Chapter 5
Trueque Chilote: Traditional Barter Networks Connect Nature and Society in Northern Patagonia

Richard A. Vercoe

> "Thus began a learning that cultivated plants are living artifacts of times past, available where archeology and written document are wanting, or making these more explicit."
> (Carl O. Sauer, Agricultural Origins and Dispersals. 1969)

Introduction

The agrarian system of Chiloé is as unique and dynamic as the archipelago's UNESCO World Heritage recognized culture. This agricultural hearth incorporates both marine and terrestrial systems in a food system that has sustained the islands' inhabitants for thousands of years, while conserving and even maintaining highly diverse ecological systems such as temperate rainforests, brackish estuaries, freshwater wetlands, deep water fjords, and endless coastlines. The result is a resilient and highly sustainable agrobiodiverse landscape that was recently designated as one of the world's first Globally Important Agricultural Heritage Sites by the United Nations' Food and Agriculture Organization (FAO 2011).

The endemic potato-wood barter system between the islands of Chiloé and the surrounding fjordland communities of Patagonia, known locally as *trueque Chilote*, has been in place for centuries.[1] Fjordland communities along the rugged mainland coast exchange wooden posts cut from native trees for the abundant potatoes grown in Chiloé. This barter system provides vital resources to isolated communities where national currency is scarce or nonexistent. The natural and cultural dynamics

[1] The English translation of "Trueque Chilote" is Chilote barter. Chilote barter will be used in the text to refer to the traditional, nonmonetary exchange of local products (specifically potatoes and wood) that is unique to the culture Chilote people of the Chiloé islands and mainland coasts of southern Chile.

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of trade based on primary food production and natural resources in these rural communities offers insights into the spatial organization and social continuity that non-monetary barter systems are uniquely able facilitate.

This chapter presents a cultural ecological analysis of Chilote barter. It describes how local agroecological systems can give rise to particular cultural practices, landscapes, and sustainable economies. Based on 2 years of field research and more than a decade of immersion in the region, this study focuses on one of the more unique and previously undocumented components of the Chiloé archipelago heritage agroecological system. I examine how the Chilote barter system is still being practiced within communities of the region, including the specific items being traded, exchange rates, and the way the trade is driven primarily by natural resource needs and sociocultural relations.

For centuries, the residents of Chile's Chiloé archipelago have maintained resilient communities and sustainable landscapes with high crop diversity, strong interdependent community networks, and unique socioecological lifeways. Chiloé is the home of several important global cultivars, most notably the potato *Solanum tuberosum tuberosum* and the strawberry *Fragaria chiloénsis* as well as the only low-elevation adapted quinoa variety *Chenopodium quinoa*. The islanders—called Chilotes—have cultivated hundreds of varieties of potato since before the arrival of the Spanish who subsequently introduced the tuber to Europe. While domestication of the potato family occurred in both the Altiplano region of Bolivia, Peru, and Ecuador and the Chiloé archipelago, it is the high latitude, low elevation, and climactic similarities of Chiloé that facilitated potato exports during the seventeenth and eighteenth centuries. Chiloé's climate and low-lying island biogeography is the southern hemisphere equivalent of the British Isles and more specifically, Ireland. This climactic connectivity accounts for the ease with which the potato became naturalized in the Irish landscape and culture as well as in many other Western European regions. In fact, recent genetic studies confirm that 90% of the genetic material in all of the world's major potato varieties originate from the lush fields along the shores of the Chiloé archipelago rather than the more emblematic terraced slopes of the high, arid Andes (Yao 2010).

Research Methods and Analysis

This study took place on both the mainland and island sides of the trade network. I initiated research visits with known wood-traders who then established and facilitated contact with island potato cultivating counterparts. Subsequent participants were obtained through discussion and interviews with community members who were familiar with the barter activity and knew other local participants on either or both the wood and potato ends of the network. I quickly found that multiple potato-producing contacts could be obtained from a single wood-trader and likewise, multiple new wood-trader interviewees were identified through contact with the potato

producers. In this regard, this study was not based on a random survey of residents within the geographic area of study or the trade network. Rather, I used a purposive sampling procedure to select islanders who were known to participate in barter. Because of the remoteness and lack of formal connectivity in this area—the fact that there were little or no formal communication and transport services—this methodological approach was more viable. Of the 18 semi-structured interviews I carried out, 10 were with mainland wood providers and 8 with island potato producers.

Interviews were conducted at the informant's residence in most cases. However, I obtained some follow-up information by participating in actual trading journeys, as well as by working in the forests and fields helping harvest wood or potatoes. The semi-structured interviews provided quantitative data regarding land ownership location and dimensions, productivity rates and regeneration rates, dates of trade voyages and quantities traded, as well as qualitative data describing social relations and barter dynamics. The quantitative information allowed me to establish an ecological baseline of land-use and practices. The interviews gave me ethnographic information to help address the cultural aspects of the nature-culture dynamic of this barter system. Qualitative data from semi-structured interviews includes seasonal patterns of production, preference and selection of specific varieties cultivated, which varieties were for domestic consumption, trading, or both. Additional data included harvest techniques, and relationship dynamics such as cooperative labor practices or selective use of animals such as oxen which were shared between multiple households.

I most often conducted the interviews at the informant's home. This practice was mutually beneficial because, given that transportation is limited or nonexistent, participants did not have to expend time or energy traveling to another location. Few families in this region have personal transportation other than by foot. Conducting interviews "on site" also allowed me to visit the participant's land from which they most often obtained their goods to trade. Since it is local custom to receive guests into one's home for conversation, participants were always amenable to these visits. Due to the Chilote's hospitable customs, interviews usually took place around a wood-burning stove with numerous rounds of máté (a green tea that is traditionally consumed during social interactions). Other family members were often present during the interviews, since it is traditional practice within the culture to live with extended family and most daily activity revolves around the homestead. Interviews intentionally occurred around the participant's main meal, lunch, when they were more likely to be home and available. This occasionally led to interviews lasting two or more hours with an entire family and a meal included. This allowed for several digressions from the interview questions, which provided interesting and valuable context beyond the formal questions.

A cultural ecological land-use analysis of the area included data obtained from the Military Geographic Institute of Chile (IGM), preclassified land-cover layers obtained in the field, and researcher generated land-cover classifications based on satellite imagery.

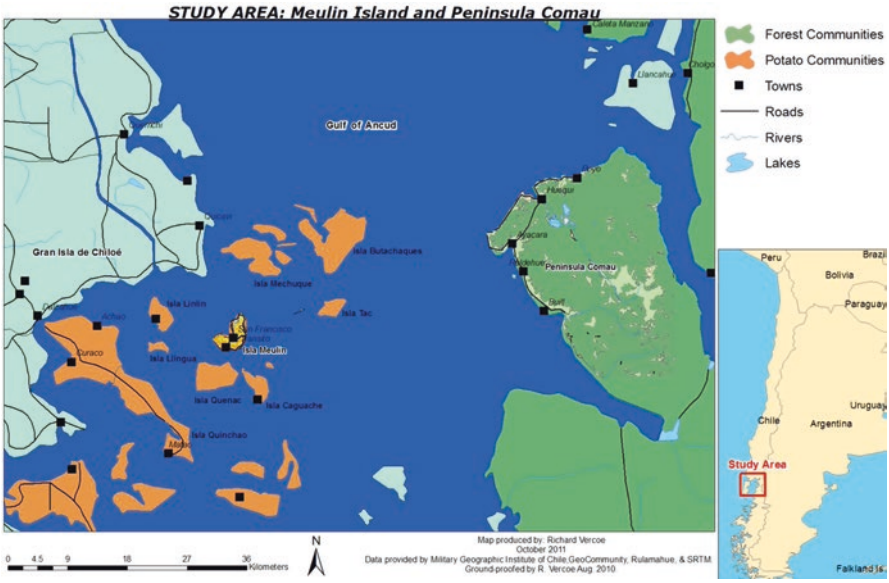

Fig. 5.1 Map of study area. (Map credit: Richard Vercoe)

Description of the Study and Area

The study covers 360 km^2 from the Comau Peninsula along the Andean mainland and west across the Sea of Chiloé to Meulín Island. This area is in the Tenth Region of the Republic of Chile, between 41 and 44 degrees South latitude and 72–74 degrees West longitude (Fig. 5.1).

Meulín Island is one of the many interior islands of the Chiloé archipelago. This network of islands has very limited relief (500 m maximum) and sandy loam soils, ideal for root crop production. The continental Chiloé area, as part of the Andean Orogeny, has a much more pronounced relief (up to 2500 m within a kilometer from the coast) marked by glacier-capped peaks along the eastern boundary. The soil composition of the inhabited lowland areas of the peninsula is characterized by boggy soils that contain much less sand and greater amounts of glacial till and gravels on igneous bedrock, resulting in very poor soils for crop production of any kind. The island areas receive about 1000–3000 mm of annual rainfall whereas the continental areas may receive several times as much precipitation, from 4000 to 8000 mm, due to the orographic effect of the Andean uplift. This high differentiation in precipitation between the islands and the mainland results in the islands maintaining an ideal balance of year-round growing conditions while the mainland area literally becomes saturated throughout the year resulting in soils that are flushed of their crop nourishing nutrients.

The Potato People

Meulín is one of dozens of interior islands scattered throughout the Gulf of Ancud between the big island of Chiloé and the mountainous fjordlands of Continental Chiloé. The island's low profile, rolling terrain, rich soils, and proximity to Chiloé's rainshadow protect it from the prevailing storms and strong seas arriving from the open Pacific Ocean to the west. This orientation provides Meulín with the optimum climatic and ecological conditions for potato cultivation. Its approximately 2000 inhabitants are dispersed fairly evenly over the island's 13 km^2. Two official communities (San Francisco and El Transito) each serve the rural population with limited services such as a school, church, and a pier as well as a few general stores operated as extensions to family homes. These stores offer basic goods such as cleaning products, food staples, and canned items, as well as, on occasion, fresh fruits and vegetables, depending on the season. All of these items are "imported" from urban areas to the north and have an elevated cost and due to limited transportation options in this remote region. The island's communities have a long history of potato production that is a vital sustaining component of their traditional horticultural and fishing lifestyle. Most of these long-inhabited islands of horticultural/pastoral legacy have been largely cleared of the dense temperate rainforests emblematic of northern Patagonia.

Local farmers such as Doña Luz and Don Pato typically trace their family lineage and land holdings back 300 years or so. Potato cultivation and animal husbandry are the primary horticultural activities of residents, while shellfish collecting and hand-line fishing are the primary marine activities. Due to diminished availability of mature trees on many of the smaller islands, potato-cultivators often struggle to separate their livestock from their farm fields. This often results in damage or losses to a percentage of their crops. Therefore, the demand for wood for fencing material is the most important factor driving Meulín residents to participate in the Chilote barter.

All of the interviewees on Meulín Island confirmed that the Chilote barter is currently active in their communities. The property sizes of the island interviewees ranged from 2 to 25 hectares in area with 0.25–1.5 hectares, respectively, dedicated to potato production and the remainder left to pasture (primarily sheep). The Meulín islanders are horticulturalists and pastoralists, exclusively working small-scale plots by hand without any mechanical or motorized tools. Those who were interviewed only used, altogether, 8% of their land for potato production at any given time; however, I found that, overall, 54% of the total land on the island is used for some type of agricultural production; 27% consists of shrubs or immature forest, 11% wetland, and 9% bare soil (the latter occurring primarily along the intertidal zone). The high percentage of agricultural land is largely due to the fact that the domestic animals (mostly sheep) require extensive pasture for grazing. Animal husbandry is not only the islander's primary source of protein but also provides limited cash income when animals are taken to the big island or mainland for sale (Fig. 5.2).

Fig. 5.2 Map of Meulín. (Map credit: Richard Vercoe)

The islanders keep sheep, chickens, and pigs, with sheep being the most common domestic animal, kept by all of the interviewees. Ten sheep required approximately one hectare without additional sources of feed such as hay, grains, or potatoes, according to Don Pato. Pigs and chickens were the next most common type of

livestock. These were penned in the evenings and during certain planting or harvest times, but otherwise left to roam within the property along with the sheep. The chickens and pigs were allowed to forage on the property as well as being fed discarded and leftover vegetable waste from the homestead. This results in a highly sustainable land management system that rarely requires external material inputs other than an occasional marine algae harvest along the shoreline to replenish nitrogen and phosphorous levels in the potato fields. The sheep not only provide meat but also wool for various domestic uses as well as rich guano to add to the fields as fertilizer. All of the interviewees that raise sheep said that they derived a limited cash income from the seasonal sale of some of their sheep to neighboring islanders and people from the mainland. This was generally the only, or at least the largest, cash income source on an annual basis for the islanders interviewed. This cash was then used to purchase essential items such as barbwire, tools, home furnishings, and other domestic materials that cannot be obtained by barter.

Potatoes in Their Environment

Meulín potato-cultivators achieve fairly high productivity by sharing labor among neighbors and using management practices based on traditional ecological knowledge developed over hundreds of years. The soil quality and temperate climate on the island provide an ideal foundation for crop success. Indeed, soil and climactic conditions throughout Chiloé are dramatically different from those of the rocky, nutrient leached, and boggy rainforests of the mainland peninsula. Productivity rates for potatoes are approximately 7500 kilos per hectare and were determined using estimates from several interviewees. For example, Don Pato's most recent harvest yielded seventy 50 kg sacks of potatoes from a half hectare parcel. The 50 kg sack is the standard unit of measure in the region for storage, transportation, and trade.

The island's sandy loam soils are well-suited for growing crops such as tubers. The soils maintain their nutrient load well and receive an annual rainfall of 2000–4000 mm, which is half that of the cloud-wringing, mountainous peninsula just 80 km to the east. The finer, more porous and even textured soil of Meulín also facilitates cultivation by hand tools, such as digging-sticks and long-handled hoes. Sandy loam soil can support a rich nutrient base. Potato-cultivators maintain soil health not only with sheep guano but also by turning-in marine alga when preparing the soil to further supplement the nutrient base. All of the interviewees rotated their potato fields either every year or two to reduce the permanence of soil-based plant pathogens. No irrigation, chemical fertilizers, or pesticides were used by any of the families that I interviewed.

There are at least 12 native potato varieties currently propagated on the island. Most can be found in each of the farmed fields any given year, but proportions of each vary between farmers. The exact number of total potato varieties on the island is unknown, but Don Cloro identified a dozen by name during the interview, and

Image 5.1 Potatoes of Chiloé. (Photo credit: Richard Vercoe)

several other respondents confirmed that number. Currently the *pie amarilla* (yellow foot) and the *mechuña* (purple stain) varieties are the preferred ones for cultivation based on their taste, resistance to disease, and storage longevity. All of them are considered native to the area, and there are currently no industrial potato varieties cultivated by any of the interviewees. In fact, all of the interviewees had tried industrial varieties in the past for one reason or another and unanimously preferred the local varieties for taste and texture (Image 5.1).

The farmers articulated two reasons for preferring native varieties to industrial ones. The first was that industrial varieties were much more susceptible to disease, rot, and more sensitive to varied conditions of water, soil health, frost, or sunlight. Farmers saw them as "higher maintenance" than their locally adapted varieties. They also stated that industrial varieties were dependent on the chemical fertilizers that were originally provided to the farmers when they were first introduced as part of state-sponsored agricultural and rural development programs. However, once the programs ceased providing the chemical fertilizers, the farmers found it difficult to maintain the crops with their traditional resources and methods.

The second reason was the poor taste and consistency of the industrial varieties. The islanders described them as being tasteless and having a gritty, grainy, or mealy consistency that often resulted in them falling apart when cooked. This perception was corroborated by the mainland traders who refused to accept the industrial varieties in exchange for their wood. The selective power of taste and preference for the native varieties over the industrials is a testament to the influence that the regional barter system has, in this case an influence that supersedes that of the national currency and marketplace. If not for the relative isolation of this region from commercial markets, the locally less desirable industrial varieties might have replaced the native ones as an export crop.

Días Cambiados

Both the wood-traders and the potato producers identified a cultural practice called *días cambiado* (day exchanged) as a fundamental part of the mutual aid they rely on to help cultivate and/or harvest the products they bring to the barter. It is common practice on the peninsula for one neighbor to help another harvest wood, gather a load sufficient for a trip, or transport another's wood for trade. On the islands, shared days preparing fields, planting, and especially harvesting the potatoes are all common labor-exchange activities by the potato producers. According to Don Pato, the *días cambiado* tradition has a long history in Chiloé and is essential to the success of his community as a whole. It enables each family or individual the opportunity to maximize productivity and maintain social connectivity. These two points were corroborated by all of the other interviewees.

A *días cambiado* is essentially a labor barter between neighbors, a type of *minga*. The exchange is usually an exchange of equal services for equal amounts of time. This labor was performed by men and women (70% men and 30% women of those surveyed) in the case of the potato-cultivators. According to interviewees, the most common day exchange occurs during potato planting and harvesting season. Several neighbors convene at one property to help prepare soil, plant, harvest, or carry a harvest to storage. The host is expected to serve visiting day exchangers three meals and several maté tea breaks and often a bit of homemade hard cider (*chicha*) at the end of the day. The meals and tea breaks are ripe opportunities for dialogue over topics and activities pertinent to the community's livelihood. The host will reciprocate the labor for every person that worked on his/her behalf if possible. Doña Luz shared that the social support and interaction from this type of minga is even more important for her now that she is a widow who tends her land alone. She is not able to perform the heavy lifting required to harvest her potatoes, provide for her two pigs, and trade for fencing and firewood.

The interview results from my research suggest that the *días cambiado* appears to be practiced more frequently and has great social significance among the island farmers than more remote mainland wood-traders. This may largely be due to the greater density and accessibility of the island communities, as well as the nature of the more predictable seasonality of the potato harvest. Beyond the peculiarities of each activity, the *días cambiado* both increases individual productivity, whether for potato-cultivators or wood-traders, and provides vital social connectivity in rural and isolated landscapes.

People of the Forests

The 612 km^2 Comau Peninsula sits at the base of the Andes Mountains and forms the mainland boundary of the Sea of Chiloé, approximately 80 km east of Meulín Island. This region contains some of the largest swaths of virgin coastal temperate

rainforest remaining in the world (Nahuelhual et al. 2007). The Comau Peninsula has experienced more recent habitation than the islands. Living within the confines of a very formidable and largely intact virgin temperate rainforest, these remote peninsula communities are more culturally and economically isolated than most communities on the Chiloé archipelago. The inhabitants of the peninsula rely on the dense coastal temperate rainforests that cling to the steep coastline, in addition to fishing, to provide for their subsistence lifestyle. All of the approximately 2200 inhabitants live within half a kilometer of the coast, leaving the rugged, rainforest interior almost entirely untouched (Fig. 5.3).

Analysis of LandSat remote-sensing imagery determined that 85% of the 612 km^2 Comau peninsula is covered with native forest. This value was corroborated by anecdotal descriptions from the interviewees. The land-cover data identified an additional 14% of the total area as shrubs. The ethnographic and field data determined that this GIS layer was misidentified. All of interviewee sites were located at the outer edge of areas identified by this classification. The interview information was combined with site visits that included GPS referenced photographic records. The integrated data identified much of the coastal shrub area to actually be cleared-forest used as sheep pasture and general living space surrounding homesteads. The ethnographic ground-proofing of the land-cover data reduced the total shrub coverage by half resulting in 7% shrub coverage and 7% agricultural land. The analysis concluded that only 7% of landscape on the peninsula is significantly altered due to human activities.

There are four communities on the Comau Peninsula: Ayacara, Buill, Huequi, and Poyo. These communities are linked by a single dirt road that provides access to basic services for the rural households spread along the shoreline. The difficulty of producing a stable food source on the Comau Peninsula is the most important ecological factor driving the participation of the wood-traders in the Chilote barter. The rain drenched soils found on the peninsula are generally flushed of nutrients and saturated with water much of the year, creating bog conditions that are neither productive for crops nor tolerant of grazing pressures. Several interviewees identified poor soil conditions and high precipitation (up to 8 m per year), due largely to the moisture wringing effects of the nearby Andes, as reasons for limited production capability on the peninsula.

All of the wood producers interviewed explained they had a small potato patch on their land, but that it was never productive enough to sufficiently provide for the family and was often prone to failure due to soil saturation, poor nutrient conditions, as well as mold and fungus outbreaks. Locals such as Don Oscar and Don Edelmo described the potato fields of the island potato producers to be less humid, have a more sandy loam texture, and be more productive than any of the peninsula's soils. Woodland locals describe the potato-producing islands in almost mythical terms, as a land where an endless variety of tasty potatoes grew effortlessly among rolling pastures containing well-fed sheep grazing on lush grasses, but not a tree to be found. The preference for the taste of the local Chilote potato varieties and the ability to obtain the staple food item without cash are the primary cultural and economic factors driving the wood-traders' participation in the Chilote barter.

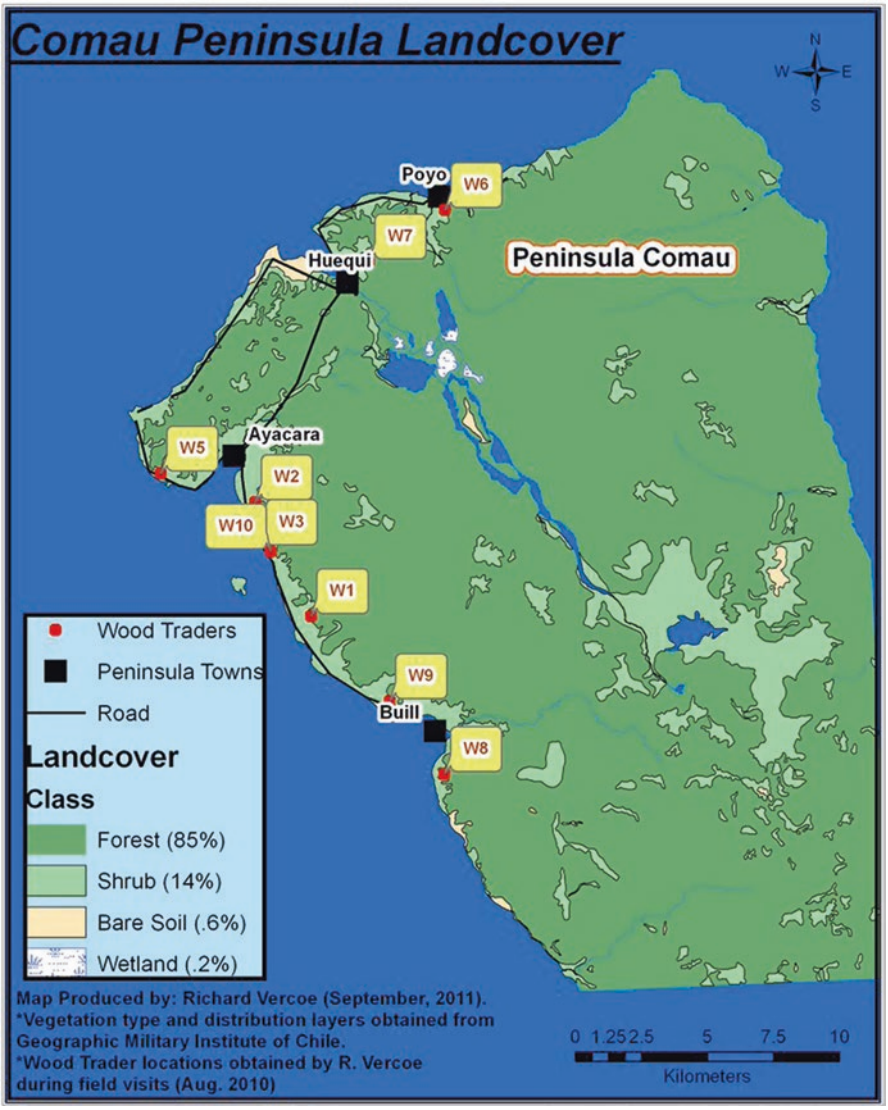

Fig. 5.3 Map of Comau Peninsula. (Map credit: Richard Vercoe)

Chilote barterers can be found in all of the communities on the Comau Peninsula. Four of the ten wood-traders interviewed came from the main town of Ayacara. In addition to the information they provided, they helped me establish other wood trading contacts in the neighboring coastal towns of the peninsula. The most common item that was sourced for barter by the woodland communities was wood for fence posts. Each post is made from a tree trunk 10–15 cm in diameter cut into 2 m lengths.

Common harvesting and removal techniques consist of axe felling and shoulder-carrying, with the occasional use of oxen. Only one participant used a chainsaw to cut the harvested trunks to post length prior to loading them on the boat. All others used an ax for all of the wood processing, from felling to limbing and trimming. Chainsaws and the fuel they require are prohibitively expensive for this largely non-monetary lifestyle and thus more of a luxury in the region. Don Gabo, Don Samuel, and Don Chochi all made use of oxen to drag bundles of ten to twenty 10 m long trunks at a time, but it was most common for harvesters to shoulder-carry the trunks one or two at a time, using only a thick wool sweater as padding.

The most common tree species harvested for posts are the luma (*Amomyrtus luma*) and tepú (*Tepualia stipularis*). Luma is from the myrtle family and can grow to 20 m in height. It is favored by wood-traders for its multiple trunk growth form and quick asexual regeneration. This dominant understory tree species favors high regeneration rates as well as year-round harvestability. The luma is also one of the more rot-resistant species found in this humid climate. Luma fence posts are alleged to last between 10 and 20 years, depending on the location and environment in which the post is placed. Even when cut and limbed, fresh-cut fence posts commonly exhibit a limited regrowth if set in fertile bare ground. The ability to regrow may further extend the wood's longevity for up to a decade. Luma grows in thickets and has thin flexible branches with small evergreen leaves. The wood type and flexibility make it convenient to harvest by axe and shoulder-carry.

Tepú, also a member of the myrtle family, has a larger average diameter (20 cm) but lower average height (10–15 m) than the luma. Like the luma, the tepú has an abundant distribution and quick regeneration rate. One major difference is the tree's longevity. One post can last 20–30 years in the ground. Luma, however, is preferred by both the wood- and potato-traders. Wood-traders like its smaller size, ease of harvest, and transportability. Potato-traders find the exchange rate for luma preferable since they get more posts per sack of potatoes.

Luma and tepú trees are said to regrow equally well in disturbed and undisturbed climax forest. Don Samuel explained that in order to avoid overharvesting a particular area, his family selectively cut different areas on a 10-year cyclical rotation. He said that this practice had been handed down over the generations, taught from father to son. Don Samuel was actively teaching his son and grandson this selective harvesting technique in order to maintain a sustainable practice for future generations.

I found the average property size of participants was 56 hectares, with a high of 120 ha and low of 20 ha. Of this area approximately 80–95% was forest and the remainder was cleared land for the home, some sheep grazing and a small vegetable garden. Don Chochi maintained 30 ha out of 120 hectares cleared for grazing cattle and sheep. He was the only interviewee that raised cattle on the peninsula.

The Making of Forest Waterways

One day Don Samuel invited me along for a full day of luma harvesting in preparation for a barter voyage. The family maintains a pair of oxen for load-bearing tasks around their property. They use it, for example, to transport items to and from their boat that is anchored about a kilometer from the house. I accompanied Don Samuel and his two sons. One son—the captain of the family boat—was in his mid-twenties, the other in his early teens. We spent several hours at the beginning of the day trying to locate the oxen that had been turned loose into the forest to forage. The coastal temperate forest of that sector is dense from ground to canopy, with many intermediate layers of native bamboo stands, the multiple-trunked luma, and tepú mid-canopies, all within the canopies of the larger birch and beech species. Moving through the understory and on top of boggy and muddy ground is challenging, especially when trying to carry an ax or haul 10 m long trunks. The forest is even more impenetrable when trying to move two yoked oxen pulling 20 or 30 of these trunks.

Don Samuel's family practices a traditional Chilote land management technique. They utilize their land's natural features and topography to develop small waterways by which to transport harvested wood. Pulled by the oxen, the wood partially floats down cobbled, clear streams. Year after year, as the family moves around the forest, they travel along small drainages in the undulating landscape and remove dense shrub layers. Because of this movement, peat moss and small grasses are eroded by heavy rain, run-off, and disturbance, thus creating a specific network of small stream channels of approximately 10–20 cm deep (depending on the rain that day), about 2 m wide (the width of an oxen team), eroded down to the cobbled glacial till and bare rock substrate rather than the knee deep mud and peat bog.

In order to harvest, the family, with its oxen, walks up a waterway until a desired location is found. Family members fan out into the forest to cut and limb tree trunks and then carry them by hand back to the oxen waiting in the waterway. When about 20–30 limbed posts are harvested, they are stacked together and chained onto the yoke between the oxen, and the team half-drags/half-floats the bundle out of the forest toward the house. The entire harvest outing, from finding oxen to harvesting and returning home to buck trunks into posts, takes 3 men approximately 8 h and yields 200 posts (Image 5.2).

Analysis of the remote-sensing imagery was unable to pick up any signs of these manmade waterways. This was expected considering the satellite imagery's 30 m resolution combined with the area's dense canopy coverage. This is where direct field documentation served well, not just for the value of ethnographic data but also for documenting a little-known, traditional land management technique that has a localized ecological impact on water quality and distribution, vegetation, and soil erosion. However, the waterways follow natural drainage courses in low relief areas and do not appear to erode any further than the initial 30 cm of topsoil down to the cobbled and hardrock substrate. The interviewees claim that the waterways reduce overall impact on the forest by channeling foot and oxen traffic along these narrow, nonvegetated corridors rather than typical forest travel that requires cutting and

Image 5.2 Transporting posts down waterways. (Photo credit: Richard Vercoe)

breaking of vegetation and branches along constantly varying travel routes due to the dense vegetation.

The Trading Voyages

Trading voyages can be quick and productive, or they can be fruitless feats of dash and daring across rough seas with not a single trade made. Whatever the results, the goal is the same: trading wood for potatoes and other products. I accompanied Don Samuel and his two sons on a trading voyage in early August (mid-winter). We had trouble finding people with potatoes available to trade, and we had to navigate through a Patagonian storm so fierce that literally all of the ports in the region were closed by mandate of the Chilean Navy. Long days and nights were spent keeping the small cargo boat afloat with its load of potatoes and wood. For several days the four of us slept, cooked, and maneuvered the boat in rough waters, driving rain, and biting winds. Daily forays ashore in search of islanders with potatoes to trade yielded many stories and granted us insights into the life experiences of Chilotes living among the seas, storms, and mountains of Patagonia (Fig. 5.4).

My research found that all trading voyages are initiated exclusively from the wood-provider side of the network. Ecological conditions such as the peninsula's low crop productivity encourage the barter. Raw materials for boat construction

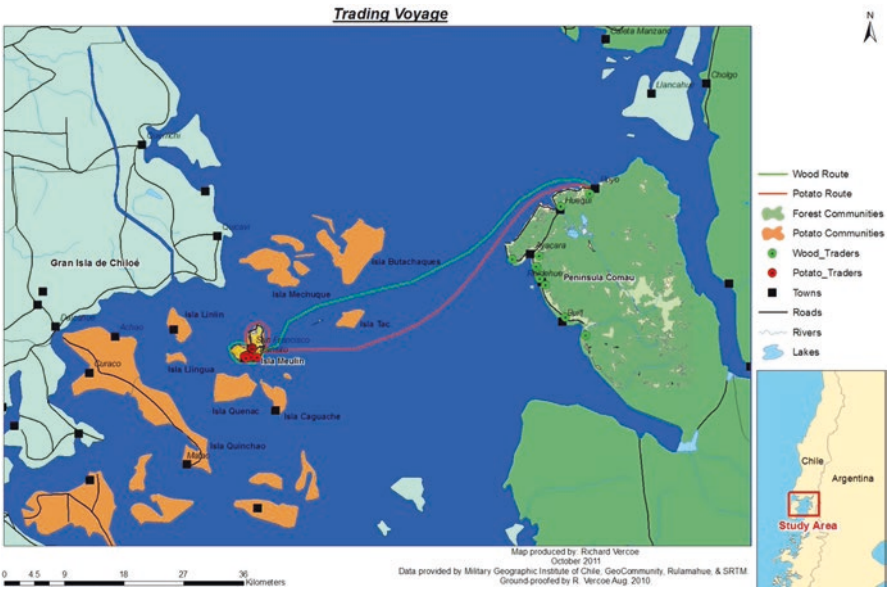

Fig. 5.4 Map of trading voyage. (Map credit: Richard Vercoe)

only exist on the peninsula, thus voyages are initiated from the side that has the better ability to travel. A wood-trader may combine resources with a neighbor in order to fill a boatload of material if they are unable to obtain a full load on their own. Once the potatoes are traded for, the boat owner will "charge" a prearranged amount of potatoes as a handling fee and pay the remainder in potatoes to the neighbor. All wood-traders confirmed a preference for sharing resources and collectively harvesting enough wood to fill a boat. Don Edelmo and Don Samuel, however, preferred to harvest and prepare wood within their family unit. These families had sufficient resources and labor power—a father and several sons—to complete the work on their own, thus simplifying the trade.

Chilote boats are hand-made, hewn by the owners, and constructed from several species of local wood found mostly in mature forests on the peninsula. Traders interviewed for this research used boats ranging from 8 to 12 m in length and 3–4 m wide. The design of a traditional Chilote boat requires large mature timbers. Each boat owner builds their vessel primarily with trees felled on their land. Neighbors help with the labor and by occasionally providing some of the wood if necessary. Labor assistance from a neighbor is treated like the *días cambiados* arrangement practiced on the islands (Image 5.3).

Boats today are powered by small marine motors rather than the sails and oars of earlier times. Trading voyages maximize cargo loads and time commitments in order to justify fuel costs. Smaller boats, such as Don Eliodoro's launch (8 m × 2.8 m) had a capacity of 150–200 luma posts (10 cm × 2 m each), and on return could fill its hold with twenty 50 kg sacks of potatoes (1 metric ton). Some of the larger boats

Image 5.3 Hand hewn boat used for fishing and trade. (Photo credit: Richard Vercoe)

had a capacity of 700–800 posts or approximately 4 metric tons of potatoes. Don Samuel's cargo/fishing boat held 500 posts on our trip.

Wood-trading boat owners are also registered fishermen. Their catches serve as a vital source of protein for the peninsula forest communities where agricultural production is severely limited by environmental conditions. Fishermen recognized by the state as artisanal are allowed to fish for commercial sale and are limited by a monthly quota established by state agencies and apportioned by local fishing unions. The typical monthly commercial returns generate just enough income to cover fuel costs, with some cash leftover for additional domestic purchases. Given that they have a lower agricultural workload as compared to the islanders, the forest communities dedicate more time to the construction, maintenance, and operation of their boats, and to fishing activities.

According to all of the wood-traders interviewed, the winter months of June, July, and August were typically when they embarked on trading voyages. This coincides with seasonal storage of potatoes after the fall harvests when supplies are most abundant and farmers have already made allocations for next season's planting and their own subsistence needs. The short days and rough sea conditions of winter lead to decreased fishing activity, thus time available for trade. Don Rene and Don Vitoy both indicated that that time of the year was ideal for potato producers because they were not yet preparing their fields for the following season's crop.

Wood-traders said they typically choose to initiate a voyage once a boatload of posts has been prepared and the weather is conducive. Only one trader, young Rigoberto, indicated he had prearranged his voyage via mobile phone. The others made the voyage without prior notification to the potato islands. All traders sailed to the islands for barter once each winter to acquire sufficient potato stores. Only 30%

of those interviewed made more than one trip—between two and four per year—in which loads were shared with neighbors or extended family.

The New Year was another time specifically mentioned as an active trading season. That's when a limited harvest of "new potatoes"—small, delicate, early-maturing varieties that are planted earlier than the main crop—become available. These delicacies are a favorite item for early summer Christmas and New Year's festivities in the region. Twenty percent of the wood-traders make these special voyages with high-quality posts (straight and thick) to trade for limited sacks of new potatoes and perhaps some hard apple cider. Unfortunately, wood-traders sometimes only return with dregs of last year's potatoes.

The maritime voyages are often the most memorable and venturesome parts of the trading process. A typical voyage takes at least 3 days, maybe longer, depending on two factors: the ability of the wood-trader to find potato-cultivators looking for products, and the weather. Depending on the wind, waves, and currents, the sea crossing can take from 6 to 12 h. Speed and stability are primary factors limiting the geographic range of the trade network for these hand-hewn, small-motor boats with limited fuel-carrying capacity traversing rough Patagonian inner seas. Sailors prefer to travel within a day's journey of their homes for safety reasons and because of fuel capacity limitations.

Two older traders in their seventies and eighties recounted the time it would take them to sail across the seas when they were young. On a good day, they said, they could match the speed of today's motor boats. But the sail was always at the whim of the wind. Nowadays, most boat operators all carry marine band radios for emergency communication (however, none of the 10 boat owners interviewed had GPS navigation systems and only half had marine charts for navigation). Navigation in this region is done either by sight or compass bearing and time.

Trading a full boatload of wood for potatoes in a single day is often possible. When that happens, wood-traders can again set return sail early on the third day. If barterers have difficulty finding trading partners, they might have to sail to several different parts of one or more islands, requiring additional time and resources. Depending on the design and capacity of the boat, the traders may sleep onboard, anchored just offshore in a protected port or bay, or they might stay in the home of one of the potato-producing families they know. During the winter, it is common for strong storms to form quickly, forcing small and underpowered boats to seek shelter in protected coves, sometimes for several days at a time.

Barter

Barter is a transformative act that moves objects, which are different in kind, between "regimes of value" sustained by free and equal actors (Humphery and Hugh-Jones 1992). Direct barter is an exchange network that does not incorporate symbolic valuations (currency) or indirect transactions (credit) that could lead to power inequalities. The typical resource transactions occurring in barter systems

have rates of exchange that are mutually agreed upon by the participating parties rather than commoditized, abstracted, and nonnegotiable values. The barter exchange of goods based on equal participation results in minimal cultural or personal transaction costs and is reinforced by the possibility of repeated future transactions resulting in trustworthy and consistent trade relationships (Cellarius 2000).

The limited "market" and intimate nature of participant relations in the Chilote barter network reduces resource exploitation pressures than that of a more commercialized trade where individual responsibility to maintain one's own land is diminished. Each of these traders only has the resources available to them that their land can provide. In the case of the Chilote culture, there is great importance placed on practices that keep the land in maximum health for future generations and to not overexploit resources for short-term gains. Additionally, there is no real incentive to accumulate either the potatoes or the wood since their respective value beyond personal consumption is only in trade for the other as needed. The direct exchange and shared valuation of goods also serves a self-limiting function with regards to the spatial extent of this trading network. The participants in this trading system have a specialized knowledge and utility for the resources. Therefore, trading networks such as the Chiloe potato-wood barter are naturally limited to either local or regional scales in which both products are produced and able to be exchanged with minimum transportation costs. This, in turn, dissuades overextraction due to travel time, the environmental risk of the often tempestuous Patagonian inner seaways, and the relatively high fuel costs in this remote region.

The Chilote Barter

Three core components were identified as a result of this Chilote barter research: set social behaviors, primary barter items with specific exchange rates, and the ability to accommodate unique or specialized trades all without the use of currency. Both wood-providing mainland traders and the potato-cultivating islanders identified these as commonly shared characteristics of the Chilote barter process. As we have seen in the discussion of the voyages, the wood producers are predominantly the initiators of barter by sailing to the islands with a boat full of posts. Rigoberto and Don Samuel were the only two wood-traders that sometimes used cell phones to contact island traders prior to departure. Don Samuel said that it was important for him because he would sometimes build and trade special wood items—animal feeding troughs and wooden plow blades, for example—upon request by his regular contacts on the islands. He said that prior to cell phones, they would take orders for special items from one journey to the next, which meant waiting many months or even a year before the wood-trader might return with the item. All of the other wood-traders stated that they loaded their boats with what they thought were most generally needed items (fence posts and firewood), sometimes having specific quantities already allocated from requests made during the prior trip.

Upon arriving to the coast of an island, the wood-traders would anchor far enough offshore to avoid getting beached during the high daily tidal ranges of this region. Someone would stay onboard at all times to maneuver the boat—either for safety reasons or to sail it around to a property once a barter was arranged by the landing party. The Chilote barter social dynamic became apparent as soon as the mariners made for shore. Usually, the elder family member would lead the landing party. They would begin by visiting known acquaintances to inquire about trades. Each visit began with an extended conversation with the head of the house, typically inside the home of the islander, seated around a table sharing a cup of máté. Gender did not appear to be a significant factor in establishing a potential trading partner. More important was whether the person engaging in the conversation had decision-making power as a head of the household. Two of the five observed trades involved women heads of house. Casual conversation could last up to an hour before any discussion of actual trading would begin. This format was repeated in all five of the observed trading meetings that made it past the initial point of establishing mutual interest.

Eventually, the conversation would shift to the actual trade and was initiated by either the wood or potato provider. If the potato provider did not need any wood or did not have any potatoes or secondary commodity to trade, the wood-trader would inquire about whether the islander knew of other individuals who might be interested and able to trade. An unsuccessful trading visit could take between 30 min and an hour and a successful negotiation between two interested parties could last several hours and include a meal together at the islander's home. Neither the wood-traders nor the potato-cultivators identified any family or marriage relations that determined their trading partners. Both sides had one or two preferred trading partners that they felt provided a good product, but they were not averse to trading with new contacts offering good quality items to exchange.

Core items of the Chilote barter have specific long-standing exchange rates that are characteristic and specific to this network. The exchange rates are mutually understood baselines from which all trading negotiations begin. The most common exchange rate used is ten luma posts (10 cm × 2 m) for one sack of potatoes (50 kg). Tepú posts fetch a rate of eight posts/sack due to their larger diameter and greater durability. Wood-traders often bring curved, twisted, and split posts to trade as firewood, which has an exchange rate of 1 m^3 for a sack of potatoes. The posts are evaluated by the potato farmers for straightness and the presence of any splitting. These two qualities are primary determinants by the potato-trader as to the final rate of exchange to be accepted. A straight post is preferred for driving into the ground by hand and for securely attaching wire or cross-poles. Split posts are likely to rot sooner than intact trunks with their protective bark in place. Splitting also indicates that the post was not cut recently and will likely not regrow once placed in the ground therefore reducing its potential longevity as a "living" fence. Noticeably curved or split posts will generally require a two-for-one value in counting toward the 10 posts/sack baseline. This plasticity of adapting to specific characteristics in the goods exchanged is never overtly expressed but is quickly introduced when necessary. The general custom is for an interested potato-trader to head out to the

beach or onto the boat to individually choose and select the posts before bringing the wood-trader back to the storage shed where the potatoes are stored. This provides a point of entry for one of the two participants to begin assessing the quality of the goods and begin altering the exchange rate if needed.

With respect to the wood-trader's priorities, the potatoes must be free of bruising and any visible rot, mold, or fungus. It is customary for the wood-trader to personally load the 50 kg sacks as they select the potatoes from a central pile. Once the traders have made their selections and agreed on the rate, they transport the items, often with the help of neighbors and the crew members of the boat. This act of respect and mutual aid occurred for each of the successful trades observed.

Potato-cultivators try to produce enough annually to meet four basic needs: to have sufficient harvest to feed the family until the next, to have seed potatoes for the next planting, to supplement animal feed (usually pigs), and to have 5–20 sacks for trade for fence post and firewood. Doña Erika allocated her harvest of 80 sacks produced on half a hectare for a family of five in the following manner: 50 sacks for family consumption, 10 sacks for seed, 10 sacks for pig feed, and 10 sacks for trading. The traditional way to ensure a minimum harvest needs is to plant a diversity of varieties to account for variations in climate or soil and pest conditions from year to year. I found that the Meulín Island farmers cultivated six to ten different potato varieties on average. The difference in which varieties each farmer chose depended on the particular environmental conditions of their fields as well as personal taste. This dynamic of social and ecological variables used for determining the varieties and quantities of potatoes produced by each farmer is an important contributor to the high agrobiodiversity for which this region is known for.

The third characteristic of the Chilote barter is the ability to accommodate unique or specialized trades all without the use of currency. If the islander does not have any potatoes to barter, but is in need of posts, he or she may offer some alternative items that may be of interest to the wood-trader. Livestock is usually the default alternative offered by an islander. A 20 kg lamb will likely get 20 luma posts or a 15 kg piglet could fetch 30 luma posts. I witnessed a particular barter in which Doña Erika had too limited a store of potatoes to trade. While passing through the front pasture on the way out Don Samuel inquired about a piglet and was shortly on his way back to his boat with a bound piglet in exchange for 20 luma posts and 10 tepú posts. All of the farmer interviewees also planted a limited number of seasonal vegetables in gardens near the home. The garden items included carrots, beets, cabbage, and native elephant garlic. If they had a surplus of these items at the time that wood-traders visited they would sometimes include these items for trade.

These alternative trades are much more closely tied to the specific needs and interests of the two parties. A young piglet will require many months or years of care and feeding before it will be worth its weight in meat, whereas potatoes store well and require no further resources or labor. During the New Year's voyages when new potatoes are limited, wood-traders are often eager to trade their finest posts for a few liters of an islander's specialty hard cider (*chicha*) made from low-growing, but very hardy crab-apples. Ten luma posts will fetch 10–15 liters of 6–10% alcohol

cider. Homemade hard cider is a highly cherished holiday beverage throughout the region and stores well.

The Chilote barter facilitates the exchange of vital resources while maintaining a flexibility for alternative goods to be introduced when necessary. The different ecological limitations imposed upon each side of the barter network creates a dynamic system of mutualism whereby each trader is dependent on their counterpart to provide items essential for continued success in an area of limited means. The direct and intimate nature of the Chilote barter process nurtures social relations while maintaining the ecological vitality from which it was derived. The persistence of this barter system provides a degree of economic self-sufficiency and regional sovereignty for communities of an otherwise economically underdeveloped corner of the world. The Chilote barter network provides a living link to historic forms of sustainable commerce and resource exchanges that have existed for hundreds and thousands of years. Perhaps even more timely is that it also illustrates the viability of alternative local and regional resource economies that are less vulnerable to global market forces while meeting essential needs for poor households.

Conclusion

This research found that the Chilote barter is still actively practiced. However, the extent to which it is still affectionately referenced and mythologized is much larger than the area and population that actually still engages in the practice. The spatial area of extent is currently limited to trade between the nearest mainland and island communities that produce wood or potatoes. In this case, a range of 60–100 km between trading partners was found to be the geographical extent of the trading network. This was due primarily to the transportation capability and safety of the wood-traders' boats for navigating the challenging inner seas of northern Patagonia. A population of approximately 30 wood traders and 50 potato growers are those that were identified during the course of this study.

The distinct ecological characteristics of the two areas that make up the trade network are what largely drive the Chilote barter system. The mainland forest ecosystem has low horticultural productivity levels but high productivity in the form of woody biomass due to the intact native forest, high precipitation levels, and poor soil quality. The Comau Peninsula's inability to produce a stable food source is the most important ecological factor driving the participation of the wood-traders in the Chilote barter. All of the wood producers interviewed explained they had a small potato patch on their land, but that it was never productive enough to exclusively provide for the family and was often prone to failure due to soil saturation, molds and fungus outbreaks, and poor nutrient conditions. However, the dense coastal temperate rainforests of the peninsula provide ample material for non-horticultural activities such as fishing and trading of wood products.

Meanwhile, the island communities practice a well-developed horticultural-pastoral system that provides a limited surplus of staple foods such as potatoes and

Image 5.4 Sheep, fence, and potato field on Meulín Island. (Photo credit: Richard Vercoe)

sheep. The historic and continued clearing of large woody biomass such as trees makes the islanders dependent on mainland sources for essential land-management resources such as fence posts. The resulting dynamic is a nonmonetary, direct-exchange of regional resources through ongoing trade relationships reinforced through specific cultural practices and behaviors such as the maté tea session (Image 5.4).

The Chilote barter facilitates both an exchange of necessary natural resources and a system of social continuity within and between remote communities. Both parties honor preexisting exchange rates but recognize that the final exchange rate may vary according to how the participants evaluate the individual products to be traded and the personal needs of each participant at the time. The final satisfaction of the transaction is achieved not only by obtaining the desired material resource but also by fulfilling the related social needs as well. The 10 posts for a 50 kg sack of potatoes exchange rate is identified by all of the traders as a long-standing base-rate upon which every negotiation begins. This could be called an equilibrium exchange rate, a balance between what the natural system consistently provides and that of the human resources and labor involved in cultivating and transporting the goods. This exchange rate is reflective of a natural carrying capacity of the socioecological system for each of the traded products.

However, the traditional exchange rate is not necessarily the final exchange rate. The intrinsic social dynamics of barter must also be factored into each exchange. A barter must be viewed in light of its social context as well as its material practice (Humphery and Hugh-Jones 1992). Due to the personal nature of bartering, each participant's reputation is at stake for future trades. Therefore, a *socially* evaluated exchange rate is also present in any Chilote barter process. Thus, the exchange rate

considers the social value associated with the products in addition to their labor and use values. Examples of the social value include familial ties or religious/ceremonial connections between traders who attend major annual pilgrimages and holy days together.

Moreover, the "days exchanged" labor invested by members of each community to each family's potato harvest or boatload of wood creates a social accountability that both traders are intimately aware of. For example, during an observed barter negotiation, Don Samuel explained to Don Pato that he could not offer 12 posts for a sack of potatoes because he already traded with neighbors Don Sixto and Don Oscar for 10 posts per sack and it would jeopardize his future opportunities with the others if he accepted something different during the same visit. Such social considerations are a factor in the evaluation of the quality of the products being traded. In other words, the ultimate valuation of the wood or potatoes being exchanged is based not only on their natural qualities but also on their social qualities at the time of trade. The Chilote barter demonstrates an intrinsic awareness by the participants of not only an ecological equilibrium of the products traded but also an attunement of social relations that are continually cultivated and maintained by the exchange process.

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