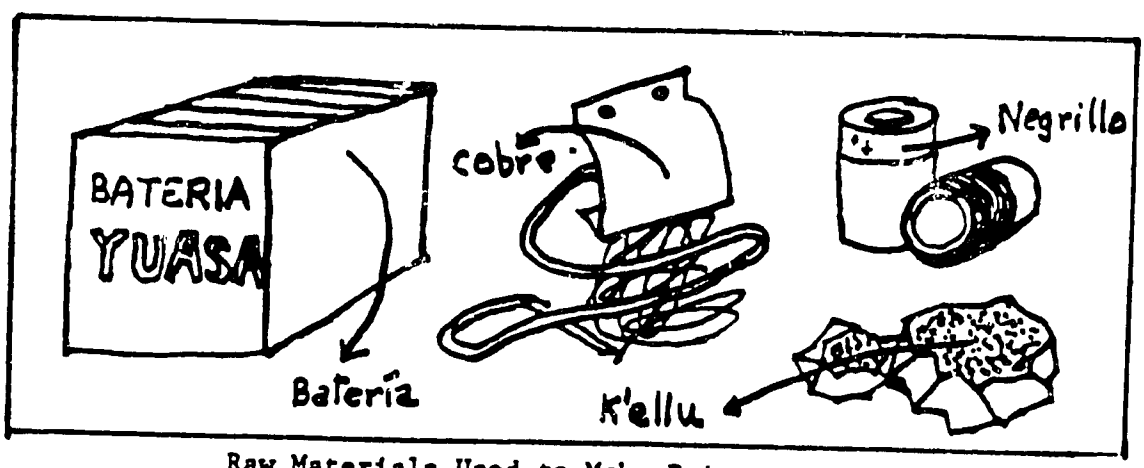
Another job for women is to afinar pottery. This consists of polishing pottery with a badana (goat hide), removing excess clay, attaching signatures and trademarks, etc. These refinements are completed after pottery has been allowed to dry for a day after leaving the wheel. Once again, this is part-time work fitted around essential household chores. If any time remains to the woman after completing these final touches, she will probably begin to work on the preparation of paints and enamels with which to decorate the dry pottery before it is baked.

DECORATING WITH PAINTS AND ENAMEL

RAW MATERIALS: The most abundantly used material for decorating pottery in Huayculí is the enamel fixative in which each piece is bathed. This enamel is made from a water solution of powdered lead (lead oxide), which is in turn obtained from used automobile or truck batteries. Indeed, it is reported that spectacular results have been obtained with powders made from airplane batteries. Two decades ago such batteries could be acquired free from garages and repair shops. But as demand for these throw-aways gradually increased they eventually acquired a price. Today there are specialized intermediaries who travel as far as La Paz, Potosí, Oruro, and Santa Cruz just to buy batteries for resale to potters. By 1981 the price had risen above US$0.10 per pound. The material is sold by almud, a unit of weight equal to 18 pounds).

Copper is another material important to potters. The metal is also salvaged for resale by intermediaries--from used cooking utensils, irons, keys, wire, and sheeting. An ounce of powdered copper cost about US$0.12 in 1981. The mineral is used to impart a green tint to the pottery.

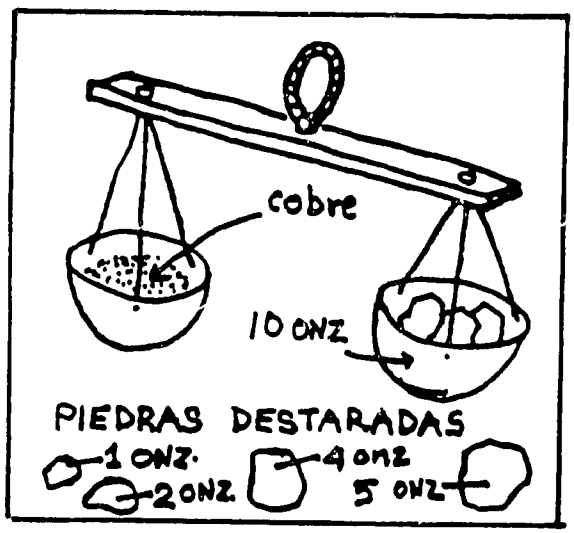
The primary paints used in pottery decoration are black and yellow. The black paint--known as negrillo--is obtained from powdered lead taken from flashlight and radio batteries. The yellow paint, along with light and dark brown colors, is obtained from special rocks found in the Valleys region. Some of the older potters still claim to know how to make as many as six colors from natural materials. But because of the relative convenience of using industrial products, use of traditional colorants (and the knowledge of how to prepare them) has nearly disappeared.



Raw Materials Used to Make Paints and Enamel

PREPARING BATERIA: The enamel fixative made from powdered lead is called batería. To prepare this bath it is first necessary to grind the lead to an even finer powder on a stone handmill known as the marán. A stone roller known as the manija (handle) or morok'o is used with both hands to allow vigorous rubbing. Little by little small quantities of water are sprinkled on the powder to convert it into paste. This paste is next placed in a recepticle filled with water. The larger particles will sink to the bottom, leaving the finer material floating on the surface. The fine paste is removed and added to a second, larger container of water in which the pottery will actually be bathed. The potter continues to grind and separate lead paste, adding it to the bath pot. This process continues until the consistency of the bath solution is thick enough to produce the enameling effect desired.

PREPARING POWDERED COPPER: Scraps of copper wire and other products made with this material are first placed inside a deep covered pot. The pot is then placed in the pottery oven--taking advantage of a load of pottery to be baked--and heated until the melting point. During this "burning" process the color of the copper changes from its original red-orange to a black or lead color. The change means that part of the material has melted. After cooling, these altered pieces are taken to the handmill. Here they are hammered with the stone roller until the blackened material flakes off, leaving the original copper underneath. The flaked copper particles are subsequently ground in the handmill until a powder is obtained. The powder is sifted by pushing it through a piece of flannel using one's fingertips. The larger particles thus screened out are returned to the grindstone for further milling.



Handscale Used in Huayculí

The copper powder must now be weighed to determine the exact amount needed for the load of pottery to be decorated. For this purpose a rustic home-made scale is used. It contains two gourds hung from opposite ends of a balance stick. One gourd is loaded with rocks of predetermined weights (called piedras destaradas) until the desired number of ounces is reached —rarely more than 10 oz. In the other gourd an equal weight of copper powder is placed so that the scale hangs in equilibrium. By means of this device potters buy or borrow needed materials from each other when they do not have time to prepare their own.

Once weighed, the powdered copper is ground into a paste in the same fashion as with baterfa. In turn, the paste is separated in water at least once, with the larger particles ground again. To confirm the optimum state of the copper paste, the ceramicist tests by dipping and inspecting his fingertip.

PREPARING NEGRILLO AND OTHER COLORS: The powdered lead from flashlight batteries is also ground and mixed with water to obtain a black paint for decorating pottery with designs preferred by the ceramicist. The negrillo is stored in a small bowl. Additional colors are ground into paste, dissolved, and placed in their respective bowls. Each color is applied with its own pincel (brush) home-made with horsehair.

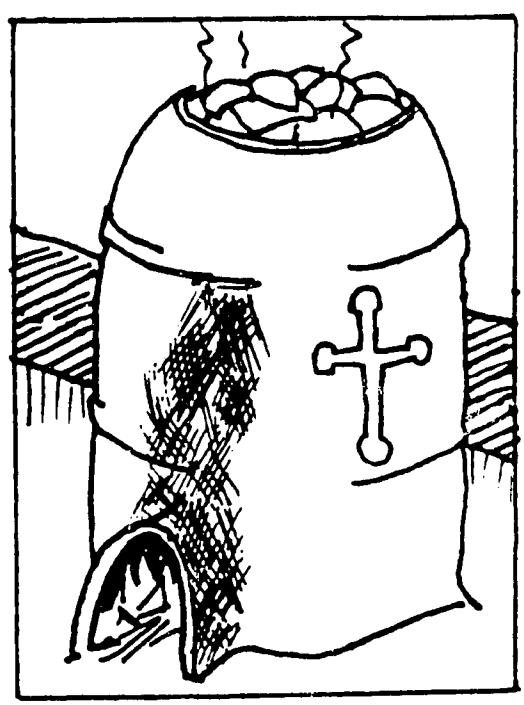
PAINTING AND ENAMELING: The preparation of all materials for painting and enameling pottery is a task assigned to women. The job of actually decorating pottery with paints and enamel is also the woman's responsibility. Usually two women work at a time. They sit on the ground surrounded by the objects to be treated. First the negrillo is applied by one woman, who then passes the piece to her companion for, say, the capricious dabbing of a copper-colored motif. The piece is then left alone until the paints dry, after which it can be bathed in enamel. To apply the enamel, the piece is lifted with one hand and with the other the baterfa solution is applied using a cup. Often when insufficient family labor exists to complete the decorating job quickly, the family will ask neighbors (women) to help them under an arrangement known as compañia. Instead of receiving a cash wage, the person helping will receive one ceramic out of every four painted.

The baterfa serves as a fixing agent, which is why it is applied last. A pure solution of this enamel will result in a greyish color. However, it is also customary to mix copper, negrillo, and other colorings directly into the enamel. Such combinations produce brilliant greens, yellows, browns, and less defined colors. Furthermore, the bathing of the pottery should take place only a few hours before the pieces are placed in the oven to bake. No sooner than the enamel is dry it is time to load the ceramics into the oven.

BAKING THE POTTERY

The first requirement for the quemado or "burning" of pottery is to provision the oven itself with sufficient fuel for at least five hours of baking. Collecting the necessary firewood is no simple task in Huayculí. Some potters bring firewood from as far away as 25 kilometers. A few families actually rent a distant mountainside (privately owned) for the equivalent of US$15-20 per year, just to enjoy clearance rights to meet their fuel needs. A variety of fuels are used to fire potters' ovens in Huayculí: eucalyptus and carob branches, a hardwood known as cruceño (preferred for its strong flame), minor shrubs known locally as sunch'u and viruta, and even sawdust. Depending on the size of the oven, it takes five to eight quep'is of fuel to bake an ovenload of pottery. A quep'is is equivalent to one backload carried by a man. If a potter must purchase his own firewood, the cost in 1981 was about 25 pesos (US$1) per quep'is. Because firewood--like labor--is often a scarce resource, its supply is also subject to compañia arrangements. For example, some families do not have their own pottery oven while others may have as many as two. So the ovenless family will offer to provide the enamel and paints as well as the firewood for a given ovenload of pottery; in exchange, that family will receive one-third to one-half of the finished (baked) production.

The typical ceramic oven of Huayculí resembles a large barrel made of adobe. The structure stands about three meters high with a diameter of some 90-120 centimeters. The lowest third of the oven is devoted to the fireplace which can be loaded through a tunnel-like door. Above the fire chamber is an adobe floor upon which the pottery rests. Most ovens will have a heavy metal belt about two-thirds of the distance from the base. From this point the walls begin to slope inward in a dome-like fashion, but leaving an opening sufficiently large (70-90 cm in diameter) for loading ceramics into the oven. The walls of the structure--inside and out--are finished with a smooth adobe plaster containing ground sheep manure and straw. Most ovens are decorated with a cross carved in relief across the mid section of the structure.



Pottery Oven of Huayculí

The typical oven is built against an embankment or is surrounded on one side by a platform made of earth known as the pisadera (stepping place). Its purpose is to provide elevation for the person(s) loading the oven from above. The loading process itself requires considerable labor, usually 4-6 persons, and often includes neighbors who have been assisting in pottery decoration. Men, women, and children carry the pottery in baskets from the patio floor (once the enamel has dried) to the oven. The larger pieces are loaded first, followed by one row on top of another as progressively smaller ceramics are stacked inside. The task is called apilonando. It requires considerable skill. The lowest rows are the hardest to place because this level usually exceeds the reach of the loader, and pottery must therefore be lowered with a pair or cords known as trensas (pigtails). The task must proceed carefully (to minimize breakage) yet very rapidly too because up to 2,000 pieces must be stacked in a single load. Once fully loaded, the top of the oven is covered with pottery fragments. This layer serves to attract and catch the carbon deposits during baking, leaving the rest of the contents much cleaner; also, the color acquired by the fragments after several hours of heating serves to indicate when the pottery is completely baked.

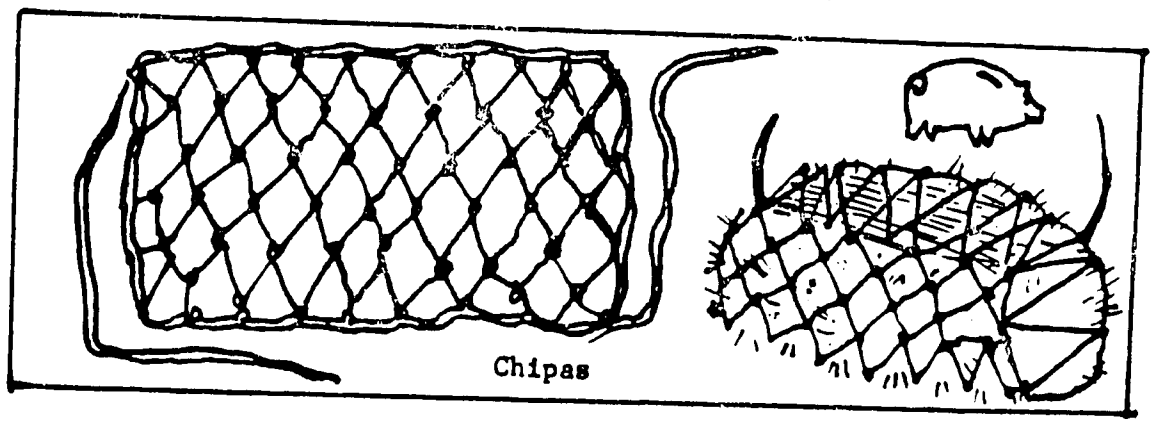
Once the oven is loaded, and before the fire is lit, the potters family and collaborators must conduct a ritual toast to the Pachamama. Hats are removed, participants kneel, and prayers for a successful burning are spoken. Before drinking their alcoholic libations, participants always spill the first drops on the ground in homage to the diety. It sometimes happens that the ritual toast quickly leads to a celebration and the burning of the pottery may be forgotten for hours. Many an ovenload was not fired until late evening or early morning, after the potter has awakened from a drunken slumber.

A typical burn for an average ovenload of pottery would be about three and a half hours. In larger ovens the process can last five hours. During this time the fire must be kept burning continuously, because if the fire goes out the resulting smoke will blacken the pottery and greatly reduce its value. This is why the potter must provision himself with a generous supply of fuelwood before the fire is lit. When the pottery has been adequately baked there is a significant reduction in the amount of smoke leaving the oven, and furthermore the pottery fragments on top begin to acquire a greyish color.

Normally the contents of the oven must be left to cool for 6-10 hours before they can be removed. If the load has been produced under contract to a buyer, the ceramics will be left inside the oven until the buyer can personally oversee the unloading. The pottery is unloaded into baskets and stored on the ground under a roofed shelter to await packing and marketing.

PACKING CERAMICS FOR TRANSPORT

In Huayculí pottery is transported in straw packed inside cargo nets known as chipas. A chipa is made from twisted leather strips knotted together to form a loose weave similar to that of a hammock. There are large chipas and small, each specialized to the transport of larger or smaller pieces. To transport a single ovenload of about 2,000 pieces a potter would need about 15-20 chipas. He would also need about 8-10 burro loads of straw. The straw is purchased from highlanders, who harvest the paja brava of the Altiplano. In 1980 this straw was selling for 30 pesos (US$1.20) per burro load. A large chipa will require an entire load of straw, a smaller chipa a half load.



Chipas

The chipa is first completely extended on the ground to form a rectangle of, say, two meters long by one meter wide. Extending from each end of the cargo net is a two-meter length of leather rope. A bed of straw is placed over the stretched chipa. On top of this straw would be placed the first row of ceramics--for example, piggy banks: five rows of seven pieces each, or 35 in all. These would be covered by a second bed of straw, then a second layer of piggy banks, and so on until six layers or 210 pieces have been packed. After a final layer of straw the sides of the chipa are sewn up with the loose lengths of rope following a triangular pattern. The trick of safe transport in chipas first depends on using plenty of straw, and secondly on binding the chipa very tightly with the leather rope. Furthermore, during transport by truck it is necessary for the family member accompanying the load to make sure other passengers do not sit on top of the stuffed chipas.

POTTERY MARKETING

For generations Huayculí has enjoyed considerable fame as a community of traders and merchants. Before the advent of motor vehicles, large teams of pack animals served the residents of Huayculí carrying their ceramics to distant cities on trips lasting weeks and even months to trade for essential food supplies and manufactured goods. The volume of trade was large enough to support dozens of arrieros (muleteers) and hundreds of horses, mules, and burros. While half the pack animals were traveling, the other half rested in their apeaderos or pasturelands awaiting the next trip. Road improvements and the availability of trucks and buses has greatly diminished the use of pack animals, but Huayculeños retain their penchant for trade and continually launch long-distance marketing ventures requiring several weeks. At the same time, they conduct intensive marketing at local fairs and even do considerable production of ceramics on contract.

LONG-DISTANCE MARKETING

The largest share of ceramics produced in Huayculí are destined for far away markets in the cities of La Paz, Potosí, Oruro, Chuquisaca, and Santa Cruz. Marketing trips to these locations usually coincide with special religious or civic celebrations.

The single fair of greatest importance to potters is probably that of Alasitas in La Paz, which begins January 24 and lasts for 2-3 weeks. In essence, this festival is a celebration of anticipated affluence featuring a fat and happy little god known as the Ekeko who dispenses luck and makes peoples' dreams come true. In this fiesta, everyone buys miniatures of what they would truly like to acquire in real life--a house, car, truck, kitchen stove, abundant food, cattle, etc. It is thus a fabulous market for makers of ceramic toys. But Alasitas is also the largest and most varied market for rural artesan crafts in Bolivia. In addition to toys, potters of Huayculí sell all kinds of plates, cups, pitchers, vases, trays, boxes, ashtrays, piggy banks, trick drinking vessels, and many more. Most of the female heads-of-household in Huayculí attend this festival every year, contracting trucks to carry their production to La Paz and remaining there 2-3 weeks until their pottery has been sold.

Another highland market for ceramics is Oruro around Christmas and New Years. The characteristic festival food of this season is the buñuelo, a round corn fritter served with honey. The demand for pitchers of 1/4, 1/2 and up to one liter capacity for serving honey is quite intense, but

a wide assortment of other ceramic items also get sold. The festival of Caracollo (September) provides artisans of Huayculí with a chance to barter ceramics for chuño (dehydrated potatoes), a product very highly prized in the Valleys region and used in a wide variety of soups and dishes. In considerably smaller scale, some Huayculeños travel to Potosí for the festival of the Holy Trinity (May-June), to Sucre for Easter (April) or Pentecost (May), and to Tarabuco's sunday markets which are attracting increased numbers of tourists.

Several families of Huayculí specialize the sale of their production to the markets of the eastern tropical lowlands, particularly the city of Santa Cruz, Camiri, Montero, Valle Grande, and the colonization zones. To prepare for a sales trip these families will make pottery for several months so they can hire a full truck. If one family's production is not enough, it is not uncommon for them to buy the production of their neighbors to complete the load. In other cases they may sell the production of other families on consignment in exchange for a similar favor for themselves the following year.

SELLING TO LOCAL MARKETS

The most permanent and sure market of Huayculí artisans are local weekly fairs. These markets do not necessarily offer the most favorable prices, but they adsorb relatively small but continuous supplies of ceramics on a routine basis. This allows the artisan to earn cash income to finance market purchases of basic necessities several times a month. In some cases this is also achieved through direct barter.

In order of importance, the local markets frequented by Huayculeños are Punata, Cliza, Tarata, and Cochabamba. The Tuesday Market at Punata allows for direct barter transactions of pottery with produce. There the unit of exchange is quite favorable: 1.5 times in produce the volume of the ceramic traded. If a woman of Huayculí fails to sell all her ceramics on market day, she will leave the balance in the house of an acquaintance until the following week.

The Cliza Sunday Market is nearly as important as Punata, both for cash and barter sales, although the volume sold or traded is generally less. Tarata's Thursday Market is only important once every four weeks--on the last thursday of the month--when a significantly larger number of people attend.

The Cochabamba market--held wednesdays and saturdays--offers ceramicists from Huayculí two additional opportunities to dispose of their wares, either selling to rankeras (intermediaries) or to consumers directly on a retail basis.

ARANI: THE BARTER FAIR OF THE YEAR

After Alasitas in La Paz, the second most important annual market fair for the potters of Huayculí is the Arani Fair, held August 24th. Its great significance is explained by the fact that it is essentially a barter fair. As such, it is the last opportunity of the calendar year for Huayculeños to procure large quantities of agricultural produce for storage as a food surplus. The potters prepare their crafts over several months to be ready for this fair. On the day before the event the roads in and out of Huayculí are lined with chipas full of ceramics awaiting truck transport to the fair.

At Arani the barter transaction is determined by the volume of the ceramic exchanged: a plateful, a potful, a jugful of produce--potatoes ocas, papalisas, maize, peas, habas--for the plate, pot, or jug desired. Once the produce is transported back to Huayculí, a ceremony of toasting the traded commodities is celebrated. In anticipation of this event the makers of chicha work overtime to stockpile enough beverage to meet the huge demand. The party will continue for several days.

SALE BY OVENLOADS AND DIRECT CONTRACT

Some potters of Huayculí produce their ceramics to the precise needs and specifications of buyers. In these instances the pottery is sold one ovenful at a time. The contract price is determined by the size of the oven and the size and number of objects it will hold. For example, Julio Caballero sold an hornada (ovenload) of vases, containing 400 pieces, for 1,600 pesos (US$64) in 1981, or four pesos per vase. Lucio Alba estimates that his father earns 3,000 to 4,000 pesos for every hornada sold. The ovenload purchasing system is most common with intermediaries. To the artisan producer well acquainted with the marketing costs of his products--including the complicated logistics of obtaining packing straw, renting transport, time lost in marketing activities, and travel expenses--the sale by ovenload offers many potential advantages. But on the negative side there are disadvantages that transcend lost profit opportunities. One of these involves contract adjustments after the ceramics are baked. The potter is not allowed to unload his contracted pottery until the buyer is present to inspect the contents for breakage and quality. Any unusual level of discoloration or breakage is bound to result in a large price reduction.

EXAMPLES OF POTTERY PRODUCTION, COSTS, SALES, AND NET INCOME

CESAR NOGALES

From September 13 to 23, 1980, Cesar Nogales and his family produced 4,550 small pieces of pottery. These included 1,300 candlesticks, 700 ashtrays, 1,500 small plates, 700 piggy banks, and 300 clay toys. During the production stage--including the preparation of clay and enamels --a total of 21 days of labor were required, of which seven were provided by women. The pottery was loaded into the oven and baked on September 25, a task requiring two men and four women. The following day the pottery was unloaded and packed in 15 chipas for transport to Santa Cruz, again requiring six person-days of labor. Over the next four days Cesar and his sister traveled to Santa Cruz, sold their pottery, and returned to Huayculí.

The ceramics were sold wholesale in Santa Cruz for a total of 11,000 pesos (US$440). Production costs are estimated at 2,521 pesos (as recorded in Cesar's notebook) and include HIRED LABOR--1,015, MATERIALS --157, CHICHA AND COCA--99, and TRAVEL EXPENSES--1,250. The estimated net income is therefore 8,479 pesos (US$339). About 23 days of family labor were required to produce this outcome, which results in a net earnings of about 369 pesos (US$15) per day contributed.

JULIO CABALLERO

From September 29 to October 19, Julio Caballero and his family produced 1,540 pieces of pottery. Their production consisted of 950 clay bottles, 540 toys, and 50 plates. The ovenload was fired on October 21 and unloaded and packed into ten chipas on October 25. The following day this cargo of pottery was sold in Cochabamba for a total of 1,250 pesos (US$ 50). Total production costs came to 668 pesos (US$27) and included HIRED LABOR--370, FUEL--120, COPPER--18, CHICHA--60, and TRANSPORT--100. The estimated net income is about 582 pesos (US$23). A total of 19 labor days were required, of which 12 days were provided by family laborers. This suggests a return of 49 pesos (US$1.95) per day contributed, or just about even with the prevailing wage rate of 50 pesos per day for a hired laborer.

DEMETRIO ALVAREZ

From May 30 to June 30, 1980, Demetrio Alvarez and his family produced a total of 2,390 pieces of pottery--all clay bottles. These were fired July 2, and three days later the entire ovenload was sold to a single buyer for 3,000 pesos (US$120). The production of this ovenload required 32.5 days of family labor, of which 8.5 days were contributed by women. Cash oulays were quite minor and totalled only 366 pesos (US$15). These included HIRED LABOR--120, FUELWOOD--200, COPPER--36, and CHICHA--10 pesos. The estimated net income earned by Demetrio Alvarez's household for the contract is 2,634 pesos (US$105). The net return per day of family labor contributed is 81 pesos (US$3.24).

HOUSE CONSTRUCTION

Although house construction is not an artisan craft in a narrow sense of the term, it requires skills commonly associated with craftsmen. Like weaving the clothes one wears, or growing one's own food, providing shelter is a subsistence prerequisite that deserves to be mentioned in any book concerned with traditional knowledge. Sooner or later every rural family will construct, expand, or repair its own dwelling. In Bolivian farming communities, the building of a home is one of the highest priorities of newlyweds and symbolizes their independence as comuneros or community residents. Construction of the dwelling itself is a very dynamic process: it begins with the private choice and preparations of a single family, then gradually attracts the assistance of experienced relatives, and by the time the house is ready to be roofed the project becomes a community-wide enterprise and a major social event. House construction is also dynamic because the structure and layout of the dwelling evolves over time reflecting the growth of the family and its assets, but also adapting itself to the family's productive activities and needs.

In this section we will first describe how adobe blocks, bricks, and roof tiles are made, because this technology shares many similarities with pottery-making techniques. Next, the different stages in constructing a house will be reviewed. Finally, a series of representative layouts for farmhouses in Puca Puca, Huayculí, and Melga will be presented, both to demonstrate their common elements as well as their differences.

MAKING ADOBE BLOCKS, BRICKS, AND ROOF TILES

Most rural homes are built of sun-baked adobe blocks and roofed with tejas (ceramic tiles). The homeowner usually makes his own blocks, and normally house construction will not begin until the requisite number of blocks have been prepared. In contrast, making bricks and roof tiles requires an oven, large amounts of fuelwood, and the production of thousands of pieces to justify the time and expense involved. For these reasons it is unlikely that more than a couple of families per community will operate a kiln for bricks and tiles, and only as an income-generating activity to supplement their farming activities.

PREPARING THE MUD

Adobe blocks, bricks, and roof tiles are all made from a mud mixture containing common earth, animal manure, and water. In the case of the adobe blocks, chopped straw is added. The mixture is prepared in a cajón and stamped with the feet in the same way that Huayculí potters prepare their clay. After the mud has been allowed to "ferment" several days it is packed into molds, "cut", and the many dozens of blocks left to sun-dry until hard enough for use.

Because bricks and tiles are fired in a kiln, the preparation of their mud mixture is more complicated because the ingredients must be carefully screened to eliminate pebbles, sticks, and other materials that would cause the ceramics to break or crack during heating. The manure of preference is that of burros. All members of the family participate in its collection, but the pulverizing and sifting of the manure is a responsibility assigned only to women. About one sack of manure is required for every three sacks of soil. For a single ovenload of 3,000 pieces (bricks and/or tiles) it is necessary to prepare ten cargas (2,250 pounds) of manure.

To pulverize and screen a single carga of manure takes about three hours. The manure is first piled on the ground in a clean, flat location; the pile itself should be not too high nor too wide. Kneeling before this pile, the woman takes a pair of sticks (each about two meters long) and with one in each hand she beats the manure with gentle blows--attempting to crumble the material without sending it flying in all directions. Now and then she stops the beating and turns the contents of the pile with a rake. Once the manure has been pulverized it is screened. This is done using a loosely woven straw basket. In a similar fashion the earth for the mud must also be pulverized and screened. These tasks are done on a part-time basis and must be fitted around routine household chores. Thus, just to prepare the materials for an ovenload of bricks or tiles can take several weeks.

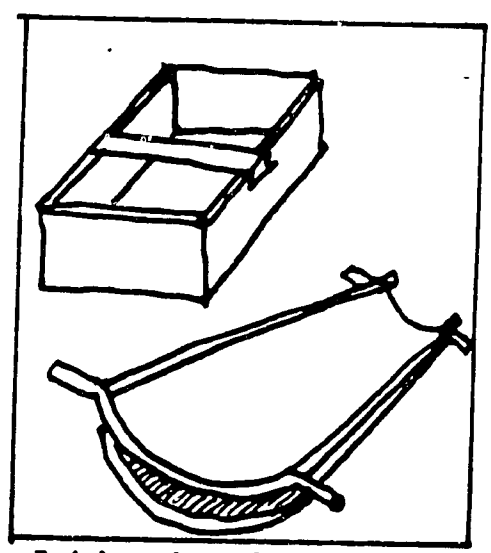
When the ingredients are ready, the earth is placed in the cajón first and mixed with water. This mixture is left for an evening so that it has a chance to soften completely. The next day the manure is added. The combined mixture is now mixed with the feet for about two hours; usually the entire family participates in this task. Once completely mixed the mud is left to mature for 4-5 days. Mud that has not aged becomes llullu (young) and is too runny to hold the form of the mold. During heating such mud crumbles as if it were sugar. Indeed, some brick-makers prefer to age their mud for up to two weeks. During this time the mud must be kept covered with a sheet of plastic or fabric.

GATHERING THE FIREWOOD

Sometimes before the mud-making begins and other times after it has been prepared and left to mature, the brick-maker must begin to gather the firewood needed for the kiln. Fuelwood in Puca Puca is known as chakatia. To gather enough for an ovenload of bricks requires many days. A single burn takes some 18-20 hours, and to keep the fire burning that long takes some 50 cargas (loads) of firewood. Even before it is gathered, the firewood must first be cut down and left to dry; this reduces the weight of the loads, a very important consideration since the wood is carried on the backs of family members, not burros. Working alone, a man can probably transport 6-7 loads per day, suggesting eight days of transport. To this must be added another eight days to cut and prepare the wood for transport. Given such labor requirements, brick-makers either gather their fuel with 1-2 companions, or they buy their wood from others--at a cost of about US$0.60 (15 pesos) in 1980.

MAKING THE BRICKS AND TILES

Bricks and tiles are made with molds. The molds for bricks, known as adoberas, are made of wood; rooftile molds are metalic. First, the ground where the molded mud forms are to be placed must be carefully leveled. This task is not done just with the naked eye but with the help of a carpenter's level. Once leveled, the molding of the bricks and tiles begins. The mold is first sprinkled with sand, then placed on top of a brick, filled with mud, and compacted. Then comes the "cutting" of the form from the mold, a task called kalapaqueado. The sand on the mold allows the mud mixture to be separated more easily.



Brick and Rooftile Molds

Between two workers it is possible to mold and cut about 300 rooftiles or 200 bricks. A typical kiln has a capacity for 2,500 rooftiles and 600 bricks, suggesting 11 days with two laborers (22 person-days total) to complete an ovenload. Once cut from its mold, the tile must be left to dry for a day before it is scraped clean of its blemishes. Because of its greater thickness, the brick requires about four days to dry.

BURNING THE BRICKS AND ROOFTILES

Once dried, the bricks go into the kiln first. A quantity of 600 bricks would be stacked in four dagas (layers) of 150 pieces each. The rooftiles are then placed on top and are stacked vertically. For 2,500 tiles there would be five dagas of 500 pieces each. When the oven is full it must be covered with a thick layer of dry cattle manure--usually about eight cargas (1 carga= 225 pounds) are used--to make sure the heat is trapped inside the kiln and used to maximum advantage.

Before the fire is set the brickmaker and his family conduct a ritual offering to the Pachamama, praying for a bood burn and a successful batch. Then the kiln is fired, usually very early in the morning. The fire must continue all day long and most of the evening--until the second crowing of the rooster (about 2 A.M). The task is so uncomfortable, because of the exposure to heat and the constant sweating, that tending the kiln is a job that must be alternated between one worker and another every two hours. After the fire dies, the bricks and tiles are left inside the kiln for about 7-10 days, and even then they may still be warm and should be removed with a rag.

One of the principal enemies of the brickmaker is rain. Cold rain falling on the kiln, or on still-warm bricks, can destroy weeks of work in only a few minutes. Upon the threat of rain, the brickmaker must cover the top of the kiln with a roof of tiles.

MARKETING

It takes another two days to unload the kiln. Bricks and rooftiles made in Puca Puca are sold in the community or in Aiquile. The transportation cost for an ovenload was some US$24 (600 pesos) in 1980 and required 2-3 trips. Unless produced on contract, an ovenload of bricks and tiles--about 3,000 pieces--would sell for 4,500-4,800 pesos (US$180-192). In 1980 a thousand bricks sold for 1,200 pesos in Aiquile, while rooftiles sold between 1,500-2,000 per thousand. Rooftiles made in Puca Puca have an excellent local reputation because it is said that they last at least ten years, which is almost twice as long as the tiles produced in other neighboring communities.

NET PROFIT

From beginning to end, the production and sale of an ovenload of bricks and tiles requires about two months and involves some 65 person-days of labor. Calculating a wage of 40 pesos (US$1.60) per day, making bricks is almost a break-even proposition, as shown below. For this reason it

tends to be a part-time enterprise, something a family will do to productively occupy surplus family labor during slack periods of the agricultural cycle.

NET INCOME FOR THE PRODUCTION OF AN
OVENLOAD OF BRICKS AND ROOFTILES

		Days	Value
Labor Costs			
Digging and screening dirt		2	
Collecting and pulverizing manure		3	
Soaking, mixing mud (3 batches)		6	
Cutting and transporting fuelwood		16	
Molding and cutting bricks or tiles		22	
2,500 tiles	16 days		
600 bricks	6		
Scraping bricks		2	
Loading kiln		4	
Tending kiln		4	
Unloading kiln		4	
Transport and sale		2	
Total Labor		65	2,600
Materials and Other Costs			
Manure: for mud	10 cargas		200
for covering kiln	8		160
Transportation			600
Chicha, coca for laborers			325
TOTAL COSTS			B$ 3,885
Income			
Bricks: 600 x (B$1,200 per thousand)		720	
Tiles: 2,500 x (B$1,500 per thousand)		3,750	
TOTAL INCOME			B$ 4,470
NET INCOME			B$ 585
			US$ 23

STAGES IN BUILDING A HOUSE

LOCATING THE HOMESITE

Upon the formation of a new family, one of the first priorities is to identify the place where the couple will build their house. Where land holdings permit, the site may be selected from land designated as the inheritance of the son from his father. It is possible to build a house on property belonging to the wife, but this choice is not very frequent and is subject to criticism by the rural community. If the economic situation of the newlyweds permits it, they may actually purchase a piece of property on which to build their home. A final alternative is for the couple to ask for an allotment of land which is located on common property belonging to the community as a whole.

One does not find a pattern of dwellings where sons build their homes in close proximity to that of their parents. Instead, there is a marked tendency toward dispersion, which is symbolically important to indicate the independence of the newlyweds. However, in all other respects the relationship of married children to their parents usually remains very close and highly supportive.

GATHERING THE MATERIALS

The first step is to collect rocks for the foundations of the house. Depending on the community and the house location, gathering rocks can take a few days or several weeks. Local gullies and riverbeds are the primary source for the rocks. For about 25 linear meters of foundation some 15,000 kilos of rock will be required. Estimated cost: US$40.

Next it is necessary to prepare adobe bricks. As described previously, these are made with mud, manure, and straw. The adobe-making task is frequently conducted as an extended family obligation, with parents assisting their children. A structure with 25 linear meters of wall or about 84 square meters in total would require about 2,500 adobes. Estimated cost: US$100.

Either before or after the adobes have been made it is necessary to prepare timbers for roof beams, rafters, joists, door and window frames, etc. The wood must be cut and allowed to dry completely. A single eucalyptus tree may be cut for this purpose and hewn with handtools. Not including the labor for cutting and hewing, the wood itself would bear an estimated value of about US$60. Along with the wood it is necessary to purchase about 3 kilos of nails and some wire (US$10). Roofing materials

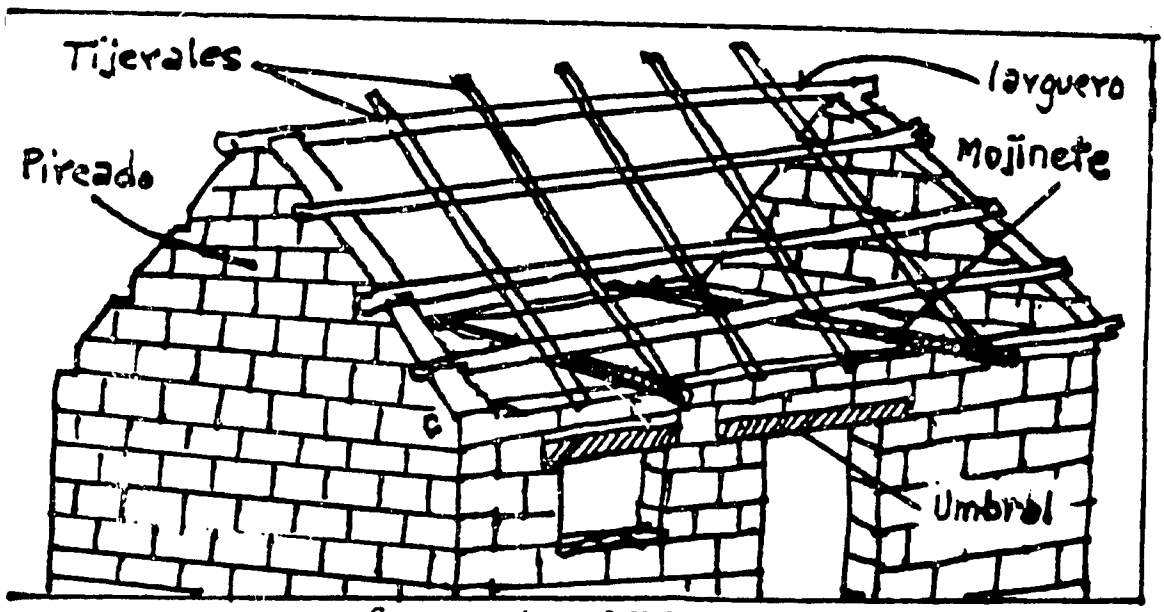
will probably be purchased later, after the walls and roofbeams have been erected (see Roofing the House).

DIGGING THE FOUNDATIONS

Usually the digging and laying of foundations proceed almost simultaneously. The depth of the foundation trench seldom exceeds 30 centimeters and has a width roughly equal to the length of an adobe brick. The trench is dug following guidelines stretched between stakes. Once complete, the trench is filled with rocks bound in place by a mud mortar. Normally the foundation is built to a height of 25-30 centimeters above ground level. Prior to the laying of foundations it is customary to conduct a ritual offering to the Pachamama, invoking Her protection over the occupants of the swelling and asking that the homesite itself be a healthy one for raising a family.

CONSTRUCTION OF THE WALLS

To erect the walls the homeowner usually requests the assistance of a relative or neighbor who has had formal construction experience in masonry or carpentry. For the main walls of the house, the adobes will be placed face downward. For interior divisions or perhaps a secondary structure--like a kitchen--attached to the main house, the adobes will be placed on edge so as to economize on materials. The typical home is constructed de dos aguas (for two waters), with a roof slanting in two directions.



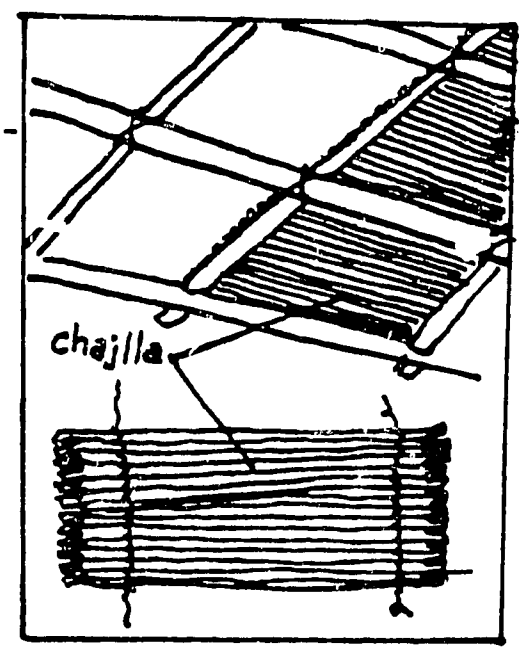
Construction of Walls and Beams

Therefore, the ends of the dwelling will be built to a point (about three meters high) whereas the remaining walls--front and back--will be rectangular. When the walls are about 180 centimeters high the door and window frames (umbrales) are set in place. At about two meters the crossbeams (mojinetes) are secured. The adobe masonry continues to climb on each end to construct the pointed end walls (pircados) which will serve as the base upon which the horizontal roofbeams (largueros) will rest. At last the rafters (tijerales) are attached to the largueros.

ROOFING THE HOUSE

When the walls and roofbeams are in place it is time to collect roofing materials. There will be an inner roof and an outer roof. The first of these is made from sticks known as chajlla or a bamboo material known as caña brava or caña hueca. The sticks are sewn or wired together tightly to form a kind of matting. In turn, the matting is placed horizontally to cover the spaces between the rafters and bound firmly in place with wire. The construction of the inner roof is usually a task conducted by close friends or relatives of the homeowner.

Finally comes the construction of the outer roof or what is condidered the formal "roofing" itself. This can be considered the most important construction stage by far--first because it symbolizes the completion of the project, and second because it is a moment of large-scale community cooperation. All residents are expected to attend this social happening, to contribute labor and materials, and best wishes to the owners of the new home.



The Inner Layer of Roof

If made of straw, the inner roof is first plastered with a layer of mud, which serves to hold the clumps of straw in place. If ceramic rooftiles are used, these are largely held in place by their own weight. Tin sheeting is secured to the rafters with nails.

The roofing party is a major social event. Some neighbors arrive bearing arcs of woven flowers adorned with new peso notes, which will be deposited inside the dwelling as a symbol of prosperity and as an economic cooperation for the homeowner. Then come repeated burnt offerings and abundant libations with chicha. Inevitably one or more animals will be butchered

to serve the collaborating guests a sumptuous meal. The blood of the butchered animals, in certain cases, will be sprinkled on the walls of the new dwelling to scare away evil spirits. After the eating, endless rounds of chicha and other alcoholic beverages will be served in the midst of an improvised dance and general merriment.

HOUSES IN PUCA PUCA

In Puca Puca the large majority of homes are found in scattered locations as near as possible to the fields where their owners work. The idea of a concentrated settlement encounters considerable resistence among local residents because it implies a complete structural transformation of their way of life and work routines. This is partly because the household unit is considered to include not only family members but their livestock as well. Families will defend their privacy and individuality by separating themselves a hundred meters or so from their nearest neighbor. This scattering makes it much more difficult and costly to supply local residents with the elemental services of electricity, water, and sewage. Yet it is ironic that families in Puca Puca, although highly individualistic in a physical sense, demonstrate very strong communal solidarity.

The farmhouse is generally born with the organization of a new family unit through formal or common-law marriage. The house is usually constructed by stages: first, just one or two rooms; then another room as the family grows or more produce storage is needed. There appear to be several common themes in the house plans of Puca Puca. Most homes are organized around a central patio, which may be enclosed on two, three, or all four sides. All homes have a troje or corn bin, and in some cases several of these structures. In nearly all cases the livestock is corraled separately from the farmhouse itself. All homes have at least one storage room or despensa. In general, the kitchen is located at the opposite corner of the farmhouse from the bedroom(s). For the most part Puca Puca dwellings have few windows; and almost invariably the few windows that do exist face toward the central patio. The tendency is for most families to sleep together in the same bedroom. In three of the four houseplans presented below, there is only one bedroom in the farmhouse. Finally, all families live adjacent to a chacra (cultivated field) or a huerta (garden). Perhaps one home out of every two has an outdoor oven. Most homes have at least one shade tree.

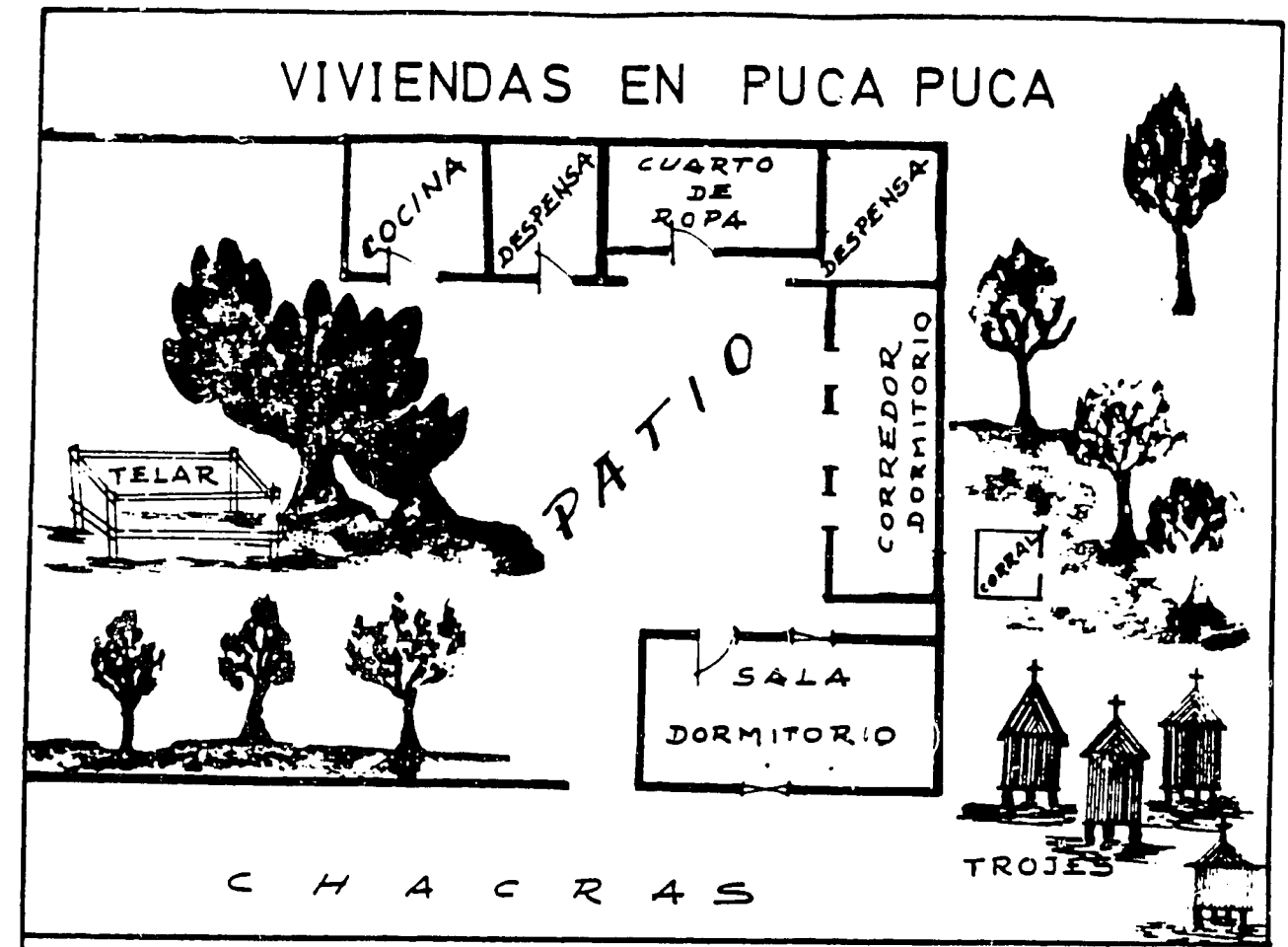
KITCHEN: The nucleus of the farmhouse in Puca Puca seems to be the kitchen. All meals eaten at home are consumed in the kitchen; there is no dining room. Sometimes there is a chair or a box to sit on, but the act of eating does not involve a table. Each person either has their own utensils and eats from a dish balanced on their knees, or everyone squats or sits around a common bowl and eats from it.

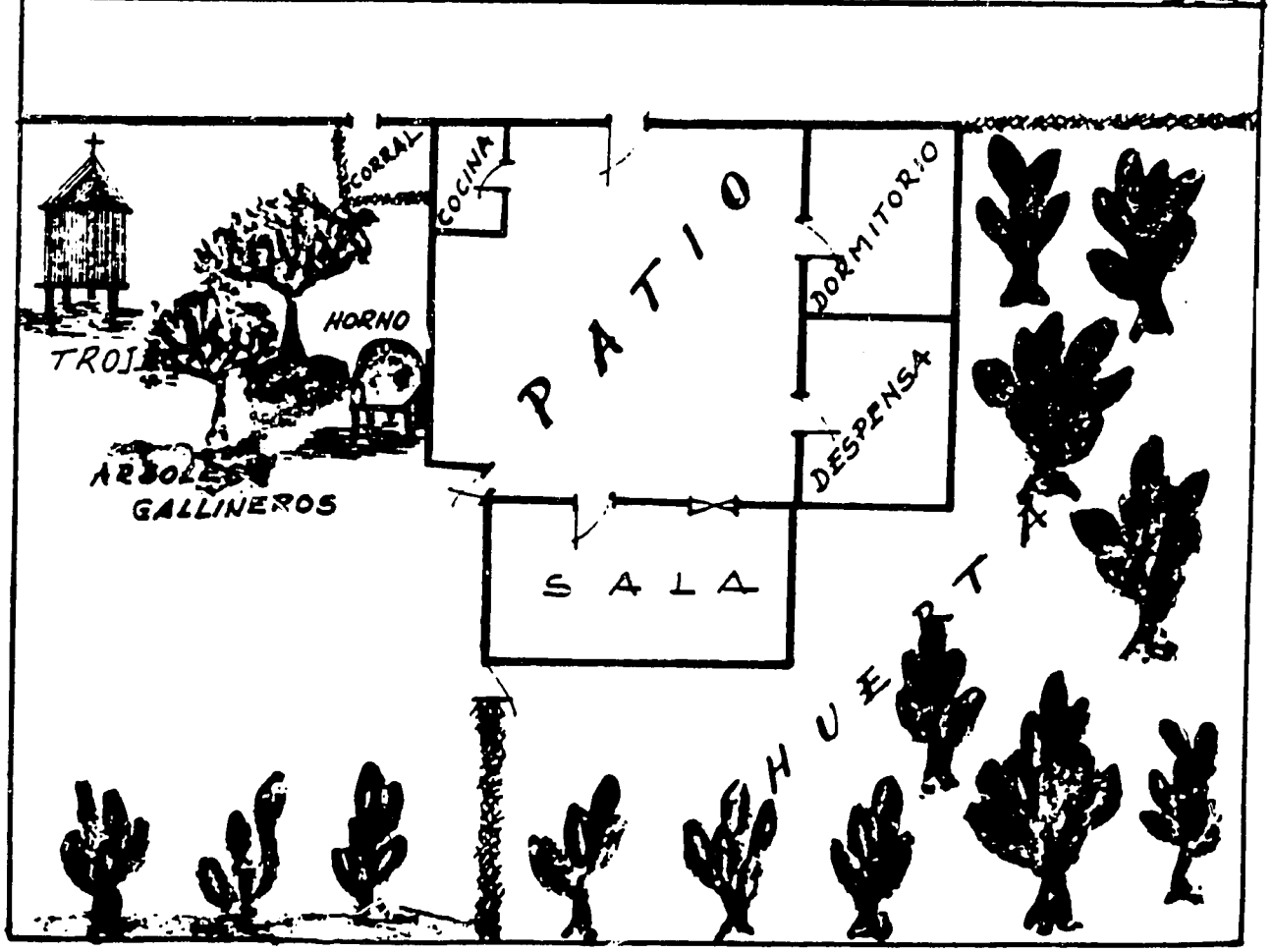
BEDROOM: Known as the sala-dormitorio, the bedroom is usually without windows. In a few families one might find a metalic cot or the existence of a poyo, a bed standing off the ground built of adobe bricks and covered with a matress. Normally, however, family members sleep on the ground on sheep or goat hides and cover themselves with a blanket. There are no closets for clothing. The few articles of clothing owned by family members are hung from roofbeams or nails stuck in the walls. Most families also keep a trunk of some kind in their bedroom for storage of certain valuables. For many bedrooms there exists a doorway but no door.

STOREHOUSE: The storage room or dispensa is used to store tools, seed, and produce not located in the troje. It tends to be a multi-purpose room, particularly in the homes of newlyweds, where it serves as a bedroom as well; or looked at from the other direction, the bedroom is very often used as a despensa. Indeed, the poyo itself is usually a storage bin where potatoes or wheat are kept. In many homes where chicha is made, the dispensa is the room where the beverage is stored to ferment.

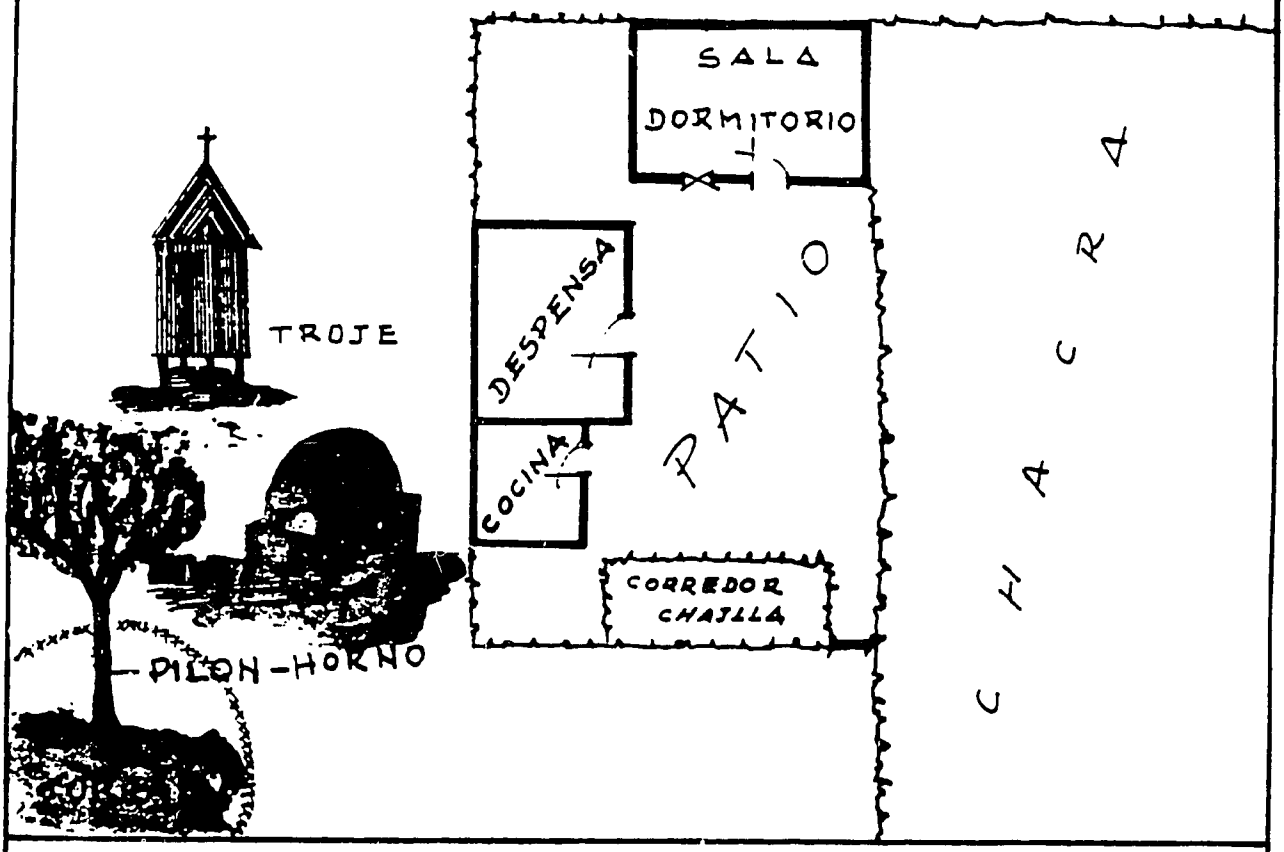
CORIDOR: The corredor is usually formed by an extended roof made of sticks which provides shade from the bright sun. It is open, facing the patio, and serves as a well-ventilated work area. Here is where many women do their weaving, seed selection, mending of clothes, mastication of muco (fermentation agent for chicha), and many other tasks requiring their presence at home.

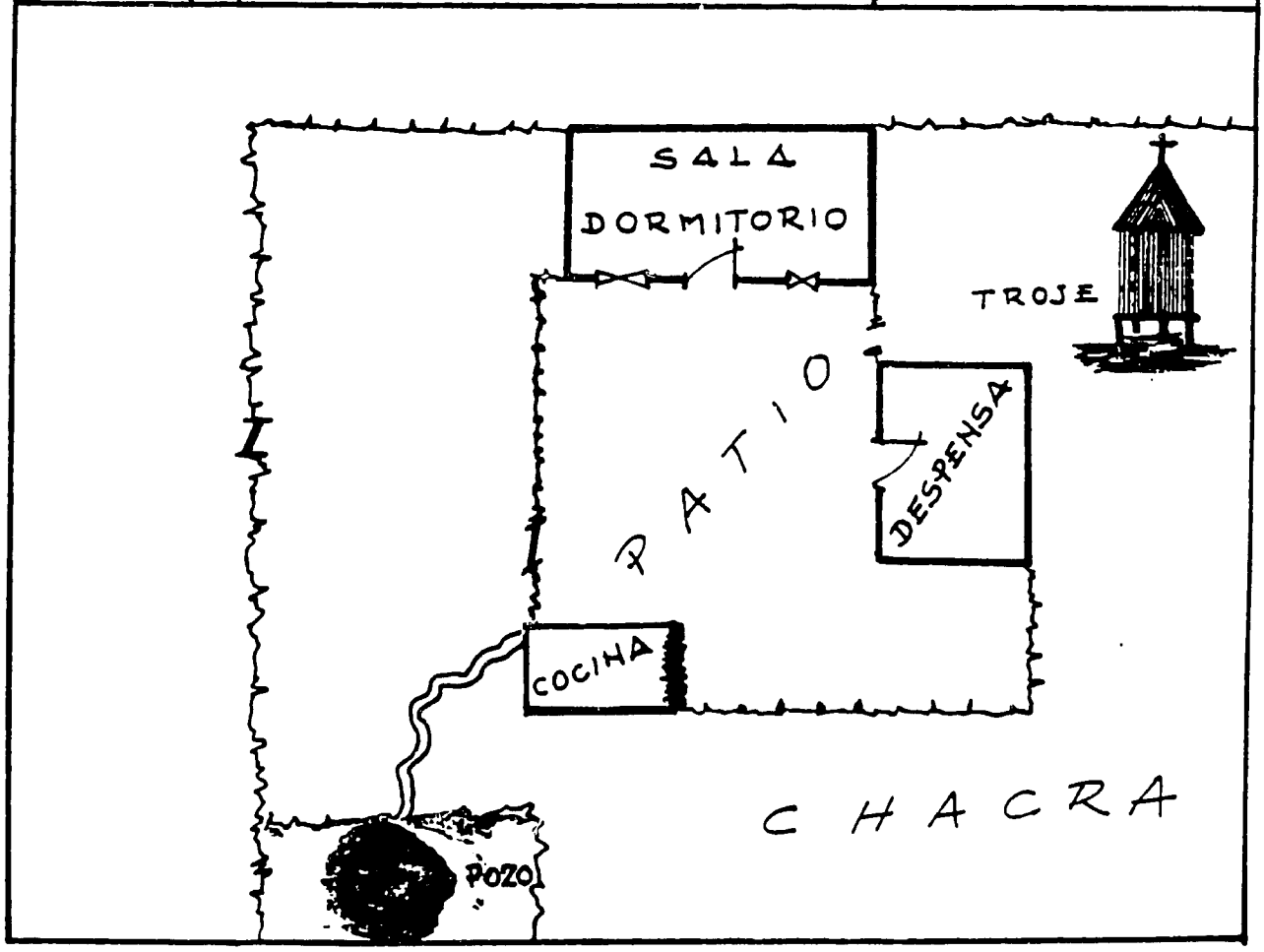
ANNEXES: The principal annexes of the farmhouse in Puca Puca include the troje, the baking oven, livestock corrals, fencing made of woven branches, a small holding pond (which often dries up several months each year), and one or more shade trees. The trees also provide a nesting place for poultry, while in the lowest branches it is common to find a pile of fodder stored for future consumption by livestock.


VIVIENDAS EN PUCA PUCA
COCINA
DESPENSA
CUARTO DE ROPA
DESPENSA
PATIO
CORREDOR DORMITORIO
TELAR
CORRAL
SALA DORMITORIO
TROJES
CHACRAS


CORRAL
COCINA
PATIO
DORMITORIO
HORNO
TROJ
DESPENSA
ARBOLES
GALLINEROS
SALA
HUERTA

VIVIENDAS EN PUCA PUCA



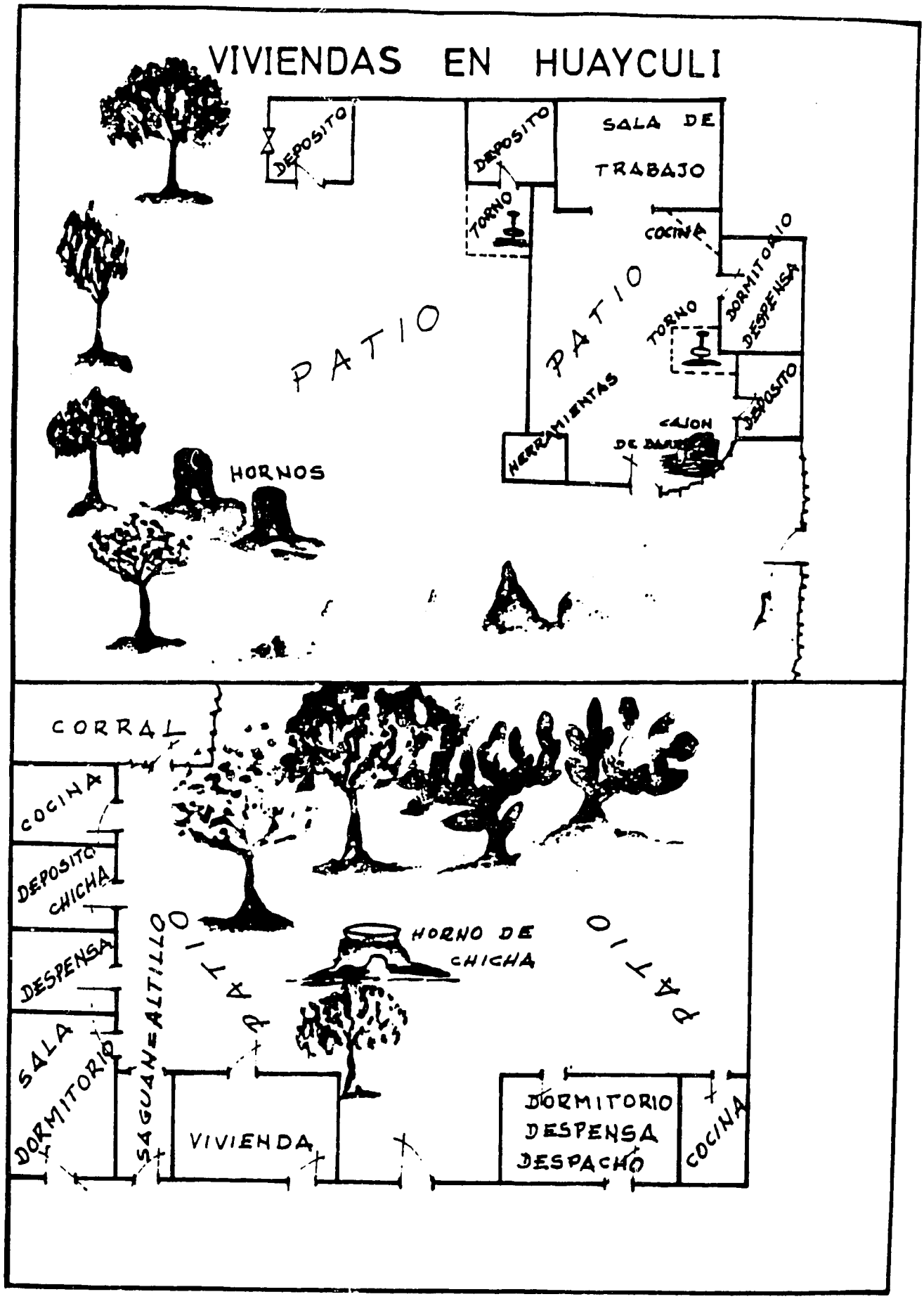


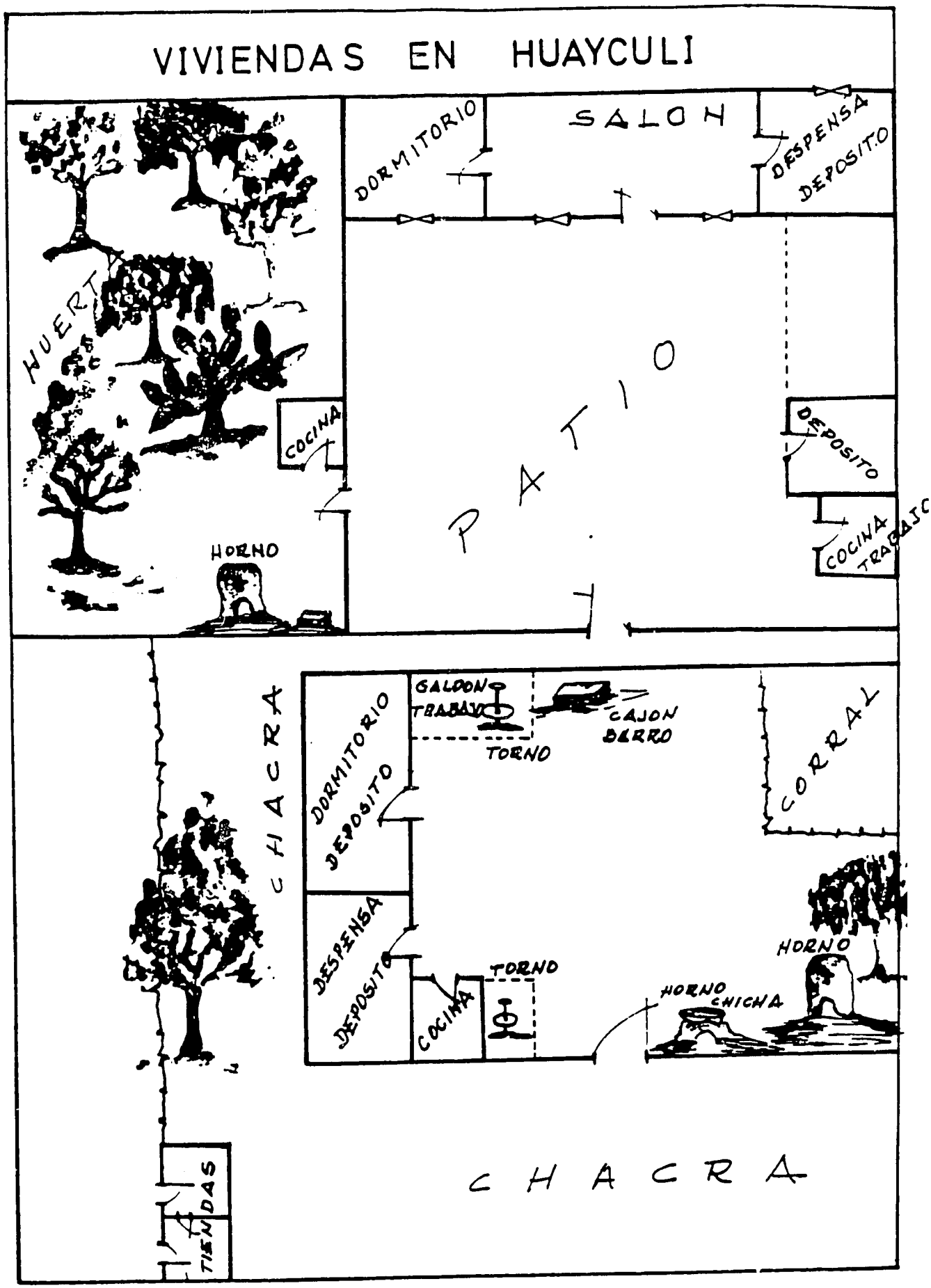
HOUSES IN HUAYCULI

The housing pattern of Huayculí is much less scattered than in Puca Puca. The homes are generally located along the roads in and out of town, some built side by side, and most structures are quite old. The general architecture of the houses follows a colonial style with very high walls, small windows, and tile roofs a media agua (slanting in one direction only). For the most part the homes display the slow deterioration resulting from several generations of continuous occupancy. Where houses have become inhabitable, they were torn down and rebuilt on the original foundations but with lower walls and sometimes preserving the original rooftiles. The older dwellings all share a common feature of having one room opening onto the road which serves as a tienda (store). Many of these rooms still are used for commercial purposes--like the sale of chicha--even though the present-day residents do most of their selling and trading of wares and produce outside the community. There is a marked tendency for each home to have an interior patio that is almost completely enclosed on three or four sides--perhaps in search of privacy to develop their semi-secretive pottery enterprise.

Houses in Huayculí do not have dining rooms; eating is done in the kitchen. But most dwellings have a sala (for entertaining visitors, etc.) or some kind of multi-purpose room which serves as a store, guest room, or extra storage area. Homes usually have two kinds of storage facilities. The first is the despensa (larder), which is mainly used for the storage of produce and agricultural tools. The second is the deposito (depot), where finished ceramics are stored and packed for transport. All the rooms mentioned above doors but very few have windows.

Most Huayculí families are potters, so in some corner of the patio one will find their potters wheel (or perhaps two). In another is the cajón where they stamp their clay. Outside the patio itself, perhaps in the adjacent garden, one finds the pottery oven and (sometimes) the caldron where chicha is boiled. Some houses have a small livestock corral which is either next door to the kitchen or placed as far away from the living quarters as possible (chicken pens versus pigs and sheep). Every house has several shade trees. Although not shown on the house plans presented below, some homes also have wells .


VIVIENDAS EN HUAYCULI
DEPOSITO
DEPOSITO
SALA DE TRABAJO
TORNO
COCINA
DORMITORIO
DESPENSA
PATIO
PATIO
TORNO
DEPOSITO
HERRAMIENTAS
CAJON DE
HORNOS
CORRAL
COCINA
DEPOSITO CHICHA
DESPENSA
SALA
DORMITORIO
SAGUAN=ALTILLO
PATIO
HORNO DE CHICHA
PATIO
VIVIENDA
DORMITORIO
DESPENSA
DESPACHO
COCINA


VIVIENDAS EN HUAYCULI
DORMITORIO
SALON
DESPENSA
DEPOSITO
HUERTA
PATIO
COCINA
DEPOSITO
COCINA
TRABAJO
HORNO
CHACRA
GALDON
TRABAJO
TORNO
CAJON
BARRO
CORRAL
DORMITORIO
DEPOSITO
DESPENSA
DEPOSITO
COCINA
TORNO
HORNO
CHICHA
HORNO
CHACRA
TIENDAS

HOUSES IN MELGA

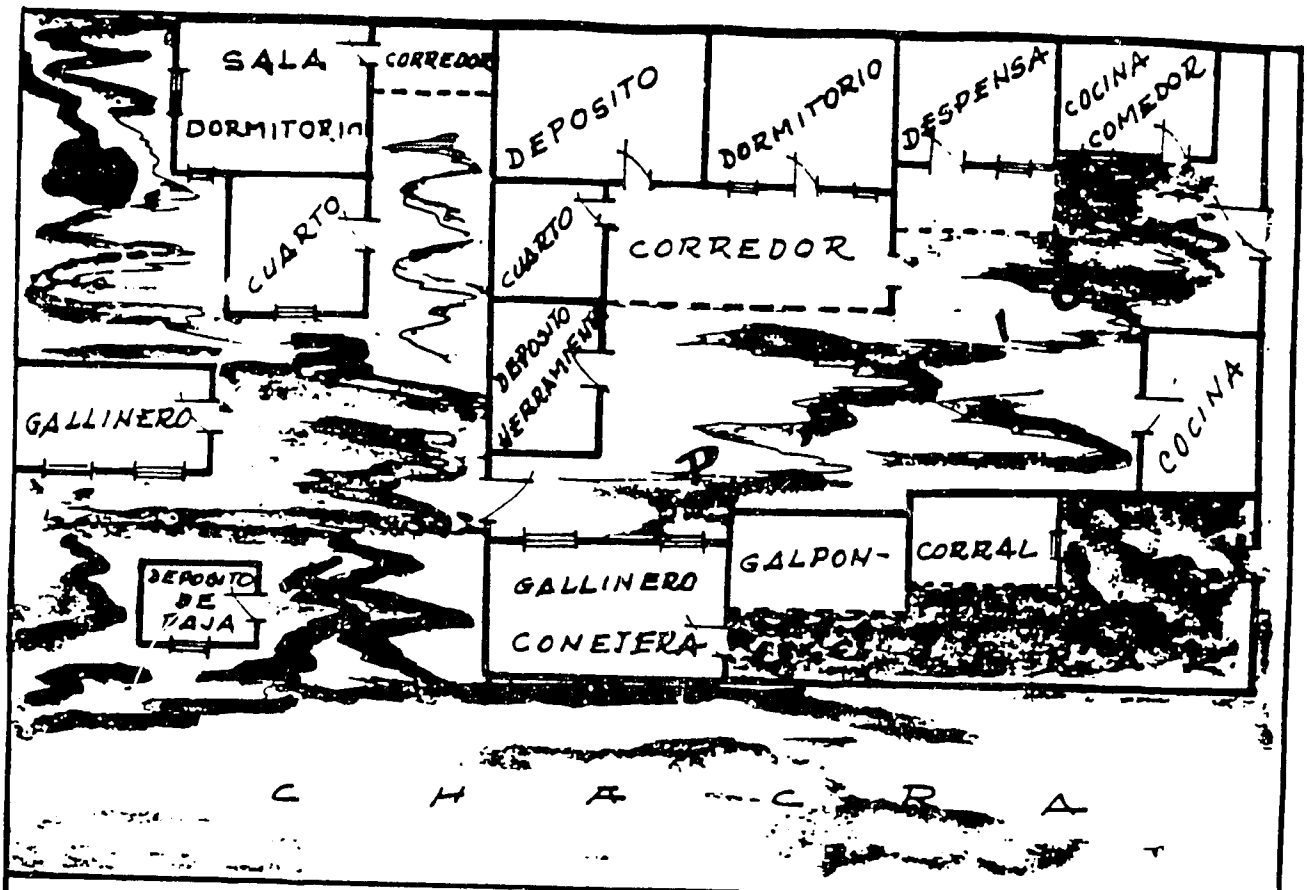
Housing in Melga has experienced a considerable evolution since the Agrarian Reform of the 1950's. Before the Reform, in the days of the original hacienda, families of resident laborers were each assigned a piece of land--known as the pegujal--on which to build their home. Due to the poverty of the laborers, and the insecurity of their tenure to the pegujales, the houses they constructed on these properties were very modest dwellings. The typical home consisted of one room only, which served the functions of kitchen, bedroom, and storage room. It was constructed with walls made of rock cemented with mud. The home had no windows and only a low opening for a door. The livestock corral was attached to the house itself and shared a common wall. The dwellings were roofed with wild straw brought from the highland zone.

After the Reform, with the distribution of land among the resident families and the expansion of irrigation resources, Melga has enjoyed a striking economic development. With improving economic opportunities have also come changes in living standards which might be most visably documented in terms of housing improvements. The one-room multi-purpose dwelling of the pegujalero has been generally replaced by multi-room homes, yet vestiges of the old customs continue. For example, there are still very few windows to be found. The corrals--in many cases--continue to share a common wall with the farmhouse. And the multi-purpose room of old, although no longer used for cooking, has been expanded into a much larger multi-purpose room referred to as a sala. Most houses in Melga have added what is called a corredor: a long, roofed shed providing protection from the sun and space to accommodate large quantities of potatoes that must be selected for market sale. Homes in Melga appear to offer far more built-in storage capacity than in either Huayculí or Puca Puca.

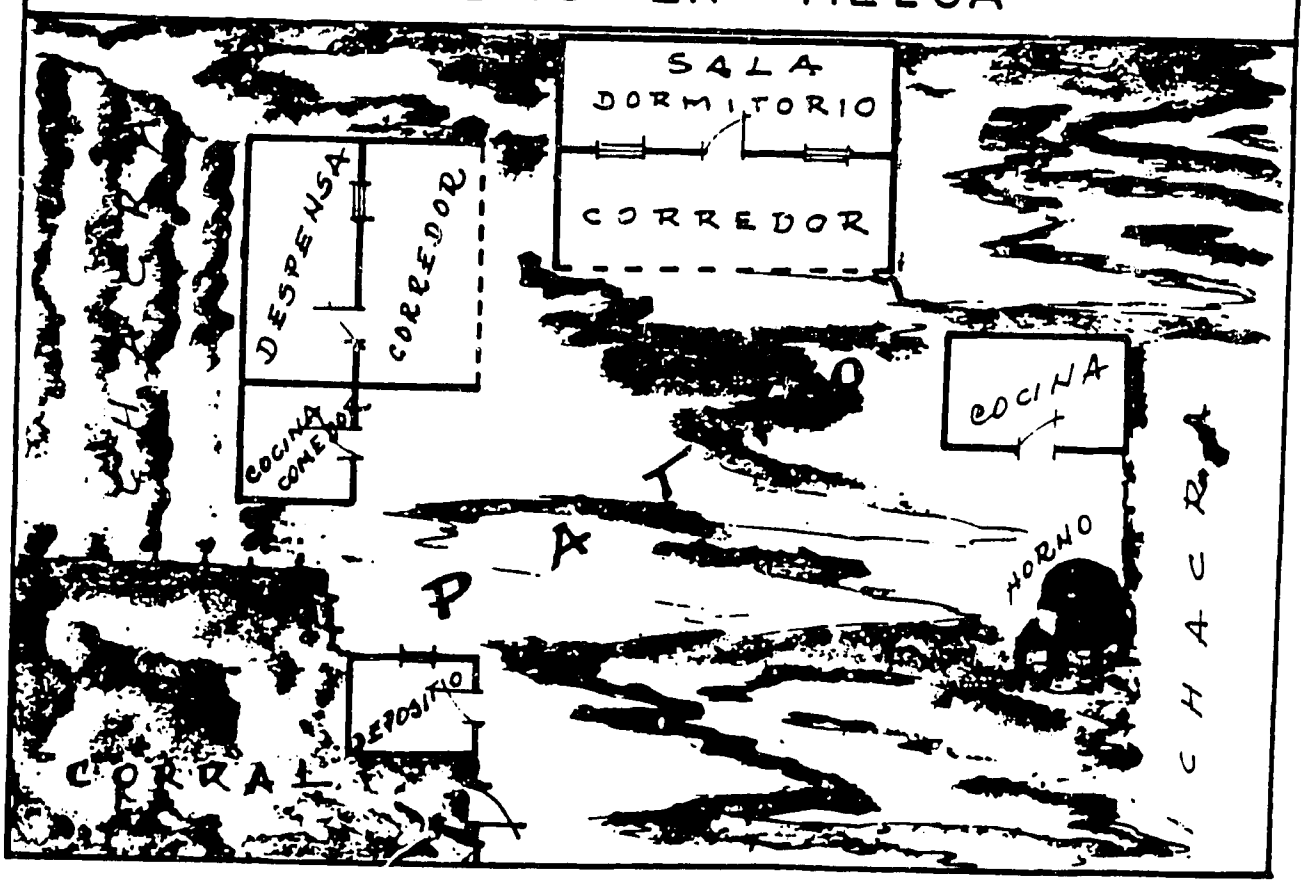
The characteristics described above refer to the dwellings built on the sites of the original pegujal huts of three decades ago. But perhaps an even more impressive indicator of linked economic and social improvements is the fact that most families in Melga have two homes. Their second dwelling is located in the Aldea Rural (Rural Village), a modern housing project built at the foot of the community about one hundred meters from the paved Cochabamba-Chapare highway.

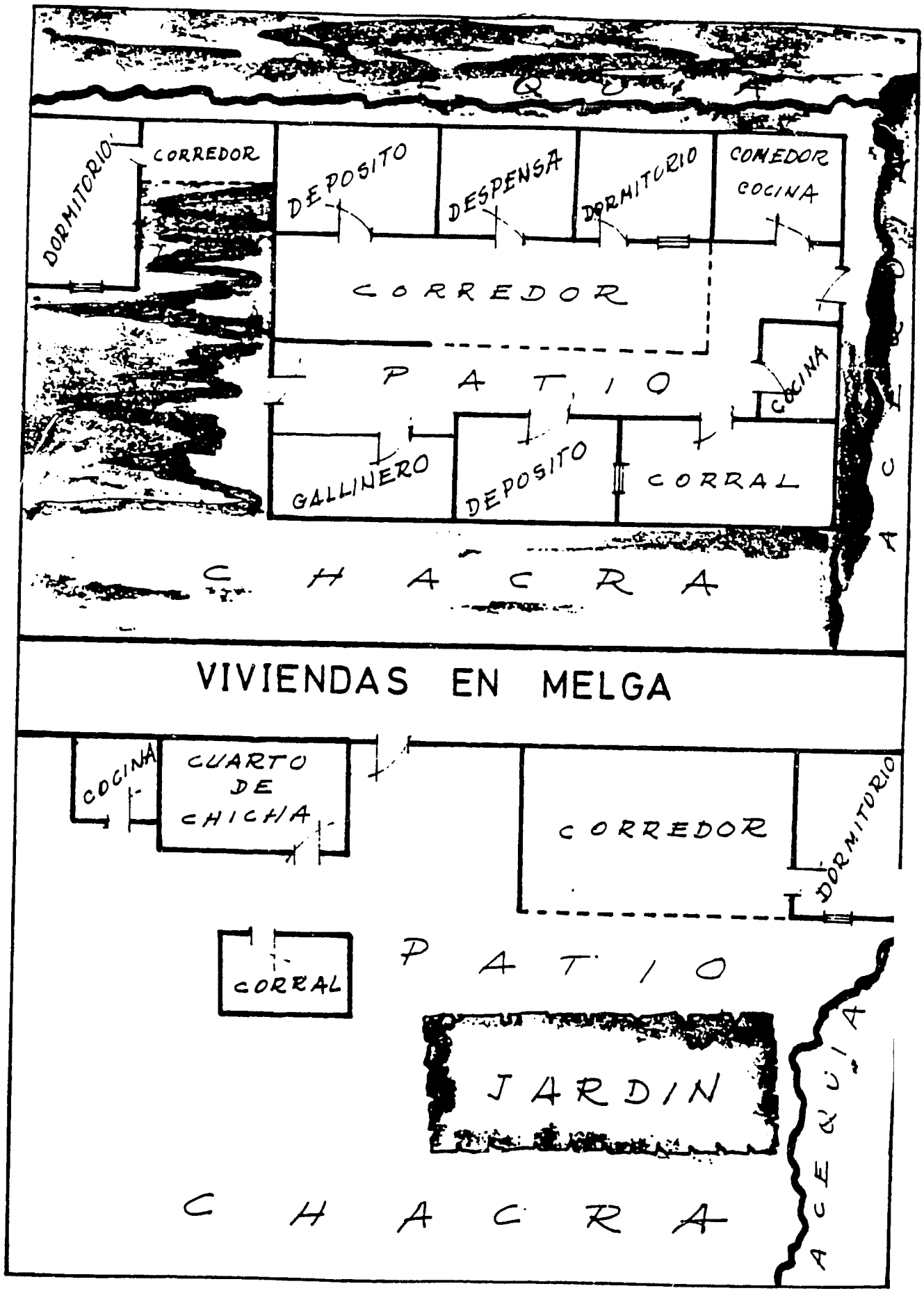
The Aldea Rural was the result of a housing program sponsored by an international institution beginning in 1970. A housing cooperative was organized at that time and members began saving their money. A property donated by the owners of Hacienda Melga was divided into 101 house lots of 280 square meters apiece. These in turn were organized into about ten hexagonal units of ten lots each, with all the lots facing onto a common plaza. Each lot is designed to accommodate a three-room house with a patio area behind it. The houses themselves are built of adobe bricks and constructed by the homeowner following a standardized plan that allows for a choice of different roofing materials (ceramic tile, asbestos sheets, cement tiles). It is noteworthy that the houses have a pair of windows in each room and are very well illuminated. However, some customs die hard in Melga, for some families have (at least temporarily) covered their windows with adobe bricks. Others are beginning to modify the standardized design by adding a second floor or by building a roofed shed out into their patios.

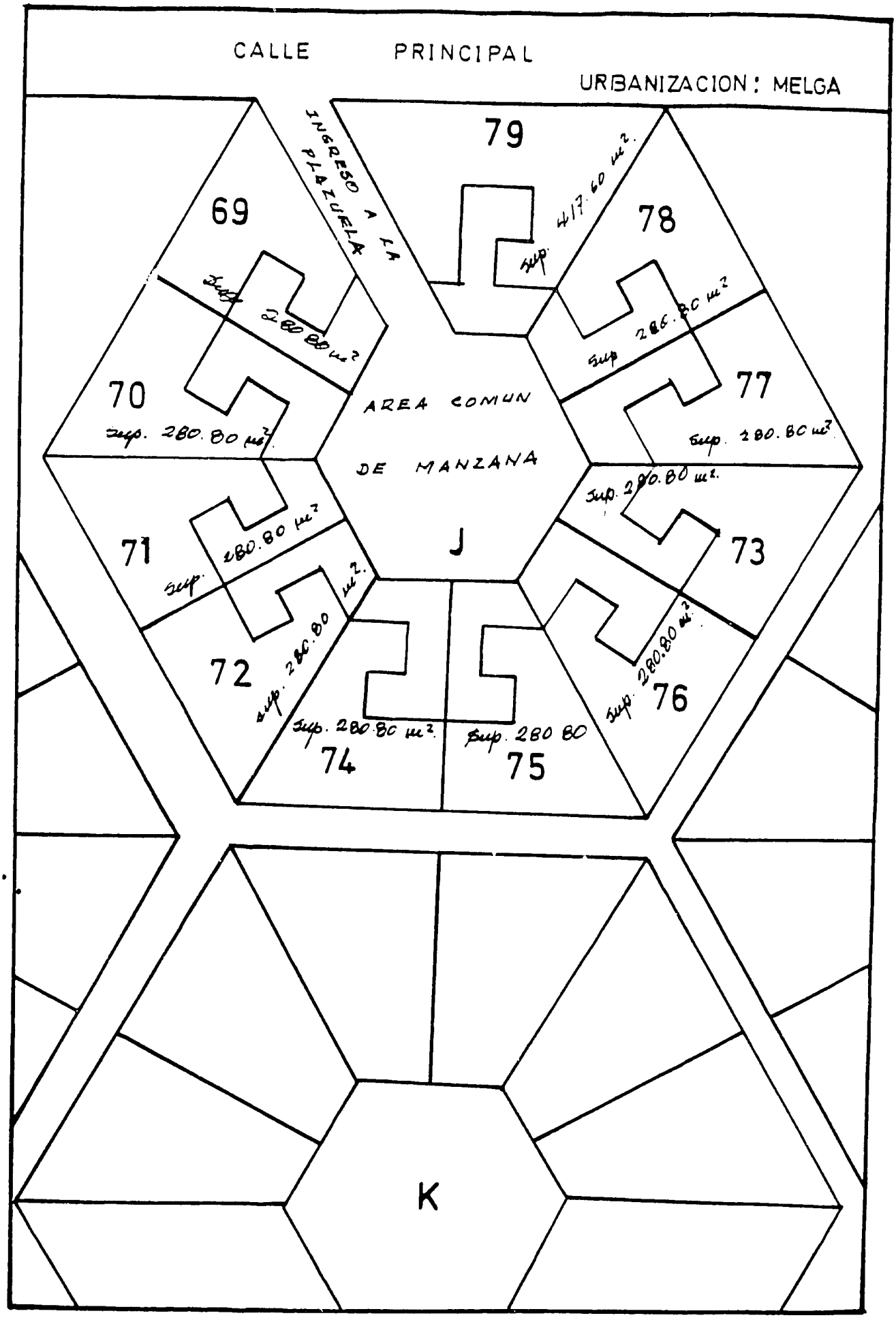
The importance of the Melga housing project is that it represents one of the first experiments in the Valleys region to neuclearize farm families in a single settlement. The urbanization has brought its residents the benefits of potable water, electricity, letrines, a health post, a modern educational center, recreational areas, and a church presently under construction.



VIVIENDAS EN MELGA




QUEBRADA
DORMITORIO
CORREDOR
DEPOSITO
DESPENSA
DORMITORIO
COMEDOR
COCINA
CORREDOR
PATIO
COCINA
GALLINERO
DEPOSITO
CORRAL
CHACRA
ACEQUIA
VIVIENDAS EN MELGA
COCINA
CUARTO DE CHICHA
CORREDOR
DORMITORIO
CORRAL
PATIO
JARDIN
CHACRA
ACEQUIA


CALLE PRINCIPAL
URBANIZACION: MELGA
INGRESO A LA PLAZUELA
79
Sup. 417.60 m²
69
78
Sup. 280.80 m²
Sup. 286.80 m²
70
Sup. 280.80 m²
AREA COMUN
DE MANZANA
77
Sup. 280.80 m²
Sup. 280.80 m²
71
Sup. 280.80 m²
J
73
Sup. 280.80 m²
72
Sup. 280.80 m²
Sup. 280.80 m²
76
Sup. 280.80 m²
74
Sup. 280.80 m²
75
K

CHAPTER VIII.
HOLIDAYS AND CELEBRATIONS

Despite the drudgery, poverty, and dangers of rural life, farm families manage to celebrate frequently. Their festivities are seldom conducted with household members alone, but almost always include their relatives, friends, and neighbors. These parties serve to dramatize the very high degree of interdependence among members of the rural community. One can not survive without friends. Conversely, sustaining friendship networks requires "maintenence" investments. And those who enjoy greater affluence than others are expected to share their blessings with their neighbors and the community at large. One does not buther an animal or prepare a special dish without thinking of sharing it with friends. One only prepares chicha to serve dozens of people. One does not honor departed relatives, or mark livestock, or get married, or celebrate the harvest without the presence of many community residents. Nowhere does there exist a more perfect expression of the communal and basically non-materialist values of rural people than in their holidays and celebrations.

Such is the wealth of folklore and tradition in the Valleys Region that it could easily be a book unto itself. In this chapter we attempt to provide only a small sample of that richness. The chapter begins with a description of perhaps the two most important celebrations of the year for rural families: All Saints Day and Carnival Week. Next is presented several secondary holidays including Easter, Santa Vera Cruz, San Isidro, and Saint John's Day. We then present two examples of celebrations honoring patron saints--Señor de Romasa in Huayculí, and Virgen of Melga. The chapter concludes with examples of ceremonies that do not have fixed dates but which are common occurances every year. They include marriage, death, a child's first haircut, and libations to the Earth Mother.

ALL SAINTS DAY
(TODOS LOS SANTOS)

INTRODUCTION

In Quechua culture there does not appear to exist an explicit distinction between life and death. The event of dying is viewed as a transition to another state of existence, but not as an absolute end to one's being. The spirit of the deceased is believed to linger for many years —able to observe the living, take note of how seriously its death was mourned, and able to dispense reward or punishment to the survivors. In rural communities a death is therefore bound to result in elaborate celebrations, both immediately following the death itself and at standard intervals thereafter. All Saints Day (November 1st) marks the beginning of what may be the single most important celebration of the rural social calendar. It signifies the moment when "fresh" spirits (those who died within the last 2-3 years) actually mingle again with, and are honored by, the living. It is a time for demonstrating family cohesion, for visiting friends and relatives, for displaying social and economic status, for measuring the prestige of the deceased. Children do not go to school. Teen-agers engage in courtship. Godparent relationships are sealed. Many rural families must save for months, or go into debt, to finance the heavy expenditures associated with the death-honoring rituals. The festivities associated with All Saints Day may last several days, and even weeks.

PREPARATIONS

The typical rural community will have at least 10-20 families who are honoring fresh spirits. These families are expected to prepare mesas (banquets featuring the deceased's favorite dishes) and serve abundant chicha and offer visitors bread as payment for their prayers. No matter how poor, the family must stockpile considerable supplies of wheat flour, eggs, lard, salt, and sugar for making urpus or ritual breads fashioned in the shape of babies, animals, and other objects, the baking of which begins in the last days of October. The household must also reserve adequate amounts of cornmeal to make chicha. A pig may be fattened exclusively for this holiday, and perhaps poultry, lamb, and beef will be needed as well. Many households must start their preparations at least two months in advance.

FIRST DAY, NOVEMBER 1ST

Two entire days are devoted to celebrating the dead, and visiting families who have prepared mesas. November 1st is known as the "Day of Live Saints". It is devoted to preparing the banquets honoring the deceased, and receiving the visit of the spirit itself. Also known as the tumba (tomb), the banquet is prepared on top of a table covered by a wool mantle. The table must contain (1) a crucifix or an image of the Virgin Mary; (2) several dishes of the deceased's favorite foods; (3) a variety of alcoholic beverages (chicha, beer, wine, grape brandy); (4) a variety of urpus shaped like birds, animals, dolls, etc., and (5) panalas or sugar cubes--colored rose and white--to sweeten the chicha. When the death is very recent, the banquet should include boiled eggs, pork, chicken, and beef dishes.

The preparation of the tumba must be completed by noon, because that is when the spirit is scheduled to arrive. The presence of the spirit is announced by a slight breeze. Family and relatives gather around the table and pray. Throughout the rest of the day neighbors arrive to join the praying for the deceased. Their prayers are rewarded with chicha, urpus, and food. In the evening it is customary for bands of roving children to visit one mesa after another throughout the community. At each tumba visited they sing or recite prayers for the deceased, gradually accumulating large amounts of urpus which they carry in sacks from one home to another.

SECOND DAY

The visiting and praying continues until noon of the second day. At this time the banquet is dismantled and all remaining food is distributed among the guests. Nothing edible should be left behind, and for this reason a padrino (sponsor) is usually nominated to take responsibility for the distribution. Following the dismantling of the mesa a meal is served to guests, and continued libations of chicha. Then, about 2 P.M. all relatives and other visitors are invited to visit the grave of the deceased. In effect, the trip to the cementery is to accompany the spirit back to its resting place. For this reason November 2nd is known as Alma Cacharpaya or farewell of the spirit.

Similarly to the banquet in the home, the gravesite is typically adorned with a mantle, dishes of food, bread, and fruit. Crowns of flowers and black and purple crepe paper are also used for decorations. The visits of roving prayer groups continue, with the children collecting their payments in bread. There is considerable drinking of chicha and other alcoholic beverages by the adults. These celebrations continue until the early evening.

Residents of the community of Melga spend November 2nd in a more comic fashion. Different individuals dress up in costumes representing death, devils, and lost souls. Mock marriages and baptisms are performed as well. In the former case, teen-age couples are captured by surprise and taken before a clown dressed as a priest. For mock baptisms, babies made of bread--called tanta huahuas--are adorned with a baptismal smock, taken before a Registrar to record its birth, and then taken to the "priest", who baptizes the bread doll with a mixture of salt, ashes, and dirty water. The comedians who perform the major roles in these mock-rituals are usually paid handsomely, such that a comic wedding or baptism might be more expensive than a real one. These ceremonies also serve as occasions for the exchange of bread to show one's respect (see Fourth Day, below).

THIRD DAY

In Puca Puca the first two days of Todos Los Santos is usually devoted to mesas and house visits within the community, but on the third day residents travel to Aiquile to visit the cementery there and adorn the tombs. In addition to roving coruses of 5-6 children each--singing for bread--there are also musicians for hire, charging about 100 pesos (US$4) per song and offering more affluent celebrants an opportunity to demonstrate their economic status.

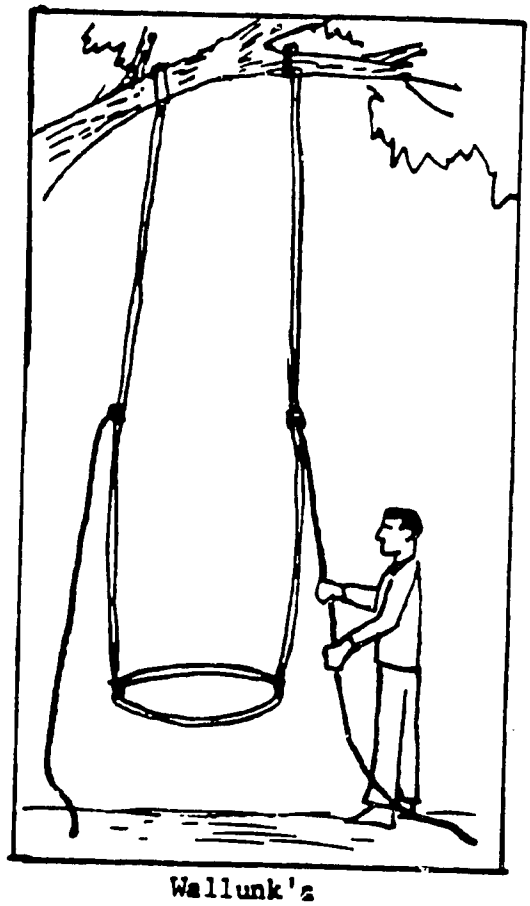
FOURTH DAY AND BEYOND

A common practice in the Valleys Region is the setting up of swings called wallunk'as, known in Puca Puca as khochis. Each community has its own special form of organizing the procedings, but the following description taken from Puca Puca may be considered typical. Each year a different swing sponsor is named. He is expected to arrange for musicians, prepare chicha, set up the swing, and even charge admission. The swing parties begin every afternoon after 2 P.M.--announced by the firing of a rocket--and last until about 10 O'clock at night. These fiestas are called miskha carnaval (first carnaval) and may continue on a daily basis for almost two months or until just a month before the official carnaval celebration in February.

The wallunk'a is a swing made of rope. It has a looped seat to which a cushion is attached and hangs about a meter off the ground. The height of the swing is usually 8-10 meters. Reins are attached to each rope on both sides of the swing to facilitate the work of two assistants whose job is assist the passenger in getting started, but also to keep the swing in motion even if the passenger wishes to stop.

Once in motion, the passenger is elevated to considerable height. Before he or she is allowed to descend, the passenger must recite some original verses or sing a song. This festivity is very popular among young people. Teen-agers of both sexes attend the wallunk'a in their very best clothing. Guests must also contribute food or beverage or pay an admission fee to ride on the swing, thus helping to defray the costs of the party.

Another activity which is combined with wallunk'a ceremonies is the giving of bread dolls--thanta huahuas--to people who are sought out as compadres (godparents). The gift of a bread doll is a sign of great respect. It means that between donor and recipient there can not be any fighting or ill will. Neither can the two be married. When a young woman wishes to discourage the advances of a suitor to whom she is not attracted, she will "escape" by giving him a bread doll.



Wallunk'a

CARNIVAL

Along with Todos Los Santos, Carnival is one of the two most important celebrations of the year in rural communities. It is a time for giving thanks to the earth for the approaching harvest, for scaring away bad spirits, for social visits among relatives and friends, and a time for simple rejoicing. Carnival celebrations last for an entire week. Children studying far away at school, or sons and daughters who reside in distant communities, will almost certainly return home to spend this holiday. Each community celebrates carnival in a somewhat different way. In Puca Puca, carnival involves extensive visiting among neighbors, the consumption of huge amounts of chicha, and the marking of livestock. In Huayculí, band of organized musicians roam from home to home and community to community singing improvised lyrics in exchange for food and drink. The dominant feature of Carnival in Melga is the "potato dance".

CARNIVAL IN PUCA PUCA

Carnival Week begins on the second Sunday of February. At the Aiquile market rural families buy their provisions for the many days of celeration that lie ahead. There is dancing in the streets and water throwing. Unless the family has just suffered a death or finds itself in acute economic distress, every rural household will prepare chicha and bread. It is also customary to slaughter a lamb or a goat for the preparation of the special holiday dish known as thimpu, a meal of boiled meat served with rice and potato followed by a meat broth. The making of chicha is organized among families in a staged fashion so that supplies will be available for at least a full week. The dominant activity consists of visits to neighbors. Folks dress up in their very best clothes and in groups go "looking for carnival" from home to home. It is during Carnival Week that many familie choose to conduct their k'illpidas or marking of livestock (see Chapter IV, pp. 181-2).

Another celebration associated with Carnival is the khopuyo, a fiesta in honor of the cross that is usually celebrated on Ash Wednesday or the next day or two. The sponsor of the party finds a naturally-grown tree branch shaped in the form of the cross. The cross is adorned heavily with corn, bread, gourds, and fruit. It is taken to the church in Aiquile for a mass. Then the cross is returned to the home of its owner, where a party ensues. Any and all musicians in the neighborhood are expected to attend and compete with each other in the singing of improvised lyrics. If these performers are not served generous amounts of chicha and food their host is criticized for poor hospitality. At

day's end the cross is passed to another family, which will be responsible for giving a similar party the following year.

A variant on the khopuyo is the fiesta for "forgotten saints", or persons who have met accidental death. When a person dies by accident, members of the survivor's family will erect a cross or altar at the scene of the tragedy. A second cross is taken to church, blessed, and brought home to "replace" the deceased. This honoring of the dead is expected to result in favors bestowed by the spirit. If the spirit is generous in benefits, the gratitude of the survivors is expressed by organizing a pucara or party in its honor. On the date commemorating the accident, the forgotten saint's cross is taken to church for a mass to be said, them returned home for a party.

CARNIVAL IN HUAYCULI

Carnival festivities in Huayculí are similar to those in Puca Puca, with emphasis on visits to neighbors and nearly continuous drinking of chicha. But being more urbanized, musicians in Huayculí are much more likely to use electronic instruments and battery-powered record players rather than the traditional charango (mandolin) and guitar and sundry reed flutes. In Huayculí it is more common for groups "searching for carnival" to wander outside the community, or receive strangers from neighboring locales. For this reason the daily round of parties are events organized by special committees, and all alcoholic beverages consumed by guests must be purchased.

CARNIVAL IN MELGA

In Melga, carnival week begins on the third Monday of February with most families making the trek to their distant rainfed potato plantings in the highland district (see POTATO DANCE, below). The following day is called Martes de Ch'alla or Libations Tuesday and is devoted to the blessing of all household assets of significance--tools, clothing, furniture, appliances, animals, and the home itself. Burnt offerings, toasts with alcohol, and the throwing of confetti and streamers over the blessed assets characterize the celebration, which sometimes is conducted as strictly a family affair and other times is a party to which relatives and neighbors are invited.

On Wednesday there occurs a contest of traditional dance groups known as taquipayanakus who congregate in a selected community to dance most of the day. The groups are outfitted in distinctive costumes or the finest traditional clothing. Prizes are usually awarded to the group which has traveled from the most distant community, a practice intended to incentivate future attendance. For example, in 1981 the taquipayanakus

dancing at Melga came from Uruchi, Santa Rita, Ilori Grande, Rodeo, Colomi, Aguirre, Chaupi Melga, and Chimpa Melga. The prizes were 1,000 pesos (US$40) for first place, 500 pesos (US$20) for second, 400 pesos (US$16) for third, 300 pesos (US$12) for fourth, and 200 pesos (US$8) for fifth. Three ten-liter tins of chicha went to the groups that did not receive a cash prize.

POTATO DANCE
(FIESTA DEL PAPA TUSUCHI)

The purpose of the Potato Dance is to render tribute to the Earth Mother for the prospect of a bountiful harvest, because by February the crop is old enough to reveal its quality and will have passed through the period of greatest risk. This is a time to visit one's plots, and those of neighbors, to share in general celebration. The dance is held on the third Monday of February. The previous Sunday one will find local markets crowded with people buying provisions for the event. Their purchases include ingredients for burnt offerings such as incense, llama grease, and misterios (mysteries) or tiny wafers in myriad shapes and colors, particularly those resembling toads or snakes, which symbolize the soil. Dyed wool is also a prerequisite, for it is used to wrap the boundaries of the fields being celebrated. Of course, a variety of alcoholic beverages in considerable abundance will also be required, along with confetti, streamers, and rockets.

Participants--equipped with their guitars, charangos, flutes, and drums--must reach their respective plot by Monday noon. The first act is to conduct the burnt offering and sprinkle alcoholic beverages for the Diety. All present remove their hats, kneel, and pray. Then follows the invocation, for example: "Earth Mother, may your womb produce bountifully, may the house be filled with potatoes, and the harvest be the largest ever. Father Tunari, Chief Tuty (spirits of surrounding mountain peaks), you also guard over us and protect us from the elements." Following the invocation, bottles of beer are shaken and sprayed all over the plot. Then other alcoholic beverages are sprinkled about. The participants drink very little, only symbolically, for the beverages are mostly reserved for the Earth Mother. Confetti is scattered throughout the plot, and the potato plants are decorated with streamers. The celebration proceeds from one plot to another. Half way through the afternoon a special meal is eaten.

The dancing occurs both during and after the decorating of the fields. Couples commence the sunthida, which consists of running and jumping with great leaps about the field. It is done, supposedly, in order to make the potatoes grow larger. Then flags are placed in different

locations about the fields, or the celebrants hold them aloft as they dance. The flags symbolize the banners carried by the Incas when they returned home from their military triumphs. After completing the ceremonies at its own plots, families visit each others fields. Groups of singers and dancers, improvising their own lyrics, move from plot to plot to add an additional dynamic quality to the fiesta. The celebrations continue until nightfall.

HOLY WEEK

The Thursday and Friday before Easter are sacred for rural families in the Valleys Region. On these days nobody is supposed to conduct agricultural labor. It is a time dedicated to prayer, to family activities, and ritual bathing. Because Holy Week arrives in April, many families have initiated their harvests. It is therefore a period for celebrating abundance, and is treated almost as a second Carnival in some instances.

Easter Week is a time of fasting as well as feasting. On Holy Thursday and Friday the rural family abstains from food until past noon. On these mornings the female head of household is expected to prepare from 6-12 separate dishes--reportedly each one in memory of one of the apostles of Jesus--and even the poorest family will prepare at least three dishes. The dishes do not contain meat of any kind, but often feature cheese and sauces. After mid-day the feasting can begin. Each member of the family must eat a portion of each dish, and each is served in a separate bowl or plate. All prepared food must be consumed; otherwise it is believed that God will not accept the previous fast. These special fasting foods are eaten to commemorate the Last Supper of Christ.

Following the feast, about 2 P.M. all members of the family go to the river to bathe and wash clothes. Washing on Holy Thursday is considered a means of cleansing the soul from all sin, because on this day the water is believed to be holy, blessed by the death of Christ. The same hold for Holy Friday as well. These are the only two days of the year that sinners can be absolved directly, without the intervention of a priest. On these days the rivers of the Valleys Region are exceptionally crowed with people and their banks sprinkled with multi-colored clothing and blankets being dried--a most unusual visual spectacle.

Holy Thursday and Friday are also reserved for special activities such as collecting honey, killing snakes, and collecting medicinal herbs. Following bees to their hives and removing the honey is nearly always done at Eastertime because honey is a traditional dish for consumption during Holy Week. Herbs collected during this period are believed to possess greater curative powers. Snakes are considered a symbol of the Devil or of general evil. It is believed that upon killing a snake at Easter all sins during the year are forgiven; however, few snake-hunters are successful because the serpents themselves seem to go into hiding this time of year.

In Huayculí there exists a Holy Week tradition known as khespichi or permitted theft. It is customary for people to visit their neighbors' fields to remove modest amounts of unharvested crops--usually corn, broad beans, squash, and fruit. Of each crop, three units at a time are stolen, the trio representing the Holy Trinity. Theft is tolerated on the day before Easter because, according to the local belief, Christ is dead on that day and can not see what is occuring. The act of khespichi is usually done by children.

On the evening before Easter Sunday, it is the custom for most rural families to slaughter a lamb. Of course, some households also will have prepared a large batch of chicha for Easter. Because of the expenditure involved, it is common to combine the Easter celebration with another social activity such as marking livestock, baptising a child, celebrating a mass, or visiting one's godparents.

On Easter Sunday most rural families make a special effort to attend mass, where they invariably purchase and light candles or donate flowers to their special saint. Teenagers go to great expense to show off their finest clothing at Easter Sunday mass. After mass, friends and neighbors congregate at certain homes where fiestas are being sponsored. Much like carnival week celebrations, the festivities involve groups of roving musicians singing improvised verses in exchange for food and drink. The partying and drinking sometimes lasts through the following Monday and Tuesday.

THE FESTIVAL OF SANTA VERA CRUZ

In the Valleys Region one of the most picturesque celebrations of the year is Santa Vera Cruz (Holy and True Cross). Held on May 3-4, the festivities take place at a special church located about ten kilometers outside the city of Cochabamba on the Cochabamba-Santa Cruz highway. Dominating the festival is a fertility motif. Attended almost exclusively by rural people, the faithful come from all over the region. Some ask for children, others ask for a stop to further growth of family size, and still others pray for the fertility of their livestock. The object of these prayers and solicitations is a venerable stone cross known as the Tatala.

The pilgrims congregate in a school yard near the church, where the cross is erected on an open-air altar. The yard--large as a town square--is surrounded by hundreds of kiosks for the sale of food, beverages, candles, and other supplies.

During the day of May 3rd the pilgrims arrive. Standing in line, they eventually have the opportunity to reach the altar of the Tatala, where a representative of the local parish blesses the pilgrim's candles by placing a holy mantle over the head of the believer. This ritual is conducted in exchange for a small cash donation to the church. The pilgrim then proceeds to locate a clearing in the school yard. There he or she lights a candle for each child in the family. As the candles burn, the pilgrim also burns a little animal manure mixed with wax and grease--an offering burnt in honor of the Tatala. These rites are conducted with remarkable devotion and sometimes last for many hours.

Connected with the rituals of Santa Vera Cruz is an act of fertility exchange. Below the altar of the Tatala is a hole. Women who pray for no more children bring little rag dolls decorated with brightly-colored yarn and bury them in the hole. Other women seeking a child collect the dolls and take them home. In the case of livestock there occur similar exchanges using clumps of wool, cow, horse, or pig hair, and the feathers of poultry.

At midnight a mass is given attended by the faithful each with a burning candle. Many pilgrims remain burning their candles all night long. Others slip into revelry, drinking, and dancing. By the early morning hours there begins a considerable amount of sexual promiscuity, particularly by women seeking a child. Some of these liaisons are consummated in the very shadows outside the walls of the nearby church, because the

location--being sacred--is believed to be more conducive to fertility.

In addition to the altar of the Tatala worshiped at Kilometer 10, many communities of the Valleys Region also have chapels constructed for worship of the cross. A common location for such chapels is at the very entrance to town. The cross is usually decorated with items related to the crucifixion--hammer, nails, ladder, lance, a rag soaked in vinegar, dice, and perhaps a rooster.

Furthermore, most rural communities have their own Calvary, where a cross is erected. These locations are usually the summit of the highest hill in the vecinity. Crosses made from a naturally grown tree branch or stump are the most respected, and they will be worshiped with great devotion. Some towns have crosses that are formed by the veins of a mineral within a larger rock. On May 3rd the local cross is usually taken from its customary location to the nearest church, where a mass is said, then returned to the community. In Puca Puca, for example, it is a two hour climb for the faithful to return their cross to its summit. The trip down and back up the mountain is conducted by dozens of worshipers, and the procession moves slowly to the beat of drums and the music of wind instruments. The restoration of the cross to its resting place culminates in invocations of the participants, who plead that their livestock herds be fertile and free of disease. The ceremony ends back in the community with drinking and dancing at the home of the pasante (host) responsible for organizing and financing that year's cross party.

SAINT JOHN'S DAY

Saint John's Day is celebrated June 25th. This is supposed to be the coldest day of the year. Saint John is also considered the patron saint of sheep, so the day has come to represent perhaps the most important date for honoring livestock.

Although customs vary from one community to another, the eve of Saint John's Day is a time for burning bonfires. In some places the fire is lit to symbolize people's desire to be protected from the cold. But in warmer climates, like in Puca Puca, bonfires are lit and allowed to spread; this symbolizes the rapid multiplication of herds. One fire is lit for sheep, another for goats, and so on. Some communities adhere to the custom of burning all night long, others for only a few hours after sunset. In a few instances it is not customary to burn on the evening of June 24th but rather over the following evenings--sometimes until Saint Paul's Day on June 30th.

Whether or not fires are set in the pastures, it is a generalized custom throughout most of Bolivia to light a bonfire near the doorstep of one's home. Frequently a liquor called anizado is prepared. The adults celebrate with drinking, dancing, smoking cigarettes, and chewing coca.

The following day--the saint's day proper--is devoted to "baptising" livestock. The symbolism involved is derived from Saint John's baptism of Christ. Using aniline dyes purchased at local markets, families make a kind of watery paint for annointing their animals. Arrangements are made with neighbors to avoid duplication of colors as much as possible. All livestock is splashed with a swatch of the same color. Even though the color wears off with time, the dye does manage to permanently stain a piece of skin. This makes the baptism a form of economical identification of animals. Even though a family employs ear cuttings (see LIVESTOCK, pp. 181-2), the dyeing of livestock will also be employed, and is in fact the most common form of marking animals.

Saint John's Day is considered an obligatory day of rest. It is often spent in neighborhood visits and social drinking with family and friends. Families with larger herds often have a small statue of Saint John. On the saint's feast day the statue is taken into town to hear a mass and to receive a priest's blessing. The return of the statue to its home is usually followed by a party to which the community is invited.

SAN ISIDRO

May 15th is the feast day of San Isidro, who is regarded as the patron saint of workers and also large animals such as cows, oxen, horses, mules, and burros. One of the places where celebrations to San Isidro are conducted is the community of Ch'aqui Kocha, about ten kilometers from Melga. The community has a huge plaza where large numbers of livestock can be assembled. Each year some 200 teams of oxen are driven on foot all the way to Ch'aqui Kocha to be blessed. The oxen are gathered in the center of the plaza while other kinds of livestock are lined about the edges. Following a mid-day mass, a priest emerges from the church and blesses all the assembled animals with holy water. Owners of blessed animals also rub the livestock's bodies with candles and burn them at the altar erected to the saint.

Following the blessing, oxen teams are yoked. The yokes are decorated with flags of different colors. The animals are annointed with alcoholic libations and their backs are sprinkled with confetti and streamers. Finally, a wooden plow--with a brand new plowshare--is attached to the yoke and each team of oxen begins to plow. A man guides the plow while a woman follows behind sprinkling ritual quantities of seed. This ceremony is most frequently conducted with new teams of young oxen who are just learning how to plow. It is said that if they are made to plow on San Isidro's day their training will go well and the team will be gentle, healthy, and a great pride to its owner.

After a while the teams are allowed to rest. Their owners drink and enjoy themselves. They annoint their other large animals as well with additional libations and confetti. Some participants collect as much as they can find of the seed thrown about in the plaza. This seed is considered to be blessed and is therefore expected to produce much more abundantly than normal seed.

On a typical celebration of San Isidro at Ch'aqui Kocha, several thousand animals will be blessed and honored. It is also a day known for its heavy drinking.

FIESTA OF THE SEÑOR DE ROMASA

The patron saint of potters is known as the Señor de Romasa, and he is also the patron saint of Huayculí. His day is celebated officially on October 3rd; however, the community begins its festivities on the evening of October 2nd and continues during three days of masses, processions, and presentations by folkloric dance groups. The social activities set in motion at the household level, particularly the drinking and entertainment of out-of-town relatives, may continue for an entire week. At least three-quarters of all resident families prepare chicha for this fiesta, and for at least 7-8 days all agricultural labor or ceramic activity comes to a total standstill.

In Huayculí, the personal and economic participation of all resident families is not only expected but obligatory. A collection is taken up for fireworks with a 50 peso (US$2) charge levied on each household. Every family must also contribute at least one dancer to a folkloric group for a minimum commitment of five consecutive years. Three dance groups of about 25 performers each are organized, each responsible for financing their own traditional costume. Each group has a steward who must hire a band, lodge the musicians, and provide all musicians and dancers with food and beverage during 1-3 days. Then there are three larger stewards who share the major sponsorship costs of the fiesta itself. Finally, there are groups of women entrusted with the decoration of community altars, carpenters who fix up the chapel, specialists in furnishing alegorical floats, and community authorities who must orchestrate the ambitious event with its myriad participants and complicated logistics.

THE DANCE GROUPS

Throughout Bolivia there are several well known folkloric dances, each with its own distinctive steps, music, and costuming. Those used in Huayculí are the Diablada, Caporales, Llamerada, and Cullaguada. Any young resident of the community between the ages of 3 and 20 years is considered a candidate for a dance group. The commitment of any particular dancer is specified for five consecutive years in a legal contract, and in 1980 the penalty for non-compliance was 5,000 pesos (US$200). Under the direction of their respective mayordomo (steward), the members of the three dance groups begin to meet and practice their routines beginning in August. For the three-day period of the fiesta itself, each dancer must rent their own costume at a cost of about 200 pesos (US$8).

The dance group's steward carries the heaviest burden. First, he must contract a band of musicians (from neighboring communities) at a cost in 1980 of about 5-6,000 pesos (US$200-240). Second, he must provide for their lodging. Third, he must have prepared 1-2 cargas of chicha, with an estimated value of 3-5,000 pesos (US$120-200). For each day of his responsibility, he must provide all musicians and dancers--perhaps over 35 people--with at least one and sometimes two special meals served with meat. All told, a steward's cost could run about 15,000--25,000 pesos (US$600-1,000) in 1980.

THE MAJOR STEWARDS

Then there are three major stewards of the fiesta. These are known respectively as the Mayordomo, Capitan, and Prioste. The occupants of these posts are designated a year in advance, because the costs are so heavy. In addition to also sponsoring, lodging, and feeding musicians for bands of their own, they must provide food and beverage for out-of-town visitors at private parties at their homes. They are also expected to make major community gifts, like repairs of a chapel, provide for the financing of alegorical floats, hire the priest and assistants, purchase additional fireworks, and provide transportation for guests. The posts are normally offered only to the wealthiest residents of the community, or successful ex-residents living elsewhere. Acceptance of the responsibility is an opportunity to share the pasante's affluence, to demonstrate socio-economic prestige, and to give thanks to Señor de Romasa for their prosperity and well-being.

OTHER PARTICIPANTS

Whether local residents or from neighboring communities, some 10-20 additional families "fulfill their promise to the saint" by sponsoring the decoration of altars and the church. In the four corners of the town square a separate altar is erected and taken down again for every one of the three days of public processions and dancing. The women in charge of these altars are called altareras. Each has her team of assistants to whom she must provide materials, food, and beverage. Each team competes with the others to create the most beautiful altar, and their relative success is the subject of considerable community observation and commentary. In addition to the altareras, other families contribute their skilled labor to decorating the church or the alegorical floats. During the period of celebration, dozens of merchants and vendors from outside Huayculí set up tents and kiosks surrounding the town square to sell food and beverages to the large numbers of visitors attracted by the event.

DESCRIPTION OF FIESTA ACTIVITIES

The celebration begins on October 2nd at 6 P.M. with a procession of the dance groups, bands, important guests, and the statue of the saint. At 7:30 P.M. there begins a fireworks display financed by a community collection. In 1980 the amount of 3,250 pesos (US$130) was spent on fireworks and the program lasted about an hour. The brevity of the show was a disappointment to local residents, who remember programs of previous years lasting until midnight. The difficult economic straits of fiesta stewards was blamed. Following the fireworks, the saint is taken to the home of the major steward for its velada or night-long observance. A band plays until very late. A good beginning on alcoholic beverage consumption is made. Thus ends the Vispera del Santo or Eve of the Saint.

The next three days follow a similar pattern. A rocket is fired at 6 A.M. to announce the dawn and the start of the festivities. The bands and dancers congregate at the church. The teams directed by the altareras begin to work feverishly on their respective altar decorations. The dance groups practice their routines with their bands. The wife of that day's fiesta sponsor completes the decoration of her respective alegorical float. Musicians and dancers are served a sumptuous meal, costumes are readied, and private merchants set up to serve the general public. In private homes each family feeds and otherwise entertains its out-of-town relatives. At noon a mass in honor of the Saint is given in the town church. During the ceremony the bands play different Bolivian songs. Following mass there begins a procession from the church around the square. It is led by the dancers, followed by their bands, then the priest, the statue of the Saint, other companions, and the alegorical float bringing up the rear. The procession stops before each altar, where dance numbers and prayers are offered. Following the procession the statue of the Saint is returned to the church. The major sponsors now retire to their homes to attend large numbers of guests with food and drink. For the rest of the afternoon the different dance groups alternate with each other in performing their studied and well-practiced programs. They receive one long rest for a meal, but generally the dancing continues until the performers are completely exhausted. One of the miracles of the celebration is that the dancing does continue for three days.

INTERVIEW WITH A DANCER AT THE FIESTA OF THE MELGA VIRGEN

The patron saint of Melga is La Virgen de Melga, whose celebration occurs October 17-19. The story goes that about two generations ago a farmer of Melga found an image of the Virgen Mary engraved upon a stone. A chapel was subsequently built in the Saint's honor, and the imaged stone was placed there in an urn. In past years the Virgen was widely worshiped in the region and was believed to exert miraculous powers over the faithful who came to visit her chapel. She is also widely feared for her punishments when those who have made promises to her fail to keep them. The annual celebrations at Melga feature the highest quality folkloric dancing, and thousands of visitors come to Melga each year to watch the performance of dance groups from Melga and neighboring communities.

Organization of the fiesta follows a pattern quite similar to that described for Señor de Romasa in Huayculí. Young people make multi-year commitments to dance groups, there is a collection of funds from local residents, special sponsors and stewards are named to finance the costs of dancers and musicians, and there are processions conducted with the statue of the Saint. Also like in Huayculí, the celebrations begin with a luminaria or fireworks display on the eve of the Saint's day, followed by three days of dancing and processions. Similarly, the cost of the celebration is enormous for families appointed to stewardship posts. However, it is of passing interest to note that some Melga families also have land in the Chapare region, where they grow very lucrative harvests of coca. Thus, a considerable part of the profits from this increasingly controlled or outlawed crop finds its way into conspicuous and prestigious expenditures honoring the Melga Virgen.

In this narrative we present the text of an interview by Marina Ortuño with one of the young women who "danced for the Virgen" in 1981.

MARINA: Aquilina, what did you think of the fiesta seeing as how you danced in it? Did you enjoy yourself? How are you feeling?

AQUILINA: Look, Miss, I danced for three days and I hardly saw the fiesta at all. I did nothing but dance from 8 O'clock in the morning, following almuerzo at my home, until midnight or one in the morning.

We danced practically without eating or drinking all day long, and we got terribly exhausted. But now (the interview took place on October 20th) my feet are fine and they don't hurt. It's always like that when one dances for the Virgen. We don't tire, we can go all day and all night, but when we dance at any other party the following day we can hardly walk our feet hurt so much; we even get blisters. But not with Her. The little Virgen is miraculous. The devils may be fainting, but we go on and do not feel hunger or thirst. They provided our group with two barrels of chicha too, and few of us drunk. The mothers of a few dancers brought them chicha for a quick drink, but most of us neither drank nor ate. Finally last night we rested, and we even got drunk, and today we will conduct the cacharpaya (visits to sponsors and stewards), and we will sign our commitments again for next year.

MARINA: What is this about the commitments? Can you explain how they work, please?

AQUILINA: Each one of us voluntarily promises the Virgen we will dance at her fiesta, but it has to be for at least three years. A document is drawn up. The authorities (Agrarian Syndicate and Cantonal Agent) know all about that. The commitment must be a serious one, and it can carry a fine too, because once we sign the document is taken to the Alcaldía (mayor's office) and legalized. One can't just say yes to the obligation without being really serious.

The Virgen is miraculous. Anything can happen if you fail in your promise. Macedonia made a promise to dance with the Diablada, but then at the last moment her mother said she couldn't because they didn't have the money to buy her costume and pay expenses, and that was her excuse for not dancing. Well, would you believe, a few days ago Macedonia suffered an accident and now she's in the hospital and her expenses are worse still. The Virgen is miraculous I tell you.

She almost punished me too. The first days of practice I was pretty busy and I didn't want to come. My brother criticized me for it too, and one day I just didn't come to practice. That night I went to bed and woke the next day with one arm nearly paralized. I could hardly move it. They gave me a massage, and I begged the Virgen to forgive me, and after that I came to all the other practices without fail. The Virgen knows how to punish. Another time I was dancing at the Virgen's fiesta and I asked my father to bring my young son so he could watch me dance. Well, I guess he felt lazy and so he didn't do it, and that very same day my little son fainted. With that my father got scared and brought my son straight away to the chapel to beg for forgiveness. The Virgen never lacks for punishments. Just about everybody has their own story to tell about her punishments when they fail to keep their promise.

MARINA: The band and the costumes--who pays for those?

AQUILINA: Those are paid by the padrinos (godparents, sponsors). They too make their promises to do something for the Virgen. They might offer to pay for part of the band, or all of it, or buy some of the costumes. Others might promise to provide chicha, or beer, or whatever--and straight away they are made to sign a contract so that the commitment will be honored. Each year there are lots of padrinos. Those that we think will accept we dance up to them and cover their heads with the cape of our costume, and if they let us that means they have agreed to be a sponsor, and they can't change their minds later because they are afraid of the Virgen. We usually pick the Chapareños (those with land in the Chapare). They have lots of money and they spend it too! Everyone knows how much they spend, and yet the Virgen keeps giving them much more than they give her. People from the city don't believe it when we tell our stories of the Virgen's miracles, but we've seen it with our own eyes and everybody here knows that She can be bad as well as good, and She's not to be played with.

What the padrinos pay for the bands and costumes is quite a lot. This year for the three days the band cost 25,000 pesos (US$1,000), and for only the diablada costumes they had to pay 45,000 (US$1,800), and only after bargaining and bargaining because the asking price was 48,000 pesos. These fiestas are expensive. For those in my group, the women's costumes cost 600 pesos (US$24) each, and those of the men 1,500 pesos (US$60). It's all very expensive. And after using a costume for three days, it sometimes breaks or gets dirty,so then we have to buy it. The costumes are sponsored by not just one padrino but three or four... yesterday we visited them and they have commited to next year's fiesta. Now we need to toast them and make them sign the document. That's the way it's done each year. When we dance for the Virgen we are happy all year long and we work harder. That's why most of us dance. It's mostly us young people, and also the little children....

MARINA: You've talked with a padrino. Don't they ever regret having spent so much on the fiesta, because with the money they could have bought a radio, a television, or a team of oxen?

AQUILINA: Sometimes, but those who served the Virgen you can see that they are happier. If it weren't for Her they wouldn't earn as much as they do, and they wouldn't work so hard either. We all know that the money could be used to buy this or that, but the Virgen comes first. Some promise her when they are drunk and then don't remember, but if they sign the document they are committed and they have to honor it no matter what. They are afraid of Her. If they break their promise they will be punished....

MARRIAGE

COURTSHIP RITUALS

In rural communities of the Valleys Region there are many recognized ways in which young people signal their attraction for one another. One is for the llokalla (young man) to steal the hat of the imilla (young woman) who he desires; if she runs after him trying to recover it, she thereby signals her interest in her suitor. Another ploy is for the llokalla to toss a stone at his imilla, which she must return to confirm her courtship interest. Still another traditional signal is for the young man to deliberately trip the young woman; if she falls and laughs, she is interested in a relationship with him. In recent years these traditional courtship rituals have been increasingly falling into disuse because young people now have more opportunity to meet alone at parties and dances, and they are beginning to imitate urban courtship patterns.

COHABITATION

In any event, courtship seldom leads directly to marriage. Rural people have a great respect for marriage and consider divorce to be a terrible sin. They therefore encourage cohabitation--known as sirviñacu--as a trial marriage to make sure the couple is compatible. In one form of sirviñacu, the couple live alone in their own home and register their relationship. Called tatanacu, this cohabitation can last from a few months to many years and may even become a permanent substitute for religious and civil matrimony. It often occurs in those instances where a coulple lacks access to sufficient resources to throw the kind of lavish wedding party that would bring them community prestige.

A second form of cohabitation occurs in which the young people live in the llokalla's home. There the imilla is subjected to the intense day-to-day scrutiny of her (possible) mother-in-law. The latter may assign her cooking tasks or artisan craftwork to test her dexterity; note will be taken of when she rises in the morning, and how well she performs household and field tasks, and ultimately whether or not she is capable of bearing children. In such cases the judgement of the suegra is more important than the llokalla's; if the mother-in-law finds the young woman to be unsatisfactory, the imilla is returned to her parents.

MARRIAGE PREPARATIONS

The major concern of the bride and groom to be is to have a wedding that will truly please the community. The most important focus of attention is usually not the church ceremony itself, but rather the wedding celebrations that follow--for the festivities may last 2, 3, 4 or more days with hundreds of people in attendance. However, it is noteworthy that a young couple and their respective parents do not have to shoulder the responsibility of marriage preparations alone. The financing of marriage investments tends to be shared more broadly through a network of friends and, more importantly, padrinos (godfathers) and madrinas (godmothers). Godparents may be named to pay for the wedding dress, the bride's beauty salon expenses, the church expenses (priest, flowers, and decorations), the wedding ring, the transportation of guests, the orchestra for the wedding party, and other expenses. Furthermore, a bride-to-be can usually count on 15-20 of her friends and relatives to help out with the preparation of food and beverage. The groom-to-be can count on several friends to help set up the tents, arrange furniture, and handle other logistical details. Neighboring families will lend plates, glasses, furniture, cooking utensils, and supplies. As one bride from Huayculí expressed it: "Here in the country one can not live without friends. We always need help from others, and they from us. To say no to a friend who requests a favor, well, it's like saying we don't know how to live with other people."

WEDDING DAY

The bride and groom go to town early on the day of their wedding. They are met by their two principal godparents--the padrino to dress the groom, the madrina to dress and prepare the bride. The bride wears a white dress decorated with abundant flowers and ribbons. Her hair and make-up must be perfect; for her wedding day she must be more beautiful than any time in her life.

The wedding usually begins around 11 or 12 A.M. It is a standard ceremony involving fixed prayers, an exchange of vows, the gift of the wedding ring, and the priest's pronouncement of husband and wife. The newly-weds emerge from the church through two arches of flowers decorated with paper bells. They are showered with rice (signifying enduring love), sugar (eternal honeymoon), and confetti. Everyone boards the awaiting transportation which carries them back to the community and the site of the wedding party. The site of the festivities may be the house of the newly-weds themselves (where they have cohabitated), or the home of a parent or godparent. .

WEDDING PARTY

Wedding parties are almost always held outdoors. There is usually a tent for the bride and groom, another for the orchestra, and a third for guests. The celebration begins with a wedding march. Next the bride and groom dance a waltz together. The couple then invites their principal godparents to dance. The groom now invites all guests to drink, the alcohol provided by the bride's parents. Throughout the remainder of the party the bride and groom must manage to drink with each and every one of their guests. Following the initial toast, the guests are served a first meal--called sajra mikhuna or "meal at a bad hour, an hour of hunger"--at about 3 P.M. All flowers brought from the church are placed on a table, the signal to start the tipanacu or "fastening". This ritual consists of guests pinning money to the clothing of the bride and groom, anywhere between the waist and shoulders. Money gifts are provided by those who have not given formal wedding presents. The value of the money given is supposed to symbolize the degree of respect or level of friendship between donor and recipient. Being a public act carefully observed by all guests, it is an opportunity for some individuals to demonstrate their prestige and above-average affluence in the community.

The wedding party continues with dancing and drinking until late hours of the evening or "until the orchestra tires". The dancing will be interrupted by a second meal served about two hours after the first. There is a wedding custom related to the dance known as the cuenca, which is performed in two stages interrupted by a brief rest; at that moment the dancers lock right arms and empty their vessels of chicha by drinking simultaneously. Known as aros, this is the preferred way for bride and groom to dance with and toast each of their guests.

Guests who are in a hurry to drink, or wish to obtain a pitcher of chicha to drink with a group of guests, must purchase their beverage. Cigarrettes, coca, and other items are also available for sale. Furthermore, guests of lower social status are required to drink from ceramic vessels and gourds; those of higher status are served in glasses. Such apparent compromises with the ideal wedding atmosphere of ample hospitality are accepted by guests as perfectly normal.

The wedding party continues all afternoon and evening of the following day or two. The first day may be given by a godparent, the second by a parent, the third by the bride and groom, etcetera. The only major change in procedure is that the white wedding dress is only worn by the bride on the first day. On each following day of partying she is expected to show off a beautiful new dress. At the end of each day the money collected during tipanacu is counted by the bride's godmother. It is customary for the godmother to add a sum of her own so that the total amount will be rounded up to an easily remembered figure--for example, from 6,520 pesos to 7,000.

WEDDING COSTS: INTERVIEW WITH A NEW BRIDE

Angel Alba and Juana Alvarez of Huayculí were married in May 1981. On May 23 Juana was interviewed by Marina Ortuño on the subject of her wedding.

MARINA: Juanita, since I couldn't attend your wedding, could you tell me about it, and how much it cost?

JUANITA: Everything went very well, but it cost us so much that we could never do anything like that again. Happily its over. A lot of people came. From Tarata we brought four truckloads, but I was told that all in all there were a total of nine trucks. Hundreds of people were there--young and old. We had a five piece orchestra. We served food for the first two days, and the third day we only gave chicha. What my madrina was supposed to have given at her house we held right here at ours. The chicha was completely gone. We had made seven puñus (huge earthern cistern) of two barrels each (which amounts to some 2,800--3,000 liters) and it was all consumed. We used three cargas of potatoes (600 pounds), two arrobas (50 pounds) of rice, 1.5 arrobas of noodles (37.5 pounds), ten pounts of lard, two large sheep--each one worth 600 (US$24)--and 25 chickens, and every bit of it was eaten. In all, considering the clothes and the shoes I bought, we spent about 30,000 pesos (US$1,200). We wouldn't even be able to earn that much in an entire year of work, but now we feel better. Although we spent a lot, we had been living together for several years without a church marriage, and that is a sin.

MARINA: Was your wedding dress white, Juanita, or another color?

JUANITA: Everything was white, the veil too. My madrina bought it for me for 1,800 pesos (US$72).

MARINA: Don't you regret having spent so much money, knowing you can never get it back?

JUANITA: It makes me sad, sure. But I had no choice. It was my obligation. If I hadn't done it I would have been criticized by the people. Everything they criticize here. But since we don't have any children it wasn't so hard. When one has children, that's when it must really hurt to spend so much money...because they will be left in need.

MARINA: Surely you must have received some presents. How many? And from the tipanacu didn't you get back at least half of what you spent?

JUANITA: There were 23 presents in all, but none of great value--plates, glasses, a blouse, a shirt, that's about all. From the tipanacu I didn't get back even half, but there was still something. Mostly people pinned me with 50 and 100 peso bills. That is the custom, to give money if one hasn't given a wedding gift.

DEATH AND BURIAL PRACTICES

A death is a community event. All resident families are expected to help the widow or survivors in some small way, or at the very least to pay their respects by accompanying the corpse for a few hours. To not appear at the wake is to say the deceased was not liked and not worthy of respect. Visitors to the grieving household are expected to bring gifts of food, alcoholic beverages, money, or other contributions to defray burial expenses. For its part, the deceased's household is expected to prepare the most elegant funeral arrangements it can possibly afford. It is considered unimportant that a family deeply indebt itself to pay for an expensive wake and burial, for to do so is regarded as both an obligation and true homage to the memory of the dead. The family that spares no expense to bury its dead elegantly gains considerable prestige.

LAST RITES

Upon learning that someone is dying, friends and neighbors are expected to come immediately to the bedside to accompany the dying individual and his or her family. The visitors bring chicha. They form a circle around the bedside and cry for its agonizing occupant. The visitors drink and cry until life expires.

The corpse is then bathed completely in cold water and laundry soap. This task is performed by someone who is not a relative. Finally, the body is placed on a cot or table, dressed in its best clothes, and covered with a sabana santa, a white sheet with a black cross. At the head of the deceased an altar is prepared with a crucifix, palm branches, and candles. The use of a coffin is optional.

THE WAKE

Each visitor to the wake is expected to bring a gift. This may consist of candles, cooked food, a chicken, produce such as potatoes, rice, or vegetables, some alcoholic beverage, or money. Visitors attempt to pass the entire evening without sleeping. To keep from getting sleepy, guests often play cards for cigarettes or cash, with the winnings donated to the bereaved family. The next morning all guests are invited to a sumptuous meal—the lagua huchu, a spicy porridge with meat (chicken or lamb). No food should be left uneaten. The meal is accompanied by generous amounts of chicha.

BURIAL

Several men go to the community cementery to dig the grave. The family of the deceased sends them food and chicha during their labors. The grave itself is normally dug to a depth of two meters. It is constructed by first digging a trench, and then carving a horizontal cave big enough for the body or coffin. When the corpse is carried in procession to the gravesite the accompanying mourners are expected to cry out loud, for the audible lament is regarded as the highest gesture of farewell. The holy sheet remains around the corpse. If the deceased is a child, small gourds are placed in its hands so that it can water the plants of Heaven. The belief is that babies always go directly to heaven. Once the corpse has been placed inside the niche, the opening is sealed with adobe bricks sealed with a mud plaster. The trench is filled and the gravesite decorated with flowers. All mourners pray, share cigarettes, and chew coca.

POST-BURIAL

The day following the burial it is customary for friends and neighbors to meet at the home of the deceased to conduct the thajsay or washing. Clothing, blankets, and hides used by the deceased are taken to the river, scrubbed clean, and sun-dried. Preferably, the washing is done by non-relatives of the deceased. The activity becomes very much a social affair accompanied by abundant chicha, lagua huchu, chewing coca, smoking, and games of chance played by the men. At day's end the dried clothes are brought back and formally returned to the widow or other surviving household head.

Following a death, it is customary to keep candles burning in the home of the deceased for nine consecutive days. This practice is based on the belief that the spirit is still wandering around and continues to visit its former residence.

MISA CHICA

On the ninth day following death a mass is said for the deceased. The event is known as the misa chica (small mass) or misa de alma (mass of the soul). The mass is held at the church of the nearest town. Invitations to the general public are frequently broadcast on a local radio station, and guests are invited to the home of the deceased--following the mass--to eat and drink in memory of the departed. The party following the misa chica is usually a major social event. A truck may be hired to bring the guests from the church. They are attended with generous amounts of chicha and a sumptuous banquet of special dishes. The extravagance far exceeds the attentions conducted at the wake, for by the ninth day the bereaved family has had over a

week to prepare. In 1981, the estimated average cost of the party was some 8-10,000 pesos (US$320-400), well in excess of a year's employment at minimum wage. The extravagance is justified, so goes the belief, because the deceased's spirit is still wandering about, and the soul will finally depart happy after it has seen a real celebration in its name.

In addition to the misa chica, the family of the deceased may honor his or her memory with additional masses said at three months and a year after death. The participation of friends and neighbors is greatly appreciated at these events because the more prayers the better. It is believed that spirits need prayers like the living need food.

When in mourning, rural women are expected to dress completely in black from head to toe. Many use a black shawl for 1-3 months. While dressed in black, the woman should not attend a fiesta, nor dance, nor run, nor sing, nor listen to music on the radio for at least ten days following the death.

CHILD'S FIRST HAIRCUT
(CHUJCHA RUTUY)

It is commonly believed in rural communities that a child's first hair is sacred. Thus, the child's first haircut becomes the motive for a special celebration known as chujcha rutuy to be shared with relatives and friends. In this ritual the child's locks are tied into dozens of little clumps, each fastened by a ribbon. A godparent is named for the event, and it is his or her job to cut the first lock. For this honor the godparent is expected to give the child the gift of an animal--perhaps a calf or a cow. All invited guests at the hair-cutting party are given the chance to cut one or more locks of their own. For each lock they must make a cash payment that varies in accordance with their economic means or the degree of friendship and respect that exists between them and the child's parents. In some cases it is also customary to compliment the godparent with one or more tesigos or witnesses. Each witness will then give a gift of minor livestock, for example a chicken or lamb.

Contrary to what the giving of these gifts might suggest, the celebration of chujcha rutuy sometimes involves the sponsoring family in a heavier outlay of resources than those it takes in as gifts. First of all, the family must prepare a large batch of chicha--which implies a resource expenditure valued at 1-2,000 pesos (US$40-80), even though actual cash outlays may not exceed 300 pesos (US$12). Secondly, the family must provide a special meal for all guests. For example, in September 1980 Martina Macías of Puca Puca prepared a chujcha rutuy feast that required one sheep, two chickens, 75 pounds of potatoes, and sundry additional ingredients amounting to a total value of 855 pesos (US$34.20). However, cash gifts from guests amounted to only 400 pesos (US$16).

Still, just about all families conduct this party for each of their children. There is no specific time at which the party must be held. The age of the child is quite variable. Most families prefer to hold the party following the harvest, when they enjoy their greatest abundance and therefore can use home-grown produce for most of the ingredients required to host the event.

LIBATION TO THE EARTH MOTHER (CH'ALLA A LA PACHAMAMA)

One of the most authentic expressions of Bolivian folklore is the burnt offering to the Pachamama. The ritual is practiced nearly universally during Carnival Week, when rural people give thanks for the approach of harvest abundance. But such offerings are also common on most other holidays---Easter, Santa Vera Cruz (May 3), San Isidro's Day (May 15), St. John's Day (June 24), Farmer's Day (August 2), All Saint's Day (November 1), Christmas, and others. For many farmers the ritual is also a prerequisite before planting a major crop, or before harvesting it. The following description is based on ceremonies observed in Melga.

THE MESA DULCE AND OTHER MATERIALS

The basic materials for conducting the offering are contained in a package known as the mesa dulce (sweet table). Its ingredients include the following: (1) a bed of crumbled k'oa, an aromatic plant that gives its name to the ceremony itself, which is known as the k'oada; (2) the misterio (mystery), a rectangular wafer impressed with the image of a toad, which symbolizes the Earth Mother; (3) the estrella, another wafer in the form of a star but superimposed with a cross, suggesting the integration of Catholic and pagan beliefs; (4) a small bottle made of molded sugar, symbolizing the beverages used to toast the Diety; (5) candies made of sugar--known generally as colación--which are colored pink or white; (6) llama unta or llama grease, (7) mistura (confetti), (8) copal, (9) incense, (10) retama flowers, and (11) different colored yarns, which lie in a circle and inclose the other ingredients. The mesa dulce is purchased in the market. Its ingredients will vary slightly from one holiday to the next.

Aside from the mesa dulce, a ch'alla to the Earth Mother requires a considerable assortment of alcoholic beverages. Chicha is the most abundantly-used drink. In addition other common drinks include sweet wine, anise, grape brandy, and cane alcohol. Some families in Melga are beginning to also use beer, preferably the malt variety.

To complete the materials for the ceremony, one needs more candy (to be thrown on participants during the central part of the ritual), confetti, and streamers.

THE RITUAL

The participants in the ceremony assemble in the field where it is to take place. The owner of the plot lights a fire to burn the offering. It is at this moment that the participants implore the Earth Mother for her protection, asking for an abundant harvest or whatever. The mesa dulce is then placed into the fire. As it bursts into flame it is sometimes customary (at Carnival) to set off a rocket which explodes in the air; this act symbolizes that it is time for the Earth to awake from its sleep. As the offering continues to burn, the different participants toast the Diety with the sundry alcoholic beverages they have brought with them. Upon receiving a glass or cup of liquid, the offerer sinks to his knees or, while standing, removes his hat. He spills the first few drops into the burning fire, then utters his supplication. For example:

> "Virgen Pachamama, receive this offering so that your production will be bountiful, and that all the potatoes will be of highest quality."

> "Virgen Pachamama, take your drink, produce a good potato crop, one that will last all year."

Following the burnt offering, the participants decorate the plot with streamers and confetti. At this moment the owner of the field scatters the candy over the others, which leads to a mad scramble.

The ch'alla ceremony usually concludes with the chewing of coca or the smoking of cigarettes. The participants discuss crop prospects, the weather, or other subjects.

GLOSSARY

A

ABONO: Animal fertilizer
ABONO FOLIAR: Leaf fertilizer
ACHAQUE: Ailment (rash), believed to be caused by contact with anthill
ADOBERA: Wooden mold for making adobe bricks
AFINAR: To finish, scrape, put final touches on pottery
AGUAYO: Mantle, used by women to carry babies, cargo
AHOGADO: "Drowned", term given to a spicy vegetable sauce
AJI DE CORDERO: Spicy, boiled lamb
AKHA NAHUI: "Eye of the chicha", the skim of a vessel of chicha
ALCALDIA: Mayor's office
ALASITAS: An artisan holiday of Bolivia, celebrated for 2-3 weeks beginning January 24
ALCABALA: A municipal market tax charged retail vendors for the space they occupy at market; same as sentaje
ALGARROBO: Carob tree
ALMA CARPACHA: Farewell to the spirit, November 2nd.
ALTARERA: Woman who decorates altar for community saint's day celebration
ALTEÑO: One who comes from the highlands
ALMUERZO: Lunch, a hot meal served before workers leave for fields circa 8-10 A.M.
AMARRO: Bound package of coca leaves; bound clump of onions
AMANCE DE NOVILLOS: Training of young oxen
AMBROSIA: Drink made of warm milk and grape brandy
AMOR SECO: An herb tea
ANIMO: Soul, spirit
ANTAWARA: Sunset of red-orange clouds, an indicator of frost
ANIZADO: Alcoholic beverage drunk in ritual libations
APAGPAY: Last hilling, same as kunkada
APEADERO: Pastureland where mule teams were rested between trips
APILONANDO: Loading raw ceramics into a pottery oven for baking
API: A thick, sweet beverage made from corn; a syrup made from chicha sediments
APORQUE: Hilling
ARADO: Wooden plow

ARCILLA: Clay for pottery making
ARIPAS: Soft, corn tortillas made from early corn or choclo
AROMA: Orange
AROS: Drinking chicha with linked arms while dancing cuenca
ARMA: Stem of wooden plow, connects yoke to plowshoe
ARRIERO: Driver of mules
ARRIENDO: Rent; leasing of an onion field by buyer, who purchases the entire crop
ARRIMANTE: Outsider, one not born in community where he resides
ARROBA: Unit of measure, equal to 25 pounds
ARROPE: A sweet distilled sediment from the process of making chicha; same as miski keta
ARROZ GRANEADO: Fried rice
AVENA: Oats
AVENA EN BERSA: Green oats, used for livestock fodder
AVENA CON LECHE: Oatmeal with milk
AYLINQUEAR: Task of cutting potato stalks prior to harvest; same as corte de aylinco
AYNILLAS: Gifts which are, in effect, long-term loans
AYNI: Exchange labor
AYSA YUGO: A narrow, lighter yoke, used for furrowing and hilling tasks
AYSAÑA: Hilling of corn, using an ox-team
AZADON: Hoe

B

BADANA: Goat hide
BARBECHO: First tillage
BARBECHO DE LLUVIAS: "Rain tillage", conducted during first days of rainy season
BATEA: Shallow wooden trough used for washing, threshing, mixing dough, etc.; also, holes dug between rows of a crop to slow down and detain irrigation water
BARRENDERA: One who sweeps threshing floor
BATAN: Grinding stone; same as marán
BATERIA: Enameling fixative, made from powdered lead from batteries, used in making pottery
BELLON: Wool of a single sheep
BIDON: Plastic tank of 10 liter capacity
BOLETA: Slip of paper, ticket, certification of user water turn in irrigation system
BOLETAJE: Market tax on livestock sales
BOLLITOS: Four-ounce units of cheese
BOLLOS: One-half loaf of cheese
BOQUETE: Underground wheat storage chamber, built in the field
BUÑUELO: Corn fritter; popular at Christmas, served with honey

C

CABALLETE: One horse or burro-load of firewood, about 100 pounds
CACHARPAYA: Day for visiting stewards or sponsors of patron saint's day celebration
CABRILLA: Cluster of stars near the Southern Cross
CAJON: Box; raised seedbed used in planting onions; pit where clay is mixed for making pottery
CAITO: Two-strand wool yarn
CALABAZA: Squash
CALCHA: Vertical stack of drying corn; same as kalcha
CALDU ÑAHUIS: Glassy, teary eyes, a symptom of fright
CAMANCHACA: Onion stems dry as if burnt, caused by excess humidity
CAMELON: Furrow for transplanting onions
CANELA: Cinnamon tea
CANTARO: Clay pot or pitcher
CAPORALES: Traditional Bolivian folkloric dance
CARGA: A unit of weight equal to contents of one cargo bag; varies from 150 to 225 pounds from one community to another
CAROMA: Thick cargo mat for a beast of burden
CARGADO: A home-made cold remedy made from cinnamon tea, lemon, brandy, and Alka Seltzer
CATAPLASMA: Poultice
CASERITA: Housewife
CAYANA: Cleared space for gathering harvested produce; same as kayana
CEBADO: Fattened pig
CEDAZO: Seive for screening or sifting flour
CENA: Last meal of the day, supper
CHAKO: Masticated flour or muco after it has been sun-dried
COMPAÑIA: Joint cultivation or harvest-share arrangement
COLACION: Sugar candies, used in burnt offerings and sweetening chicha
COMERCIANTE: Medium-sized intermediaries
COMUNERO: Community resident
COCA KJAWIRI: One who reads coca leaves, a seer
CONEJO: guinea pig; rabbit
CONEJADA: Rabbit hunt
CONSERVA: Sweet jam or sauce
CONVIDO: Offering to the spirits
CORREDOR: Porch, roofed open-air work area
CORREGEDOR: Cantonal agent
CORTE: To cut or harvest a crop with a sickle
CORTE DE AYLINCO: Pre-harvest cutting of potato stalks
CORPAICHA: Spirit food, offering
COSTAL: Cargo sack
CRIOLO: Unimproved local breed of cattle
CRUCEÑO: A hardwood, known for its strong flame
CRIA: Offspring of livestock

C (Continued)

CRIOLINA: A liquid disinfectant used in treating livestock
CUARTEL: Sub-section of a field, separated from rest by a single row of a different crop
CUAJADA: Home-made cheese made from milk curd
CUENCA: Folkloric dance of Bolivia and Chile
CUIDADOR: Watchman
CULTIVO DE RELLENO: A filler crop, one which is planted in empty spaces and boundaries of a field planted to a major crop
CULLAGUADA: Traditional Bolivian folkloric dance
CURANDERA: Traditional healer
CUTY: "Come", "Return", the cry of the shepherdess to her flock
CUTY WALLPA: Chicken with an abnormal feather arrangement, used by traditional healers
CUY: Guinea pig

CH

CHACRA: Cultivated field, farm
CHAIHUINA: Metal-tipped wooden stirring pole used in making chicha
CHAJLLA: Stick-matting made of a bamboo-like reed, used in roofing
CH'AKAS: Black ants
CHAKATIA: A fuelwood; a bush eaten as fodder by burros
CHALA: Corn stalks, the crop residue, used for cattle fodder
CH'ALA MANKA: Unit of measure, equal to 1/2 viche (metric weight equivalent varies by crop)
CH'ALLU: Black worm that attacks potatoes
CH'ALLA: Libation, the ritual of blessing or celebrating one's assets
CHAKE: Dish of boiled wheat, served as a substitute for rice or potatoes
CH'ALLA DE LAGUNA: Libation to ponds, a ritual to replenish water level
CHANCACA: Unrefined sugar, hardened into blocks or loafs
CHAPARAS: The very largest potatoes
CHAPARENO: One with a farm in the Chapare region; a wealthy person
CHARANGO: Traditional string instrument of Bolivia, like a mandolin
CHAQUI: Thirst
CHAQUI LACERO: Foot rope used for training new oxen in a plow team
CHARQUI, CHARQUE: Sun-dried meat
CHARQUE SANCOCHADO: Sun-dried meat that has been parboiled
CHAUPI MISKHA: Middle irrigated crop season (June to January)
CHAUPIDA: Second hilling
CHAJMEO: Second harvest, second search or digging, in harvesting peanuts
CHICHA: Corn beer, fermented beverage made from cornmeal
CHICHARRON: Pork fries, rind
CHICOTE: Whip
CH'IA: Trichinosis in pigs
CHIHUACO: A bird whose cry is considered an indicator of rain

CHIJCHIPEAR: Task of completing plowed furrows by hand at field edges
CHILI: Smallest size potatoes
CHILLKIPIADA: Clearing rubbish, crop residues from field; desbrozada
CHICHAKA HUARI: Black ant which attacks wheat sprouts
CHIMPUS: Colored marks on cargo sacks indicating half and full loads
CHINOLI: A variety of wheat
CHIQUIRA: Separating calf from its mother during evening so that cow's milk can accumulate for milking the next morning
CHIQUERO: Hut where nursing offspring are kept when cow's milk is to be accumulated for nursing
CHIPAS: Ropes made from cowhide
CHOCLO: Tender corn, harvested before kernals harden
CHOCLO HUAYKU: Boiled corn on the cob
CHORIZO: Sausage
CHUJCHU: An ailment with malaria-like symptoms that affects cattle
CH'ULLA: A half cargo sack, equivalent to about 100 pounds
CHUJCHUQUERO: A laborer who uses a digging-hoe or chujchuka
CHUJCHUKA: Traditional digging-hoe
CHUMPI: A long, narrow strip of cloth used for swaddling babies
CHUÑO: Dehydrated potatoes, made by successive freezing and squeezing of liquids
CHUÑO PHUTI: Chuño served with an egg and peanut sauce
CHURUS: Snails
CHUSEKA: A bird whose nocturnal cry is believed to announce the death of a child
CHUYANCHAR: Cleaning and winnowing grain with wooden shovels; same as paleado

D

DAGA: Layer of bricks in the storing of a ceramic oven for baking
DAÑO: Damage to crops caused by unsupervised grazing livestock
DEFENSA: Brace for a potters wheel
DESAYUNO: Breakfast, first meal of the day
DESBROZADA: Clearing surface of field of crop residues and rubbish
DESCANSO: Rest, fallow period of land
DESHOJE: Husking ears of corn; same as t'impinada
DESPENSA: Pantry or room where food is stored
DIABLADA: Traditional Bolivian folkloric dance
DITHANE: An insecticide used on onions
DOBLE: Beer glass
DOS AGUAS: Roof slanting in two directions

E

ECHADA: One trip across the field (or length of furrow) for planting or sowing
EKEKO: God of good fortune, featured in Alasitas celebration
EMBARRADO: When germinating seeds are trapped below soil surface due to hardening of soil crust following a heavy rain
EMPANADA: A meat pastry
EMPANTO: A pre-planting irrigation of a field
EN PIE: On foot, standing; to sell an animal live
ENTIERRO CON TRES SURCOS: Three furrow burial, with one furrow plowed on each side of the seeded furrow
ESCARIOTES: Squash
ESTANCIAS: Highland communities
ESTRADO: Bed built on top of a storage bin or pirhua made of adobles
ESTRELLA: A wafer shaped like a star, a component of a burnt offering
ESTRELLANO: A variety of wheat
ERA: Threshing floor

F

FANEGA: Unit of measurement equal to about 8 arrobas or 300-350 pounds, depending on the crop
FERIA: Market
FICHUS: Clumps of dried manure removed from wool with fingernails during carding
FUMIANA: Shuttle, used in a traditional handloom

G

GABO: A variety of wheat
GALETA: Free drink of chicha, offered to first client of the day
GALERIA FILTRANTE: Micro-irrigation structure for storing limited supplies of water running in a streambed
GANANDO YUNTAS: Practice of offering human labor services to be exchanged with days of oxen at a future date
GARRAPATA: Tick
GARROTE: Stick or club used for threshing grain
GAVILLAS: Windrows of cut grain stalks
GRAMEADO: Pre-planting weeding
GRANOS: Grain
GREDA: Chalk, used in making clay for pottery; also called ll'inki
GUANERO: Worker who spreads animal manure at planting
GUSANERA: Worm infestation in calves
GUSANO PLANCO: White worm

H

HABAS: Broadbeans
HACHEADO: Hand hilling
HIEREA AMARILLA: A medicinal tea
HOLANDESA: An improved breed variety of cattle, a milk breed
HOZ: Sickle
HORNADA: Ovenful of pottery
HORNILLA: Burner of a stove
HUACA KALLU: Digging hoe, "ox tongue", same as chujchuka
HUANU: New moon
HUAYKU: Boiled
HUASI PUNKA SARITA: Corn grown at one's doorstep, in home garden
HUEROS: Eggs that fail to hatch; same as lok'os
HUAHUA: Baby
HUICHADA: Tossing pregnant mother in a blanket to align fetus; same as manteada
HUIÑAPO: Fermented cornmeal used for making chicha; same as muco
HUIRA KHOA: Aromatic plant soaked in llama grease, used in burnt offerings to spirits
HURIFA: Illness in children believed to result from rxposure of infant to a corpse or rotting meat
HUIRKHIS: Large clay cistern for fermenting chicha
HUMA PAÑO: Cloth wrapped around a child's head to keep in place a poultice or anti-fever remedy
HUMINTAS: Corncakes
HUPI: Raw chicha

I

IMILLA: Young woman
IMILLA BLANCA: A variety of potato
INFUSION: A medicinal tea
ITHAS: External parasites in poultry, lice

J

JAKA LAGUA: Porridge made of fresh corn or choclo
JALLMEO: First hilling
JULLU: A worm pest
JAMAKU: Lice
JAMPIRIS: Traditional healer
JANANTAS: Diapers
JANCHI: A coarse (lowest-level) sediment remaining after the first settling of raw chicha

JARRA: Jar, pitcher
JARAPEAR: Place scarecrows in a field
JATUN TARPUY: Rainfed crop season, October-April; second season
JATUN JALMAY: Second hilling
JAVILLA: A variety of broadbean
JAYA PICHANA: A plant used for making brooms
JOLKE: Organmeat stew
JORCA: Wooden pitchfork
JORKERO: One who pitches straw at threshing
JORNAL: A single day of manual labor
JUCU: A bird with a cry that is an indicator of death
JUEZ DE AGUAS: Water judge, an authority who ajudicates water disputes
JUNTHA: Full moon

K

KACHINA: Stick wrapped with a ball of rags at one end, used for stirring toasting grain
K'ACHIDA: First hilling, about six weeks after planting
KAIMA KETA: A liquid obtained by mixing janchi and boiling water during the preparation of chicha
K'AJILANA: Stick for tamping thread tight in a handloom
KALCHA: A storage pile of drying corn; same as calcha
K'ALLIA: A plot where potatoes were planted the previous season
KALLARI: First client of the day for a store selling chicha
KALAPAQUEADO: Task of cutting adobe bricks or roof tiles from their molds
KANALLA: Ceramic oven used to toast grain
KANTIDO: Task of combining wool strands to make a thick yarn
KANURA: An ailment in tubers characterized by premature hardening
KARISIRI: Vampire, evil spirit
KARISIRISKHA: Sickness believed to be caused by Karisiri sucking grease from flank of victim
KAYANA: Potato collection floor; same as cayana
KAYANERA: A woman who helps assemble harvested produce in kayanas
K'ASPEO: Post-planting irrigation
K'ELLU: Yellow
KEPI: One armload
KETA: A fine upper layer of distilled sediment obtained in the making of chicha
KHALINCHADA: Leaving ocas in the sun to dry
KHAPACHEKAS: Retailers of traditional medicines
KHESPICHI: A ritual form of theft, permitted during Holy Week
KHOPUYO: Fiesta in honor of a naturally-grown cross, celebrated at Carnival time
KHOCHIS: Same as wallunk'a; a swing party celebrated after All Saints Day
KHULLU: Uncookable; the longer it cooks the harder it gets
KHOMER KHURU: A green worm that attacks broadbeans
KHOMIS: Calves which nurse for two years

KHOÑALERA: Congestive ailment in sheep, nostrils fill with mucus
KHURITOS: Leaf-eating larva
KHOYURA: A blight that attacks broadbeans
KHOADA: Sacrifice, burnt offering to the spirits
KIJRAR: Selecting the most tender leaves
K'ILLPIDA: Marking of livestock with ear cuttings
KJATUS: Sub-divisions of a market yard, by type of produce
KJATERAS: Market women
K'OMER UÑA: "Children of the green", offspring born during flush pasture season
KOLKE: First class potatoes
KONCHA: Clay stove, brazier, with 1-2 burners
KONCHO: Sediment remaining at the bottom of an emptied vessel of chicha; the koncho is served to pigs

L

LACAYOTE: Pumpkin
LACAYOTE WATIA: Baked pumpkin
LAGUA: Thick porridge made of grain
LAGUA HUCHU: A spicy porridge with meat prepared for special occasions
LAKATU: Earthworm
LAMA: Fine sand taken from riverbed, used at base of toasting oven when cooking grain
LARGA: Name given to reservoir water, or water brought by a long canal
LATA: Lard can, equivalent to 20 liters
LARECITOS: People from Northern Potosí Department
LARGUEROS: Horizontal roof beams
LECHON: Young goat or pig, any suckling animal sold for its meat
LEJIA: Lye, mixture of boiled water and ashes
LISO: Loop of thread which separates strands of yarn, by separate colors, in a handloom
LEVANTAMIENTO: First tillaging, followed by volteo
LEÑA: Firewood
L'OKOS: Eggs that fail to hatch; same as hueros
LOSA or LOZA: Ceramics
LUCIERNAGA: Lightning bug
LUMINARIA: Fireworks display

LL

LLAMADA: Calling one's spirit to rejoin the body
LLAMERADA: Traditional Bolivian folkloric dance
LLAVIJO: Wooden linchpin holding plowstem in place just below the yoke
LLACHUA: Spicy sauce made of ground tomatoes and hot peppers
LLIMPHI: Chalk used for making clay used in pottery; same as greda
LLUCTA: An alkaloid product made from cactus ashes which is used when chewing coca leaves to release narcotic effect
LLULLU: "Young", applied to mud that has not been well cured
LLOKALLA: Young man

M

MACH'A KHURU: A worm that perforates and dessicates potato stalks
MAGUEY: Cactus
MADEJA: Skein of wool yarn
MAIZ AMARILLO: A variety of corn
MAIZ EN MARLO: Unshelled corn
MANCHARISKHA: Traditional ailment of "fright"
MANTEADA: Tossing a pregnant woman in the air using a blanket, intended to align fetus for birth
MANZANILLA: Chamomile tea
MAÑAZO: Livestock intermediary
MARA: Lodging of corn; also, name of skin rash caused by walking near a haunted place
MARTES DE CHALLA: Libations Tuesday, day for blessing one's assets during Carnival Week
MAS CHICA: Small, applied to seed which matures faster
MATE DE COCA: Medicinal tea made from coca leaves, aids digestion
MARAN: Grinding stone; same as batán
MATA: Sore on a cargo animal
MATANZA: Slaughter cattle, draft animals over 6-8 years of age that have completed useful life cycle
MEJICO: An improved wheat variety
MELGA: Group of 4-6 furrows, a sub-section of a field
MERIENDA: Third meal of the day, eaten at mid-day
MESA: Banquet or meal for spirits
MESA DULCE: Sweet meal for Earth Mother, celebrating life, productivity
MESA NEGRA: Black meal for spirits, celebrating death
MISKHA CARNAVAL: "Early Carnival" or first carnival, the days following All Souls Day
MISKHA GRANDE: Early, first, irrigated planting season, April to August
MINGA or MINKA: A workday to which people volunteer their time
MISKI KETA: Sweet syrup made from sediment of chicha

MISA CHICA: Mass to honor deceased nine days after death
MISTERIO: Wafer in different shapes, a component of burn offering or mesa dulce
MISTURA: Confetti
MITA: Irrigation water turn
MILLU: Rocksalt, used to rub body to cure ailments
MINI: Shuttle used in handloom; same as fumiana
MOCHO: A variety of wheat
MOJINETE: Crossbeams of a roof
MONTE: Grazing lands, usually mountainous
MORCILLA: Blood sausage
MORCK'O: Stone roller used to ground materials for painting pottery
MOTE: Boiled grains of corn
MOQUILLO: Congestive ailment in chickens
MUJERO: A man who does planting
MUKO: Masticated cornmeal, used in making starter dough for chicha
MUKUÑA: Task of masticating cornmeal or muko
MUQUEADO: Same as mukuña
MUÑA: A bush with white flowers used as an indicator of harvest prospects
MURMU: Medium sized potatoes
MUY MUY: A disease of sheep in which brain becomes infested with worms
MUYURIS: Circular plate of woven straw hung from ceiling, used to store food

N

NAVIDAD UÑA: Offspring born at Christmas time or at start of flush pasture season
NEGRILLO: Black paint used in decorating pottery
NOVILLO: Young steer
NOVILLO AREADO: Young steer driven to market on foot

Ñ

ÑETERA: A wild vine with seeds which, when ground and mixed with water, produce a lather for shampooing hair

O

OLALA: A cactus
OLLAS: Cooking pots
ORILLADA: Task of plowing field boundaries
OVILLO: Ball of yarn

P

PACHAMAMA: Earth Mother
PACHAMAMASKA: Illness caused by unpaid death to the Earth Mother
PAGA: In-kind payment for labor, harvest share
PAICO: Medicinal tea made from cactus
PAILA: Large frying dish
PAJA BRAVA: Straw growing wild in Altiplano, used by potters for stuffing cargo sacks to protect merchandise during transit
PALADOR: A shoveler, one who harvests peanuts
PALEADO: Cleaning, winnowing grain with wooden shovels
PALETA: Wooden stick for stirring
PANALAS: Sugar candies used in ritual offerings; used to sweeten chicha
PARTERA: Traditional midwife, one who attends parto (birth)
PASANTE: One who stewards or sponsors a celebration
PASADA: A "pass", a series of trips around the threshing floor in the same direction
PASTORA: Shepherdess
PASMO: Vaginal infection
PASPA: A medicinal herb tea
PEGO DE COCA: "Hit" of coca
PEJUGAL: A plot of land assigned to hacienda resident laborers in pre-Agrarian Reform Bolivia
PELEA DE MANANTIALES: A ritual for attracting rain by bringing water from one spring to another
PENDON: Flag flown from a doorway or rooftop to announce the sale of chicha
PEROL: A frying dish
PESTE: Plague that kills chickens
PEJTU: Stew
PEJTU DE VICERAS: Organmeat stew
PERAL: Axle of potter's wheel
PHATAR: To crack open, applied to broadbeans dropped in cold water after baking
PHATA MANKA: Unit of measurement equal to 1/2 viche
PHESQUEADA: Bird scaring, usually done by children with slingshots
PHINA: A single collection pile of produce from a harvested field
PHISKURA: Dropping a sickness far from the farmhouse; also, a massage
PHIRURU: Dish-like base of a spinning tool, for keeping yarn in place
PHUSKA: Wooden hand-spindle used for spinning yarn; same as rueca
PHUTI DE CHUÑO: Chuño served with a sauce of cheese, egg, and peanuts
PICHA: Clump of stiff weeds, used on a plowhare to cut a wider furrow
PICHON: Young pigeon
PICOTA: Pick
PIEDRAS DESTARADAS: Stones of various predetermined weights, used in a hand scale
PINCEL: Horse-hair brush for painting ceramics
PIÑA: Cone of wet clay, just before it is placed on potters wheel to be modeled

PILON: Pile of fodder stored in the branches of a tree
PIQUERIAS: Individual small farm properties
PIRCADO: Pointed end walls of a dwelling
PIRHUA: Storage bin made of adobe bricks, sometimes used as the base for a cot or bed
PISADERA: Platform or embankment behind pottery oven to facilitate loading from above
PITO: Toasted grain, ground and served with milk
PITUCA: A unit of measurement in marketing onions equal to 100 pounds
PLAYA DE GANADO: A market yard where cattle are bought and sold
PLOMO: Weight, counter-weight used in a handloom for keeping threads taut
PLAZA: One-half of a woven blanket, equal to one loom width
POLVILLO: An infection which attacks grain crops
POLLERA: Lower disk of potter's wheel; the drivewheel; also, a woman's hoop-shaped dress
POTRERO: Pasture; crop lot where animals are pastured following the harvest, where they eat crop residues
POYO: A bed built of adobe bricks; often empty on the inside to double as a storage bin for produce
PUCARA: Fiesta in honor of a person who suffered an accidental death
PUÑUS: Cistern of chicha with 400-500 liter capacity
PUPA: An ailment in potatoes in which all growth concentrates in one stem while all others atrophy
PUJANTE: "Pushing medicine", purgative, used to facilitate childbirth

Q

QINI: Wild bush eaten by burros
QUEMADO: A burning or single firing of a pottery ovenload
QUEP'IS: One backload of fuelwood, about 100 pounds
QUIMIQUERO: Spreader of chemical fertilizer during planting
QUINTAL: Unit of measurement equal to 100 pounds or four <u>arrobas</u>

R

RANK'ERA: Small wholesale intermediary at marketplace
RAPIDITO: Small pick-up truck which carries cargo and passengers
RAYADA: Scratch or furrow
RAYO RUMI: A rock material used for medicinal purposes
REFUCILIO: Clear air lightning
REJA: Plowshare, made from truck leafspring; also, refers to a single tillage
RENEGUERA: Ailment in pigs; same as <u>Suchera</u>
RETAMA: Flower used in burnt offerings honoring the spirits

RODILLO: A wooden roller used to level the soil surface after land preparation or planting
ROMERILLO: A ground condiment used in a paste which, when applied to the nipples, helps to wean a child from breast feeding
ROPA CHICA: Clothing that needs to be washed almost on a daily basis
ROPA GRANDE: Clothing that are washed weekly or at even larger intervals
ROSARIO: A leaf worm that attacks potato plants
ROSCA: Raw wool, prior to spinning
ROSQUILLA: A breadring made from cornmeal
RUECA: Hand-spindle for spinning yarn
RUNACHAR: To beautify produce by washing it in a ditch
RUTUY: Shearing of sheep

S

SABANA SANTA: Holy sheet, decorated with a black cross, for burying dead
SAHUMEAR: To burn incense, to create a pungent smoke for curing a congestive ailment
SAICE: Toasted muco dough, used in making chicha
SAJRA MIKHUNA: "Meal at a bad hour", meal at the hour of hunger
SAJRA WAIRA: "Bad wind", a disease that decimates ducks
SALA-DORMITORIO: Bedroom of the house, also serves as room for entertaining guests
SAMAY: Third meal of the day, taken at mid-day
SAMAYKUN: Breath of oxen, believed to stimulate plants to grow faster
SANCUDO: Mosquito
SANGE DE TORRO: Bull's blood, a red dye
SAN JUAN UNA: Offspring born around San Juan, after the flush pasture season
SARA QOCITU: Piglet
SARUNAS: Levers on a loom which open thread spaces to allow passage of the shuttle
SAYANKU: "Lightning sickness", illness caused by a person coming in contact with an object or place that has been struck by lightning
SENTAJE: Market tax on space occupied by a produce retailer
SEÑA: Payment of cash advance in a cattle sale--about 5-10% of final price --to close the deal
SHANKA: A meal of roast meat, with potatoes and noodles
SHUKUSKA: Delivery of a baby in the squatting position
SILVI KHURU: White and yellow worm that attacks potatoes
SIMI MUKU: Chicha prepared with muco (masticated corn meal)
SIRVIÑACU: Cohabitation
SINGANI: Grape brandy
SUCACHADA: Task of hilling peanut plants with a hoe
SUCHERA: Ailment in pigs (also called Peneguera) involving rapid weight loss and dragging of hind legs

SUERO: Whey, the liquid biproduct of cheese making
SULTANA: Ground coffee husks
SUNTHIDA: Running and leaping, part of the Potato Dance in Melga
SURAZO: Unseasonable cold winds and fogs that move in from Bolivia's eastern lowlands; also called pinganillo
SURCO: Furrow

T

TANTEC: A seed that is neither large nor small
TANTA HUAHUA: Bread babies used in mock baptisms
TAQUIPAYANAKUS: Groups of roving dancers or singers of improvised lyrics, who perform for food and beverage at parties
TARPUJADO: Replanting
TARAKACHIS: Flocks of swallows that attack corn crops
TARUGA: Deer
TASADA: Appraising or weighing
TATALA: Cross worshipped on the feast of Santa Vera Cruz (May 3)
THAJSAY: Washing the belongings of a dead person
THAMIY: Second turning over of the soil to look for more tubers during the harvesting of ocas
TATANACU: Legally registered cohabitation
TELAY: Task of stretching yarn prior to weaving
TEPES: Sod blocks
TERRENO IDEASO: Fallow land
TEJAS: Roof tiles made of clay
THAPA: Nest built of straw and refuse by sow in preparation for giving birth to her litter
THIKANCHAR: Enflower, adorn a meal with a special food
THOJTU: A potato blight caused by excess humidity
THULLMA: Piece of wool yarn used to tie pigtails together behind head
THUTA: Moth
THIMPU: Boiled lamb dish
TICA: Pressed cheese that is air dried for long-term preservation
TIENDA: Store
TIJERALES: Rafters
T'IMPINA: Wooden needle used for husking ears of corn
TINTAROKA: Curved stick for removing baked goods from outdoor oven
T'IMPIDA: Task of harvesting and husking corn
TIRADA: Unit of harvest measure for corn, equal to nine arrobas or 225 pounds
TOSTADO DE TRIGO: Toasted grain; same as pito
TORNO: Potters wheel
TRAMITE: Redtape, procedure
TRENSAS: Pigtails
TRIGO LLUCHUSKA: A dish of boiled wheat, resembling rice
TROJE: Open-air storage crib for corn

TUMBA: Banquet of favorite meals of a deceased person, arranged on a table in an altar-like fashion
TUPU: A cargo sack, similar to carga or pesada
TURRIL: A barrel or oil drum of 200 liter capacity
TUTUMA: Axis of hand-spindle or rueca; also, a gourd used as a drinking vessel

U

UCHUQUILLA: A variety of corn
ULPICA: Wild chili pepper
UMBRAL: Door or windowframe; also heavy log used in land leveling, same as rodillo
UMBRALEADA: Task of land leveling using an ox-drawn umbral
URPUS: Ritual bread baked for All Saints Day celebrations
USPA ONKOY: Ash sickness which dessicates broadbean plants

V

VALLUÑOS: Cattle intermediaries who come from central Valleys Region (Cochabamba, Punata, Cliza, Sacaba)
VELADA: To remain awake all night "accompanying" a statue or corpse at a wake; to burn one's velas or candles
VENTEO: Winnowing the grain crop after threshing
VERDOLAGA: Purslane, a wild plant cooked for stew
VICHES: Units of measure equivalent to 32-45 pounds, weight varying from one crop to another; viche itself is a ceramic vessel
VISPERA: Eve
VISPERA DEL SANTO: Eve before a saint's day
VIRQUE: Water tank, container for water storage
VOCALES: Delegates
VOLEO: Broadcasting seed
VOLTEO: Turning of the soil, the second tillaging conducted at right angle to the first tillage or levantada

W

WALLPA: Chicken
WALLUNK'A: Swing used on days following All Saints Day; also known as khochis
WIÑAPU: Masticated cornmeal used in making chicha; same as muco; also spelled huiñapu
WAÑU: New moon
WATA BARBECHO: Yearly tillaging, completed in March or April
WATA TARPUY: Yearly rainfed crop or planting, December to April

Y

YANA MAIKHA: Black earth, a type of clay
YAKU MACHU: Water lord, an authority who controls water distribution
YAPA: Surplus, extra amount added when transaction is finalized
YARWI: Thick needle used for sewing cargo sacks
YATIRIS: Traditional healer, holy man or medicine man
YAWARCHADA: Staining walls of newly-built home with lambs blood to scare away evil spirits
YUCOMA: Nuzzle for young livestock which prevents them from nursing
YUGO: Yoke
YUNTA: Team of oxen
YURAJ MAIKHA: White earth, a type of clay

Z

ZORRO: Fox; also name of drake (male duck)