SOCIOECONOMIC DIFFERENTIATION, LEADERSHIP, AND RESIDENTIAL PATTERNING AT AN ARAUCANIAN CHIEFLY CENTER (ISLA MOCHA, AD 1000-1700)

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The native populations of Araucania (southern Chile) never succumbed to Inka or Spanish conquest. But while independent indigenous sociopolitical structures persisted until the late 1800s, remarkably little is known about late prehispanic and early historical Araucanian sociopolitical organization. Lacking significant archaeological research, current reconstructions are based almost exclusively on European chronicles, and paint a bewilderingly varied picture of indigenous organization, ranging from a native Araucania made up of scattered autonomous kin units lacking any political centralization, to one consisting of powerful chiefdoms built on elaborate public display and macro-regional alliances among elites.

My research was oriented at producing a comprehensive understanding of Araucanian settlement and socioeconomic organization and social leadership through archaeological investigation of household variability and intra-community patterning at archaeological sites belonging to the El Vergel archaeological complex (AD 1000-1550) and subsequent historical reche-Mapuche (AD 1550- 1750) period. My research zone of 6 km2 was established in and around the site of P31-1, an ethnohistorically tentative chiefly center, on Isla Mocha (Chile). In this zone, a full coverage survey, intensive surface collections, and test pits were completed. Inter and intrasite analyses were made of ceramic, lithic, archaeobotanical, and faunal assemblages. The information gathered made possible assessment of several current constructs of native Araucanian sociopolitical organization.

The fieldwork revealed the existence of three communities (sites P29-1, P31-1, and P5-1), which were relatively autonomous socially and economically. If there indeed was a paramount chief at P31-1, the centralizing effects of this office were very weak. The research produced no evidence for social inequality based on wealth finance activities (in exchange or

craft production), wealth accumulation, or even markedly different household activities. At both P29-1 and P31-1 excavations revealed small but pervasive wealth differences among residents, seen in variability in consumption of higher value pottery, better stone tool material, and in diet. These muted wealth differences, when combined with the presence of two mounds and a sizable platform, suggest patterns of native social differentiation and leadership based on prestige and ideology, rather than forms of economic control.

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PREFACE

This project on Isla Mocha was supported by the National Science Foundation (Dissertation Improvement Grant BCS-0956229). In addition, support for preliminary investigations in southern Chile and Isla Mocha in 2006 - 2008 were provided by a Graduate Student Field Research Grant from the University of Pittsburgh's Center for Latin American Studies, an International Studies Fund Research Grant from University of Pittsburgh's University Center for International Studies, and a Pre-dissertation Small Grant from University of Pittsburgh's Department of Anthropology. My dissertation project was authorized by the Consejo de Monumentos Nacionales under the permit Ord. No. 248 of January 12th, 2009.

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1.0 INTRODUCTION

The native populations of Araucania, southern Chile never succumbed to Inka or Spanish conquest. But while independent indigenous sociopolitical structures persisted until the late 1800s, remarkably little is known about prehispanic and early historical Araucanian sociopolitical organization. Lacking significant archaeological research, other than the ongoing work of Dr. Tom Dillehay (2007), our current reconstructions are based almost exclusively on European chronicles and ethnographic analogy. These accounts paint a bewilderingly varied picture of indigenous organization, ranging from a native Araucania made up of scattered autonomous kin units lacking any political centralization, to that of a society organized into powerful chiefdoms built on elaborate public display and macro-regional alliances among elites. In general, all of these overly-generalized accounts have focused on the issue of “leadership” or the apparent lack of it. In contrast, my research aimed at producing a household-level view of both vertical and horizontal socioeconomic relationships in a specific late Araucanian population as a way to better understand processes of political leadership and community integration.

My fieldwork explored residential variability within and among settlements belonging to the El Vergel archaeological complex (AD 1000-1550) and subsequent historical reche-Mapuche (AD 1550- 1750) periods in a section of Isla Mocha, and island lying 30 km of the coast of Chile. Ethnohistoric accounts dealing with the island indicate the presence of two, coexisting native chiefdoms on the island prior to AD 1687. The island was largely depopulated after this date, creating a relatively undisturbed archaeological record. Before my fieldwork for this project, the island had been investigated by Quiroz and Sánchez (1997. Sánchez et al. 2004). However this investigation, including my own pilot survey in 2008, had revealed three distinct population clusters (including P 31-1, one of the island’s largest site and very likely the chiefly center discussed in early 17th-century ethnohistoric accounts) amid an extensive but thinly dispersed settlement; a public architecture site of two mounds on a platform; and possible community level craft-specialization in metallurgy at the site of P29-1. These findings created an opportunity for a problem-oriented project to test, modify, and extend aspects of the most recent and important constructs of Araucanian sociopolitical organization (Dillehay 2007). The research described here aimed at: (1) understanding how communities were integrated economically and socially; and (2) identifying processes underlying social authority and regional social integration.

To generate the needed data sets, I conducted a program of 100% survey and surface collection, intensive surface collection, and limited test excavations in a 6 km^2 zone. The fieldwork was designed to investigate communal and household-level differences in residential density, economic emphases, wealth accumulation, patterns of consumption, status, and ceremonial practices.

1.1.1 Social Leadership and Integration

The ways in which household strategies underwrite status differences is important to understanding the institutionalization of social inequality, how communities are integrated, and the nature of long-term social change. Drawing from the extensive theoretical literature on the origins of complex society, we can, for analytical purposes, divide the processes associated with status hierarchy and leadership into two broad categories: (1) economically based strategies; and (2) prestige based strategies. In economic strategies, power and social privilege are associated with domination over key resources such as agricultural products (staple finance), or over the production or circulation of craft goods or exotic, prestige items (wealth finance). Staple finance models stress the importance of elite accumulation of wealth through control of prime agricultural land or intensified economic production (Drennan 1987; Earle 1987b; Hastorf 1993). The political economy inherent to these models involves surplus mobilization by elites to support a privileged life style, or to fund the activities connected to political leadership. Wealth models stress the role of elites in dominating craft production and exchange of prestige-good or high-value items. Such goods are typically produced from a rare (and thus valuable) material, or are highly elaborate and labor-intensive to make (Brumfiel and Earle 1987; Earle 1987a; Peregrine 1991).

In prestige based strategies, authority and social privilege derive from elite's ability to dominate kin institutions, communal activities, and religious practices. Hierarchical relations are founded on ideology, rather than economic processes directly, so that elites may be powerful without being wealthy, or may express power in mobilizing labor and surplus for "communal" rather than private undertakings. In these societies, leadership is seen in claims on people, rather than in accumulating wealth, or directly dominating land or economic processes. Ritual systems are particularly important because ceremonies are the context in which such status differences are constructed and expressed (Aldenderfer 1993; Johnson and Earle 1987). As Johnson and Earle (1987:158) note, "an essential feature of… higher levels of integration is the reliance on ceremonies to define groups and their interrelationships." Ritual authority lies in the ability to organize and dominate ceremonial practices, including funerary ritual (Wolf 1990). An understudied aspect of the "claims on people" strategy is the obvious manner in which it might result in population nucleation around leadership. It has been hypothesized that chiefly residential sites grow to be larger than others, or have higher residential densities, as people congregate around the chief, "drawn by the centralized mobilization of labor and goods by the emerging elite" (Drennan 1995:9).

Therefore, an essential goal in investigating complex societies is determining how ideological and economic hierarchy found expression in social leadership and household activities. As detailed below, this goal is particularly relevant for Araucania, where ethnohistoric accounts document significant social hierarchy, and point to elite involvement in such things as monument construction, ancestor veneration, intensified agriculture, and control of craft production.

1.1.2 Social Variability and Integration

Of course, there is more to social variability than hierarchy, and my research sought to go beyond reconstructing leadership as part of understanding prehispanic Araucanian social organization. Power relations are only one aspect of the social variability that existed in any past society, together with differences in wealth, identity, and occupation. Even in relatively egalitarian societies, for example, craft specialization within a community may be the basis for household interdependence (Drennan and Peterson 2005, 2006; Feinman and Neitzel 1984; Fowles 2002; McGuire 1983; McIntosh 1999; Redmond 1998; Yoffee 1993).

In prestate societies, persistent inequality develops when some households distinguish themselves - - economically, socially, ideologically - - from others, and make the distinction from other households hereditary. As generations of archaeological and ethographic research has shown, the mechanisms of change that lead to the emergence of hierarchy are often rooted in household activities (Ames 1995; Arnold 1996; Byrd 2000; Clark and Blake 1994; Flannery 1972, 2002; Hayden 1995, 2001; Sahlins 1972). Elite households may or may not have very different domestic economies from those of commoners (in both production and consumption), but they are likely to be distinguished by greater involvement in ritual and leadership activities (such as serving/feasting and public ceremony). It is because persistent inequality has the potential to be rooted in many different forms of household social differentiation that studying the ways that "vertical" social differentiation relates to patterns of "horizontal" household social differentiation is useful to comparative understand of the dynamics of complex societies (Dillon 1985; Drennan and Peterson 2006; González 2008; Lilley 1985; Shelach 2006; White 1985).

We should want to investigate "horizontal" social differentiation, as well as social hierarchy if we wish to identify the ways in which strategies of leadership may arise from, or be connected to, particular modes of household interaction. Indeed, a strict focus on hierarchy, or the "vertical" relations within society (e.g. elites and power relations) alone, may obscure the more manifold forms of variability present in any society, particularly societies with shifting or multiple forms of leadership and social division, such as the Araucanians, whose political system Dillehay (2007:335-345) has described as a dynamic interplay of heterarchical, corporate, and hierarchical structures. Such an approach, too, is particularly relevant for Araucania, where the "top-down" concern with power relations and political leadership has overshadowed "bottom-up" investigation of other forms of social integration. Thus my research took aim at both perspectives, not only to provide a fuller understanding of Araucanian social variability, but also in recognition that social hierarchy only exists where elites are able to dominate relationships that integrate households and communities.

1.2 RECONSTRUCTING ARAUCANIAN SOCIAL ORGANIZATION

> *Our sources are so vague and often so conflicting as regards so much of the sociopolitical structure of the Mapuche-Huilliche that it is impossible to reconstruct therefrom a full, rounded, and consistent picture.*
> (Cooper 1946:724)

Sadly, the observation made by John Cooper in the Handbook of South American Indians is almost as valid now as it was 65 years ago. This is the case despite a corpus of studies of Araucanian socio-political organization, integration, power, and leadership written from either from an ethnohistoric and/or ethnographic perspective (Aldunate 1982; Bacigalupo 2007; Bengoa 2003; Boccara 1999, 2007[1998]; Casanova 1985, Coña 1984; Cooper 1946, Course 2005; Dillehay 1976, 1985, 2002; Faron 1956, 1961a, 1961b; Foerster 2004; Goicovich 2004; Guevara 1898-1916, 1913, 1925-1927; Latcham 1924; Leiva 1977; Melville 1976; Montecino

1980; Padden 1957; Silva 1984a, 1984b, 1985, 1995; Stuchlik 1976; Titiev 1951; Villalobos and Pinto 1985; Villalobos et al. 1982; Zapater 1974, 1978; Zavala 2008; Zavala and Dillehay 2010). Given the nature of the ethnohistoric accounts, any ethohistorically-based reconstruction of prehispanic or early historic Araucanian sociopolitical organization inevitably has the limitations of being at once highly biased, fragmentary, synthetic, and over-generalized.

Previous and current perspectives on social organization of the prehistoric El Vergel (AD 1000-1550) and the "reche-Mapuche" or ethnohistorical "Araucanos" (AD 1550-1750) remain largely based on ethnohistoric sources and ethnographic accounts. For a variety of reasons, archaeological research has been sharply limited, and knowledge of the El Vergel archaeological complex (AD 1000-1550) does not go much beyond naming ceramic assemblages (Adán et al. 2005; Dillehay 1990a, 1990d) and describing burial practices (Aldunate 1989). However, the scanty known archaeological record suggests that significant regional variability existed within Araucania in economic patterns, degree of sedentism, and political complexity as well (Adán et al. 2005; Dillehay 2002, 2007). As a result, any generalizations about social differentiation across Araucania, particularly through extrapolation from ethnohistoric sources, are overly simplified or misleading. As yet, there have been no archaeological studies focused on the topic of social differentiation, and archaeological settlement pattern, household, or mortuary studies remain mostly at a descriptive level. As a consequence, we do not know the time depth and characteristics of the sociopolitical order observed by the Europeans in the 16th and 17th centuries. Further, the ethnohistoric information itself suggests multiple axes of social differentiation, axes that were not necessarily congruent in ways that allow for easy recognition of the kinds of "chiefs" or "elites" that populate common archaeological models of complex society.

In discussing native Araucanian social organization, most historians and some archaeologists (Aldunate 1982; Casanova 1985; Goicovich 2004; Silva 1984, 1995) champion a reconstruction that emphasizes the lack of political centralization in an otherwise tribal-type system. In this reconstruction, multiple kin units or clans formed loose networks that constituted an autonomous regional unit called a *lebo* or *rehue*, and led by a headman or *lonko* ("head", in Mapudungun language); an individual with a certain level of prestige but no coercive power. In times of warfare, temporary regional alliances would form through confederation under a military chief or *toqui*. One hypothesis, extremely reminiscent of a construct proposed by Carneiro (1998), concerning the development of chiefly society, is that European contact (warfare) created the conditions for these war chiefs to become a permanent and institutionalized leadership, consolidating their power through the accumulation and redistribution of wealth.

An alternative perspective in Araucanian studies is exemplified in the historical anthropological studies by Boccara (1998, 1999, 2003, 2007). Several documents quoted by him sketch an early (pre AD 1650) four-fold division of society: the *ulmen* (*caciques* or chiefs), the *capitanes* or *capitanejos* (captains), the *cona* (warriors), and the *labradores* (farmers). The most ethnohistoric information is available for the first three categories, and Boccara focuses on these as the most relevant to his reconstruction of the "reche-Mapuche" society and ethos. The *ulmen* I describe in the next chapter. The *capitanes* or *capitanejos* were usually *ulmen* appointed to command *cona* squadrons. The *cona* are full-time warriors, who started their training around 12 years old, and ostensibly became totally disconnected from any other labor. The *labradores*, in turn, were the men engaged in agricultural labor, along with women and children. For Boccara (2007), the most relevant and important social divide was then between the *cona* and the *labradores*.

The 1614 testimony of a captive *cacique* gives details on the proportion of *labradores* to *cona* in 9 "areas" – although it is difficult to say if those areas correspond to *quiñelob* or *lebo* – with *labradores* per *cona* values ranging from 2:1 to 6:1, with an average of 3.3:1. This division is cited in ethnohistoric accounts until the mid-1600s; after that, *labradores* are not longer mentioned as a social category. Boccara (2003) has proposed that a key feature of prehistoric and early colonial society was warrior-prestige, with a warrior caste assuming political leadership.

At the local level, the *caserío* was headed by an *ulmen* (rich man or big man) who accumulated and gave away wealth, and intensified his own household production through possessing as many wives as he could afford. Accounts differ on whether this position was completely achieved, or were partly (or in different places) ascriptive. Many *caseríos* together formed a *quiñelob*, and many *quiñelob* a *lebo* or *rehue*. This *lebo* or *rehue* unit formed the initial autonomous political unit, but was supplanted during the colonial period by the development of larger units (the *ayllarehue*) as regional systems developed under the consolidation of paramount leaderships. Boccara (2003) proposes that such paramountcy only developed in colonial times. This is an important interpretation because it posits a clear sequence in political change during the first century of colonial contact: from achieved-status warrior/bigmen to wealth accumulating leaders that dominated staple and craft production at local and regional levels, to ascribed, regional elites dominating (after the consolidation of the frontier) warfare and trade with the Spaniards. While these uppermost levels of settlement (*lebo* or *rehue*, and *ayllarehue*) incorporated a stable political structure, hierarchy and leadership at the ordinary village level remained much more fluid, dynamic, and complex. Again, this perspective, based on close readings of historical accounts, stresses the existence of multiple axes of social leadership and differentiation.

Finally, some Araucanian scholars (Bengoa 2003; Dillehay 1990c, 2002, 2007) argue for an even more complex and formally structured political situation, with chiefs with varying levels of political power ruling at different geographical levels. In their reconstructions, chiefly power was based on a combination of political, religious, and economic processes that allowed the elite to mobilize labor, warriors, wealth, and surplus. Central to chiefly activities were the building and use of public architecture (mounds), and domination of intensified agriculture. This pattern developed before European contact, but was intensified through the relationships of warfare and trade with the Spaniards.

Although this recent scholarship represents searching and sophisticated uses of extant historical sources, it is accompanied by a number of weaknesses my current archaeological research had hoped to fill. Each of them focuses on issues an elite or ruling class, without considering patterns of social variability in the rest of society (an exception, is Boccara's discussion above distinguishing a warrior and a farmer class [1998:111-118, 286-294]). Too, the reconstructions lack a materialist perspective of use to the archaeologist (an exception to this is Dillehay's research in the Purén-Lumaco area [2007, 2010; Dillehay and Saavedra 2010] discussed below). For example, a historical account may recount a conversation with a particular chief, but it does not provide information on the nature and size of his house, or what kind of possessions he had. In this regard, I hoped my work would be a step forward in identifying the material or archaeological correlates of leadership or high status that future scholars could use in evaluating these different reconstructions in other parts of Araucania.

1.2.1 Dillehay's 2007 Monuments and Power Construct

Dillehay (2007) has presented the most important, and comprehensive, archaeologically-based discussion yet proposed for Araucanian sociopolitical dynamics, based on his study in the Purén-Lumaco area. To simplify his sophisticated and intricate argument, he proposes that central leadership and persistent inequality were based on prestige building activities, rather than wealth accumulation (2007:349). He (2007:344) argues that before the mid 1700s, "role differentiation and political specialization were more prominent that economic specialization and the display of power in elaborate wealth goods and symbols." Leadership, he observes

(2007:347), "...tended to be over people rather than land, and goods were redistributed more readily than accumulated, through feasting and bridewealth payments for as many wives as one could afford....the head ruler of lineage and multilineage grouping was not a centralizing agent or a distributor of material wealth."

Power was expressed in control over people (through rights derived from genealogical position in patrilineages), and was seen in communal ritual at mounds (that themselves marked symbolic hierarchies), gift-giving, and feasting activities. Generally, early Araucanian social leadership was corporate, in that it was associated with ceremonial display, and "communal cooperation, and action" (Dillehay 2007:347). It was through shamanic ceremonies performed at ceremonial fields and/or mounds, as well as the building of them, that leaders expressed and confirmed their power; "shamanic ceremonies and the employment of sacred knowledge and cosmological principles also were important in uniting different groups and in legitimizing rulers' power" (Dillehay 2007:347). One of the challenges of Araucania, Dillehay (2007:345) continues is that it, "undermines the generally held notion that political control by those at the social apex and coterminous accumulation of material wealth and ritual power are universal hallmarks of complex societies."

Critical to Dillehay's (2007) construct is the manner in which demographic processes underwrote political leadership. Leaders sought physically to gather followers around them, and to biologically increase the size of their own and subordinate households (Dillehay 2007:357). Ethnographic accounts record that, "the chief would do everything possible to prevent ...[village fission] ... because the greater or lesser number of clients determined his prestige" (Guevara 1925:289-91 [as quoted in Dillehay 2007:357]). Dillehay (2007:360) further observes that in the 16th-century, Araucanian leaders power lay in the ability, "to recruit non-kin from distant areas." This adoption of outsiders not only expanded chiefly households, but also resulted in the creation of larger and more aggregated chiefly communities. In sum, Dillehay's construct poses an integral connection between population nucleation, mound building, and chiefly leadership.

In Dillehay's (2007) reconstruction, the 16th century was marked by significant changes in political organization, leadership principles, and social differentiation. These changes are described as either related to Spanish contact, or to have had their origins in late prehispanic times, but to have been intensified by Spanish contact. Dillehay (2007) observes:

Competitive lineage leaders, with their intensive monopolies of recruitment and feasting, were products of the centralizing effect of increased conflict.... The archaeology ... suggests: (1) an explosive buildup of mound, feasting, domestic and defensive sites and the rise of the estado, (2) heavy population fragmentation and displacement in some areas, (3) the appearance of supra-local ayllarehue and patrilineage polities, and the eventual development of a new social order and the regional Araucanian polity between 1550 and 1650..." (Dillehay 2007:138)

Economic differentiation did not come to the fore until the late 1700s (Dillehay 2007:345).

There is nothing objectionable in Dillehay's (2007; also 1986, 1992a, 1999, 2000; Dillehay and Saavedra 2003, 2005, 2010) insightful construct, but it has some inherent limitations. One limitation is that it very much represents a "top down" perspective; in fact only a few pages of the 2007 volume are dedicated to "domestic sites." Dillehay is not unaware of variability among households, and he (2007:300) explicitly recognizes the importance of a research program studying residential patterns at the community and household levels, noting that, "although we have surveyed more than 250 domestic sites and excavated portions of several domestic sites, the plan and organization of residential communities are poorly understood at this time." So, despite the outstanding contribution represented by the Dillehay construct, what is still lacking from study of any Araucanian population is fundamental information on household differences in craft specialization, subsistence production, consumption, and ceremonial activities.

A second problem is that much of the construct is drawn from ethnohistoric information that stresses short term processes of societal change. Further, these accounts necessarily deal with the later phases of Araucanian sociopolitical evolution; archaeological investigation is required to explore the emergence and consolidation of social inequality in pre-ethnographic periods. Drawing as it does on ethnohistoric accounts, his construct focuses on power relations and leadership roles, and does little to address other potential forms of social variability and integration. In Dillehay's (2007) construct, any archaeological variability among households or communities not related to chiefly activities is explained as ethnic differences, stemming from intersite migrations of families.

Finally, as Dillehay (2007) notes, significant sociopolitical variability existed within Araucania, and great caution should be taken in extending the pattern documented in one region (in this case the Purén-Lumaco area) to other locales. Dillehay (2007:36) cautions against extrapolating his reconstruction across Araucania, noting that, "not all of these transformations occurred evenly in Araucanian territory or everywhere but only in strategic locations, which were favorable to geopolitical defense, sustainable population nucleation, and intensive agriculture, and where some local lineages were victorious and sustained long-term resistance to outsiders."

1.3 RESEARCH AT ISLA MOCHA

Araucania has emerged as an area that defies classic approaches to social complexity. The various perspectives provided by the above ethnohistorians, and the construct articulated by Dillehay (2007), highlight the importance issues of population nucleation, household status differentiation, craft production, long-distance exchange, and engagement in communal ritual should have in an archaeological research design. Each of these is amenable to study through archaeological survey. The value of the Dillehay construct is that it poses a relationship among particular processes - - population nucleation, mound building, intensive agriculture, feasting - - as central in Araucanian stratification. Therefore, comparative study in other parts of Araucania can allow us to assess whether the relationship among these processes is indeed a key to explaining Araucanian sociopolitical variability.

In addition, ethnohistoric information and limited archaeological research have focused on the issue of chiefs and their activities, and thus not been able to provide a fuller picture of the social variability within an Araucanian population. My research aimed at addressing this gap by generating: (1) archaeological data on residential patterning and socioeconomic variability at the communal and inter-settlement levels; and (2) surface study and excavation data sets for a putative Araucanian chiefly center (P31-1). This knowledge, in turn, can form the basis for a more nuanced and empirically sound reconstruction of the dynamics of inequality and political power in individual Araucanian populations.

The objective of the research was not to "test" any of the above reconstructions or constructs. Instead the goal of the research was to examine how the processes discussed in this constructs (population nucleation, agricultural intensification, etc) were manifested at the regional and household levels in the Isla Mocha population. These manifestations can then be compared to the patterns in Dillehay's construct, as well as used to assess broader theoretical models of social inequality. Among the broad research questions (these are discussed in more detail in Chapter 4) my work sought to address for the Isla Mocha population were:

(1) Was there significant household variability in wealth? Dillehay (2007) and others have argued that Araucanian social inequality was not based on, or expressed in, wealth accumulation, and that leaders were not differentially involved in wealth finance activities.

(2) How important was communal ritual and feasting in Isla Mocha social inequality? Were high status or leadership households differentially involved in ritual and feasting activities, or even spatially associated with the mounds?

(3) Given that Isla Mocha is an island, did domination of long distance trade or of ties with the mainland form a basis for higher status or political leadership?

(4) Was there significant population aggregation on Isla Mocha? If so, was aggregation around higher status or leadership households, consistent with the processes emphasized by Dillehay (2007) as critical to Araucanian political leadership? Were such households or homesteads larger than others? Is there evidence for spatial divisions in status within such population nucleations?

(5) Did such population nucleations function as centers? That is, do these sites exhibit activities or types of residents not found at other settlements in the research zone, suggesting that the sites functioned as central places?

2.0 ARAUCANIAN SETTLEMENT: ETHNOHISTORICAL AND ARCHAEOLOGICAL PERSPECTIVES

2.1 SETTING

The term “Araucania” when used to describe a territory conveys both a geographical and a cultural meaning. For this dissertation, I will consider “Araucania” as an area incorporating the basins of the Bio-Bio, Cautín-Imperial and Toltén Rivers, and including the Quiriquina, Santa María, and Mocha islands (Figure 2.1). This area of about 50,000 km^2 (260 km north-south and 190 km west-east) spreads over five geographical zones, beginning with a coastal plain that in some areas has an average width of 25 km. The coastal mountain range to the east, called the Nahuebuta Range in my zone of Chile has peaks reaching up to 1500 masl. East of this range is the Intermediate Depression or Central Valley, as it is located between two longitudinal ranges. This highland basin is delineated to the east by the piedmont, *Montaña* or *Precordillera*, with an elevation between 600 and 1000 masl. The piedmont ends at the Cordillera de los Andes, with maximum elevations of around 3000 masl.

This territory exhibits two main climate regimes: a warm temperate one with a short dry season (less than 4 months) (Csb); and a warm rainy temperate one with Mediterranean chacteristics (Cfb) (Peel et al. 2007). Average annual precipitation increases from north to south and from west to east, with values that goes from about 800-900 mm (Punta Tumbes, Isla Santa Maria, Punta Lavapie) mm to about 2000 mm (Contulmo, Lonquimay), although the average is around 1200-1300mm. The precipitation occurs throughout the year, but is concentrated in the winter months. Average annual temperature is around 12ºC, with minimums and maximums around 8º and 20º C (Hajek and Di Castri 1975).

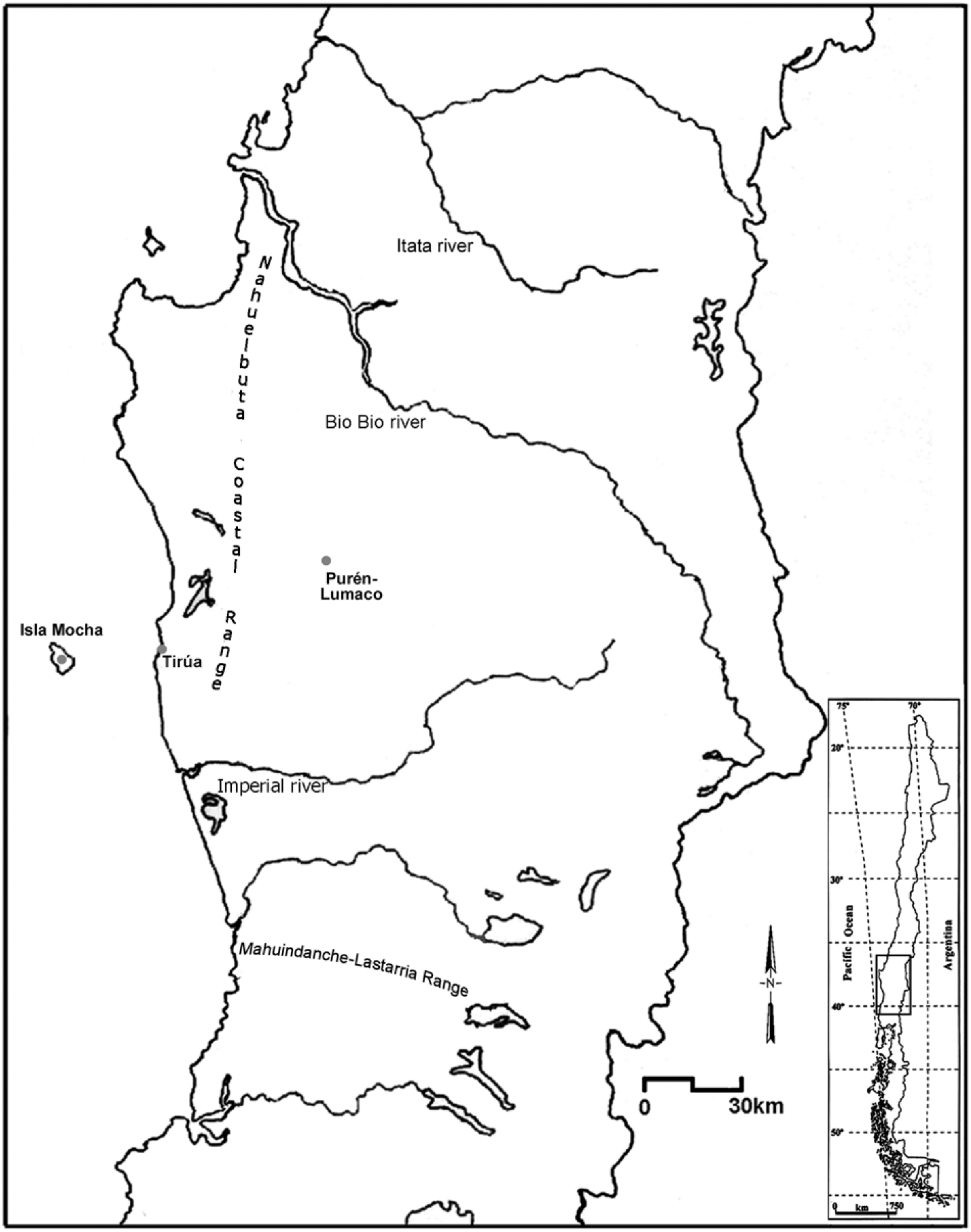

Figure 2.1 Araucania

2.2 GENERAL ARAUCANIA CHRONOLOGY

The earliest human evidence in Araucania can be dated back to the Archaic Period, with sites in the Andean Cordillera dating to around 10000 BC, about 3500 BC in the Central Valley, and 4500 BC on the coast. My research deals entirely with the Ceramic Period, with 400 AD the conventional date used for its beginning.

2.2.1 Pitren (400-1000 AD)

Throughout Araucania, following AD 400, there is widespread evidence ceramic using populations, so that this date is taken as the dividing point between the Archaic and the Early Ceramic Period. The Early Ceramic Period contains the “Pitrén Complex,” defined mostly by its ceramics (thin walls, modeled vessels, monochrome surfaces, and negative painting), and preference for direct burials in flexed positions (Adán and Mera 1997b).

These Pitrén Complex features are absent from Early Ceramic sites in the Gulf of Arauco area north of today’s city of Cañete. This situation has led to tentative definition of a different Early Ceramic period complex restricted to this area, and contemporary with the Pitrén Complex, although perhaps with a little earlier beginning.

As of yet, little can be said about the economy and social organization of Pitrén Complex populations. Most of the excavated sites correspond to funerary contexts or cemeteries. The most important information on subsistence comes mainly from Andean sites (Adán and Mera 2011) and suggests horticultural practices, gathering of wild plant resources and hunting of small animals. This pattern cannot be extrapolated to Early Ceramic Araucania as a whole.

For the Middle Cautín valley – in the Intermediate Depression, and where the Km 15-Lof Mahuida, Km 20-Licanco Chico, and Villa JMC-1 cemeteries are located - Adán and Mera (2011) have proposed a situation of social heterogeneity, with limited or no social. In contrast, for the Calafquén Lake area – in the Andean Cordillera - they propose a less socially heterogenous scenario but with higher inequality.

Based on comparison of cemetery sizes, higher population densities and larger, and more sedentary, coresidential groups seemed to have occurred in the Intermediate Depression than in the Andean cordillera. This situation seems to be clearer and stronger through time. For example, Huimpil (Gordon 1984) in the Intermediate Depression (1290±80 BP; cal. AD 657-972; Gif 4984; charcoal; δ13C = -25.0 ‰) with 10 graves, and the Andean cemeteries with no more than 4 burials (Adán and Reyes 2000), clearly contrast to later Intermediate Depression cemeteries. Km 20-Licanco Chico covers an area of 264 m^2 (1110±60 BP; cal. AD 783-1148; A-12240; δ13C = -27.3 ‰; no material provided) and Km 15-Lof Mahuida, of 480 m^2 (830±135 BP; cal. AD 995-1411; A-12241; δ13C = -27.3 ‰; no material provided) have over 20 graves each one (Ocampo et al. 2003). Meanwhile, Villa JMC-1 cemetery (1060±40 BP; cal. AD 905-1149; Beta 241265; material and δ13C provided) has over 50 graves sites (Adán and Mera 2011). Analysis of mortuary treatments has not, to date, indicated social inequality in the Pitrén Complex. Graves usually contain 5 – 7 ceramic vessels, with the 22 vessels found in a single grave in the Km 15-Lof Mahuida cemetery representing the maximum number of vessels found in a grave.

Nor is there much evidence in the Pitrén Complex for long distance trade or access to exotic goods. The few exceptions include the Km 15-Lof Mahuida and Km 20-Licanco Chico cemeteries, where small quantities of exotic lithic raw material (obsidian, silex, jasper) were recovered, and the Villa JMC-1 cemetery where small metallic artifacts and a textile fragment made of alpaca wool were found, although it is not yet known if these were locally produced or obtained from afar.

2.2.2 El Vergel (1000-1550 AD)

This study deals with the second phase for the “ceramic period:” the “El Vergel Complex.” The inception of this complex is conventionally set at around AD 1000, (except for in the Andean cordillera) and is recognized as having developed out of the Pitrén Complex.

A number of changes in ceramic decorative preferences mark the El Vergel, including use of red or black slips, and the characteristic use of painted red and/or black geometric motifs over white surfaces. El Vergel ceramics are often coarser than those of the Pitren Complex, and the El Vergel saw the introduction of larger vessels. Despite these differences, there is great continuity in vessels shapes, and in the appearance and manufacturing techniques of plainware and domestic pottery, making it almost impossible to distinguish the complexes’ pottery from one another at the individual or small assemblage level. The El Vergel Complex is also associated with the emergence of metallurgy, and production of characteristic metal items of adornment.

Another change of the El Vergel Complex includes a diversification of burial practices marked by the contemporaneous usage of ceramic urn, hollowed tree trunk, stone cists, and direct internment burials (but now in extended position), and by the appearance of the famous Mapuche funerary mounds. In some cases, tombs of these different types occur in the same cemetery and grave.

There is tentative agreement that population levels rose throughout Araucania during the El Vergel time, with greater use of cultigens, although wild resources remained very important. The research by Massone et al. (2008) has provided evidence of the consumption in Isla Santa Maria of *Chenopodium quinoa*, (quinoa) and probably *Phaseoulus* sp. (beans), and of wild species such as *Fragaria chiloensis* (Chilean strawberry), *Typha angustifolia* (narrowleaf cattail), *Cyperus* sp. (sedges), *Cryptocarya alba* (peumo), and *Muehlenbeckia hastulata* (quilo).

At El Arenal (Contreras et al 2005), recovered crop remains include quinoa and maize, and wild species such as peumo, *Rubus* sp. (berries), and *Typha angustifolia*. The faunal assemblage included fishes (especially, *Trachurus symmetricus* [Chilean jack mackerel]), camelids, canids (*Lycalopex griseus* [South American gray fox]), rodents (*Myocastor coipus* [nutria]), and *cetaceans.* Plant foods represented at the Ca-17 site included *Aristotelia chilensis* (Chilean wineberry), *Rubus* sp. (berries), *Muehlenbeckia hastulata*, and *Typha angustifolia* (Silva 2010).

The socioeconomic organization of the El Vergel Complex populations remains largely unexplored, particularly in terms of information generated by archaeology, rather than ethnohistory. Because this was the "archaeological culture" encountered by the European arrival in Araucania at the middle of the 16th century, archaeologists have tended to mine the "eye-witness" ethnohistoric accounts and the work of historians. Given the existence of a non-subdued and native Araucania until the late 19th century, and the extreme reluctance of the natives to permit archaeological research in the 20th century, it is not surprising that researchers have relied on ethnographic studies to reconstruct the prehistoric and early historic sociopolitical organization.

In addition to the work of Dillehay, the most important archaeological studies of the El Vergel Complex can be easily cited: Adán and Mera (1997a), Adán et al (2005); Aldunate (1989); Bahamondes (2009); Bullock (1955, 1970); Bustos (1985); Castro and Adán (2001); Dillehay (1981, 1986, 1990a, 1990d, 1992b, 1999, 2007); Dillehay and Gordon (1988); Gordon

(1978, 1991, 1992-95); Gordon et al. (1972-73); Latcham (1928a, 1928b); Massone (2005); Medina (1852); Menghin (1962); Navarro and Aldunate (2002); Ocampo et al. (2005); Quiroz (2003a); Quiroz and Sánchez (1997, 2005); Sánchez and Bustos (1984); Sánchez et al (2004); Seguel (2003); Stehberg (1980); and Valdés et al. (1985).

Of these, only a handful have contributed archaeological evidence to discussion of native economic and social organization, the most notable being the works by Dillehay in the Puren-Lumaco valley (2007), by Massone on Isla Santa María, by Quiroz and Contreras at the El Arenal site, and by Quiroz and Sánchez in Ca-17 and in Isla Mocha. Of these, Dillehay (2007) has been the most inclined to treat native political structure and principles. Put broadly, he has proposed that the El Vergel Complex in the Puren-Lumaco region was characterized, at least in its earlier centuries, by simple chiefdoms associated with mound-building activities and with agricultural intensification (as seen in canals, terraces, and raised fields). He (2007) explicitly leaves open the door for different political trajectories and outcomes in other regions of Araucania.

2.2.3 reche-Mapuche (1550-1882 AD)

The "end" for the El Vergel Complex is arbitrarily set at AD 1550, the year in which the Spaniards started their campaign to conquer Araucania. The El Vergel Complex did not disappear immediately, of course, but the sociopolitical processes set in motion by Spanish pressure, as well as the rich set of ethnohistoric sources dealing with the Araucanian population, make that date a significant milestone in archaeological study of Araucania. As noted in Chapter 1, Dillehay (2007) in his archaeological study in the Puren-Lumaco valley has related the historical increase in mound-building to the development of a more powerful paramount chiefdoms, and a shift from leadership based to prestige to leadership based on wealth accumulation, as resulting from interaction with the Spanish. Boccara has also proposed that European contact fostered increased native political centralization and regional integration, with regional leaders curtailing the previous autonomy of localized social units.

From the earliest ethnohistoric sources, it is clear that all people in 1550 AD Araucania were part of a shared cultural background, represented by a common language (Mapudungun) and religious beliefs, and united in an ability to articulate very effective –and in some cases, long enduring - local, regional, and macro-regional alliances.

I have preferred the term “reche-Mapuche” to refer to the native people that inhabited Araucania following AD 1550, dismissing other terms as “Araucanians” or simply “Mapuche”. This decision, following Boccara (2007), is based on the absence of a regional native ethnonym or endonym to refer to the entire population of Araucania at the moment of European arrival. In this context “reche” (re: authentic, pure, true; che: people, individual, in Mapudungun) emerges as the best and only viable concept to name this population as a whole. Although “reche” has to be considered just as a regional deictic (Menard 2010) – for this reason I am using it without a capital letter-, which is replaced since around AD 1750 onwards by a true endonym in the word “Mapuche”, which is the name used by the native people of Araucania to refer to themselves up through today.

Beginning in the 1550s, the Spaniards planted a series of villages and forts in Araucania as part of their conquest. Spanish control was thwarted by several native uprisings and Araucania was never subdued by the Spanish. The most successful and large scale of these uprisings was the one that started in 1598, after the killing of the *Gobernador*. This uprising lasted until 1604, and led to the total destruction and abandonment of all the Spanish villages and forts south of the Bio-Bio River, abruptly ending Spanish domination of Araucania. The revolt set the stage for the recognition of a native independent territory between the Bio-Bio and Toltén rivers; one even recognized by the Spanish Crown through a treaty signed in 1641. Reche-Mapuche independence created conditions for an active frontier trade between Europeans and natives, and was maintained by massive parleys any time a situation demanded them. This Araucanian free state persisted until 1882. In that year, the so-called *Pacificación de la Araucanía* campaign (1850s-1882) finally overcame the last areas of native resistance. In this way, this territory, through the use of the Chilean Army, was incorporated into the Republic of Chile.

The socioeconomic organization of the reche-Mapuche period has been studied largely with historical sources, and an archaeological picture of this period, particularly the dynamics of culture contact at the communal and household levels, can barely be sketched (again, the work of Dillehay [2007] constitutes the important exception). One of the better documented consequences of European arrival was a significant and dramatic native population decline. For Araucanía as a whole, Bengoa (2003) has estimated a prehistoric population of 500,000 in 1550, which dropped to 100,000 people by 1600. The native population remained at this level until the incorporation of Araucanía into republican Chile in 1882. Archaeologically, the known “horizon markers” for the beginning of the reche-Mapuche include the disappearance of the urn burial type, the replacement of native metal objects by European silver (although silver has not been found in mortuary contexts), and the incorporation into native subsistence of European domesticates (horses, cattle, sheep, wheat, barley, and apples).

2.3 ARAUCANIAN REGIONAL, COMMUNAL, AND HOUSEHOLD PATTERNS

In preparing for my field research, I investigated ways in which existing knowledge (from ethnohistoric and archaeological sources) of prehispanic/early historic Araucanian settlement patterns might be useful as analogues in studying settlement on Isla Mocha.

2.3.1 Ethnohistoric Perspectives

I found that ethnohistorical information on Araucanian socio-spatial organization in the 16th or 17th centuries was limited and idealized. The most refined and comprehensive synthesis has been put forward by Boccara (2007), based solely on his analysis of ethnohistoric sources. His (2007) reconstruction has to be considered as more amenable to the post-1600 AD era, and we should not have great confidence in its applicability to before 1600 AD.

Boccara (2007) proposes a nested hierarchy of six organizational levels. This is represented in Figure 2.2, at the right side appears the leadership figure for each level.

- the *ruca*: the domestic unit. It was inhabited by an extended polygamous family. According to Boccara, the *ruca* was constituted by the husband, his wife(s), and single daughters and sons. In some cases, married sons also lived in the father's house, particularly the older son who usually inherited the father's titles and roles. The number of wives reflected the social status of the male head of household.

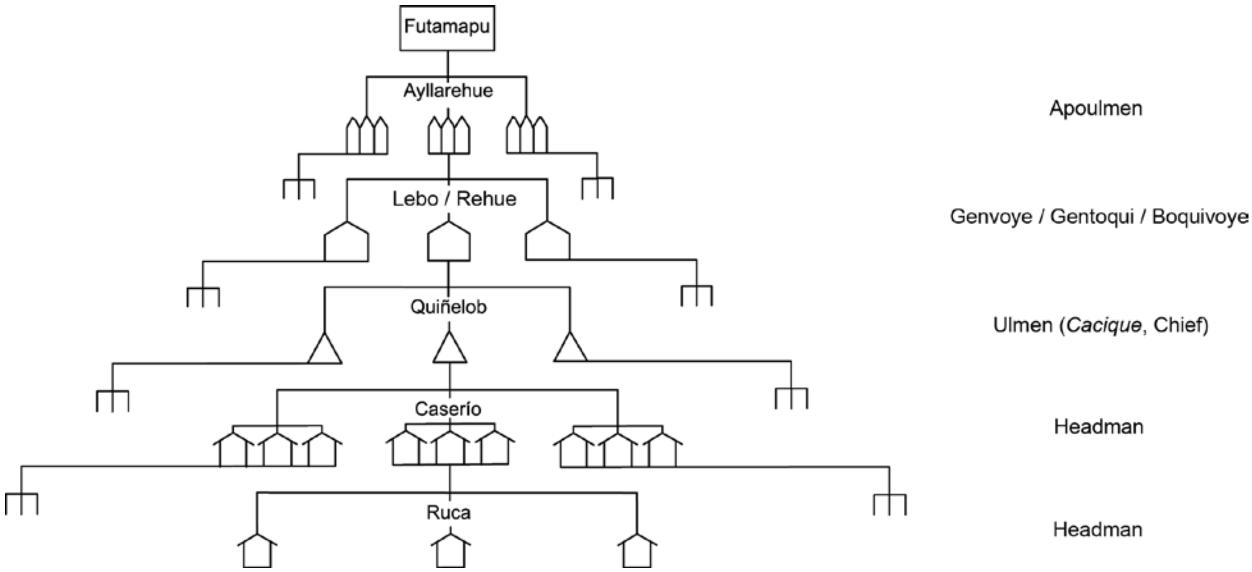

Figure 2.2 Hierarchy of organizational levels, since Boccara (2007)

- the *caserío*: a spatial congregation of several *ruca*. All the male members belonged to the same patrifamily, the one of the main *cacique* called *ulmen*, although some affine (brothers-in-law and sons-in-law) could reside here also. This unit collectively performed periodic production tasks. Boccara's (2003:43-51) information on the *caserío* derives almost exclusively from Núñez de Pineda´s account (1863). This Spanish soldier lived in and traversed Araucanía (from north of the Bio-Bio River to the Imperial River) as a captive from May to November 1629, and had a rare view of native activities during the winter (most first-hand accounts by the Spanish were made during the summer).

Núñez de Pineda indicated that the *caseríos* he observed were formed by a dispersed set of 4 to 9 *ruca*. The distances between the *ruca* making up a *caserío* ranged from 100 - 200 m (1 to 2 *cuadras*) to as much as 400 - 500 m (5 *cuadras*). He further also suggests distances between different *caseríos* as ranging from between 1 (*un cuarto de legua*) and 8 km (*2 leguas*). If an average size of a domestic unit is five people, one could expect a population between 20 - 45 people per *caserío*. Yet if one were to draw an "ideal" *caserío* with one *ruca* at its center and surrounded by another 6 equidistant *ruca*, it is clear from de Pineda's figures that the area of the *caserío* could be as small as 3.5 ha (3,500 m^2) when *ruca* are spaced at 100m, or as large as 80 ha (80,000 m^2) *ruca* are spaced at 500 m. Figure 2.3 depicts this situation, with the inner circle corresponding to the first scenario, and the outer circle to the second case.

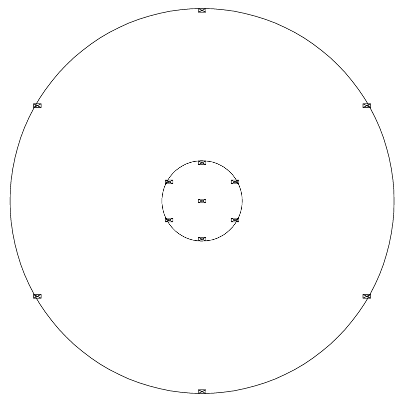

Figure 2.3 Two scenarios for an "ideal" *caserío*

It is not known whether the pattern described by de Pineda was found throughout Araucanía. It should also be kept in mind that native settlement patterns (and certainly settlement densities) would have been sharply affected by the dramatic population drop in the 1550-1600 period, following European arrival. As noted earlier, Bengoa (2003) has calculated the population in the area between the Bio-Bio and Toltén rivers to have been 500,000 people in 1550, but by 1660, to have dropped to around 100,000 people. In fact, through the chronicles, it is possible to notice a change in how the human occupation of the territory is described. The earliest chronicles (Valdivia, Bibar, Mariño de Lobera) indicate the existence of large human concentrations, with a high population density, throughout Araucania. Even Bibar and Mariño de Lobera, whose observations cover a longer period than Valdivia, makes note of the evident population drop. Ethnohistoric accounts post-dating about AD 1600 (as Ocaña's and González de Nájera's accounts), no longer talk about dense and populous towns, but instead emphasize the presence of dispersed settlements formed by small numbers of dwellings. Significantly, perhaps, the only exception to this pattern is the "ciénaga de Purén" region, that is, Dillehay's (2007) primary archaeological research area. The description of a dispersed and small population is reiterated in all the sources until the *Pacificación* time of the late 19th century. Indeed, the population between the Bio-Bio and Toltén rivers continues to be estimated at 100,000 into the late 19th century.

- the *quiñelob*: an endogomous group formed by several patrifamilies and made up of several *caserios*. Boccara (2003) calls this supra-local unit the “base community,” because it was within this unit that individuals were married and collaborated in productive activities. In addition, members of the group organized the defense of its territory, and performed communal funerary rituals.

The size and population of a *quiñelob* cannot be estimated from the ethnohistoric sources. However considering the hypothetical size of a *caserio*, the *quiñelob* population should have numbered at least in the hundreds. According to Boccara’s reading of the sources, the *quiñelob* acted as the, “first autonomous political level in the reche social structure.” It was headed by a chief or cacique called *ulmen* (the “reche cacique” in Boccara’s terms). The power of this chief was associated with the number of relatives he congregated around him, and his wealth was reflected in the number of his wives and sponsored feasts. To this, I can add that an *ulmen* (or *quiñelob* leader) was also quite likely the headman of his own *caserío*, but obviously not all the *caserío* headmen were *ulmen* or *quiñelob* leaders.

- the *lebo*: an autonomous sociopolitical unit formed by several *quiñelob*, with a population that can be estimated, following the chronicles, as numbering in the thousands. There is little specific information on the nature of the relationships that bound individual *quiñelob* into a *lebo*, other than that of chiefly relationships. Boccara (2007:100) refers to an occasion in which the natives made peace with the Spaniards. Each *lebo* was then represented not by a single *cacique* but by several of them, although just one of them was in charge of communicating the decisions. Although Boccara does not explore this possibility, the *quiñelob*’s autonomy suggests at least the potential for it to change its affiliation from one *lebo* to another.

The ceremonial space of a *lebo* was called a *rehue*, and this term is often used interchangeably with that of *lebo* (Zavala and Dillehay 2010). The importance of the *lebo* in social affiliation is indicated by the fact that the membership in it defines a clear line between “Us” and “Them”, to the point that it was prohibited to sacrifice, decapitate, (or eat) anybody of the same *lebo*. At the level of the *lebo* would be taken the decisions concerning internal and external politics (alliances, war, justice), as well as those related to religious and community gatherings. These decisions rested with three types of political figures, *primus inter pares*, drawn from the leadership of the constituent *quiñelob*: a civil or peace times leader called *Genvoye*, a military leader called *Gentoqui*, and a religious leader called *Boquivoye*. Other *ulmen*, representing constituent *quiñelob*, did not entirely lack political power at this level, and functioned as an advisory council.

While the implication of the ethnohistoric accounts is that the *lebo* was a territorial unit, the extent to which the larger sociopolitical units below also constituted territorial units is not clear.

- the *ayllarehue*: social unit formed theoretically by nine *lebo* or *rehue*. In the 16th century, these units came into being only in times of war times, but since the 18th century, they have became a permanent political aggregate headed by an *apoulmen*.

- the *futamapu*: macro-regional political district formed by several *ayllarehue*. This configuration was institutionalized in the 18th century.

2.3.2 The Araucanian Household: Ethnographic Fragments

Ethnohistoric chronicles provide fragmentary but useful information on pre-19th century Araucanian dwellings and household life (Campbell 2009), and can be mined to generate a sketch of the normative pre- and proto- historic Araucanian "household unit."

From AD 1550 to the end of the 19th century, the *ruca* is described in rather similar terms, as an oval to rectangular house, with high walls made of canes and thatch, and without windows. The size of the individual dwelling however, is difficult to grasp from the early ethnohistoric sources. These sources are not in agreement, while generally be relating house size to the size of the family and/or the importance of the family leader. Most of the sources that provide house measurements date to the post-18th century period. The Table 2.1 and figures 2.4, 2.5, 2.6, and 2.7.

One of the earliest descriptions, that of Mariño de Lobera (1595), provides a difficult to reconstruct measure that might be interpreted either as a perimeter or as an area. Therefore, I created 4 correlations -two for each domestic unit he describes- one considering the hypothetical area and the other, the hypothetical perimeter. González de Najera (1614) mentions the existence of small, medium, and large houses, and the one he detailed is the upper limit size – according to him – for an important individual's house. On the other hand, Smith (1853) in giving house sizes also includes its adjacent *ramada* (in the Table 2.1 the house plus the *ramada* measurement corresponds to the value in parenthesis, and in Figures 2.4, 2.5, and 2.6 to the two triangles joined by a line). Finally, Ruiz Aldea (1870) only reported the *ruca* length. All the inferred and complementary measurements are in italics.

Table 2.1 Ethnohistoric and ethnographic household measurements

Source	Length (in m)	Width (in m)	Area (in m^2)	Perimeter (in m)	Description
Mariño de Lobera, 1595			32		"they are very large, of 400 feet in square each one, and some measure more, and still there are no few of 800 feet (…) Each indian of these had many women, and so there was in each house 14 or 15 , or more doors in order to each woman had her own door"
	53	*3*	*159*	112	
	28	*28*	*784*	112	
			64		
	109	*3*	*327*	224	
	56	*56*	*3136*	224	
González de Nájera, 1614	28	8.4	235		"the largest one of an important indian is no larger than …"
Domeyko, 1845	16.6	6.6	110		
	16.6	8.3	138		
Smith, 1853	9	4.5	41		
	24	9 (30)	216 (720)		
	42	9	378		
Ruiz Aldea, 1870	8.3	*3*	*25*		
	16.6	*3*	*50*		
	8.3	*10*	*83*		
	16.6	*10*	*166*		
Joseph, 1920	12	7	84		"the larger ones measure from 12m to 15 m of length and 7m to 10m of width"
	15	10	150		
Housse, 1940	15	10	150		"the larger ones measure 15 meters of length by 10 of width and 6 of height, although I have seen no few that do not surpass 5 meters by 3, and in which were crowded up to a dozen of natives"
	5	3	15		
Titev, 1951	7.6	4.6	35		"The rukas are generally oval or rectangular in ground plan, and average about 15 feet wide, 25 to 30 feet long, and 8 to 10 feet high"
	9.1	4.6	42		

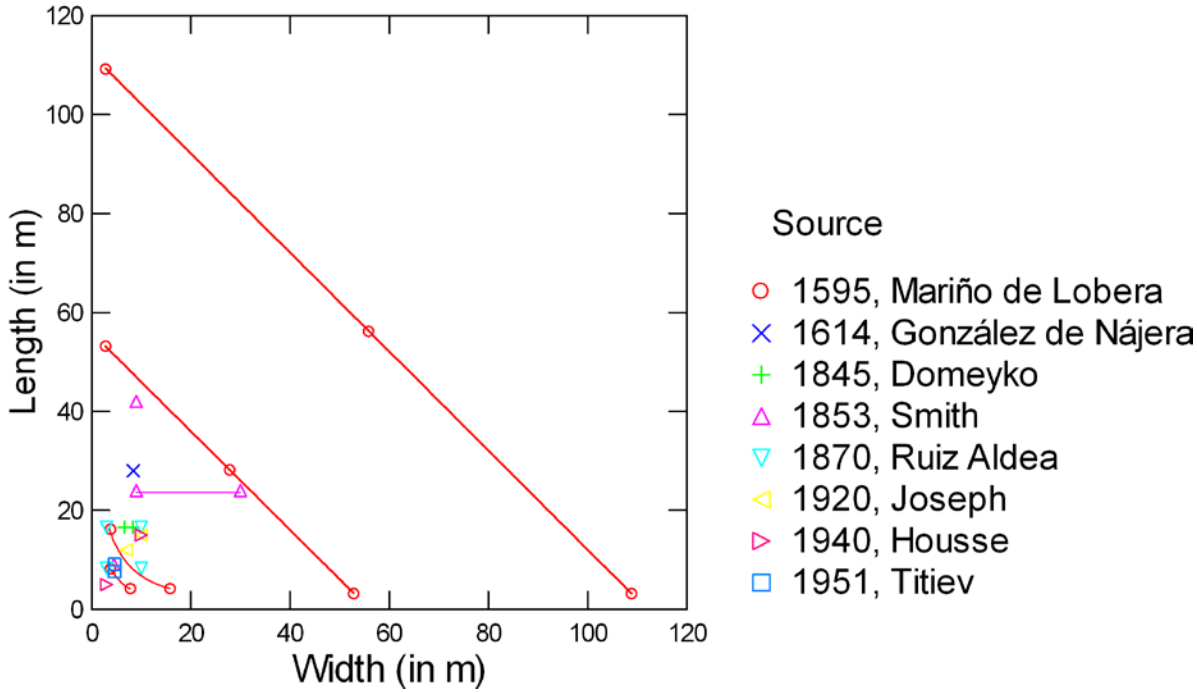

Figure 2.4 Households lengths and widths compared

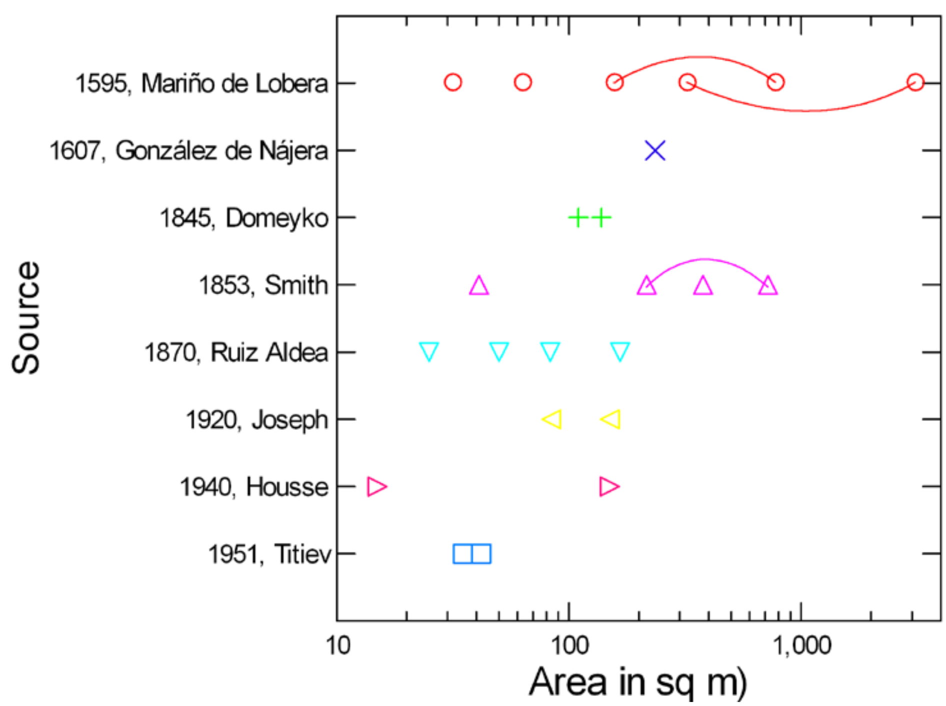

Figure 2.5 Households areas compared

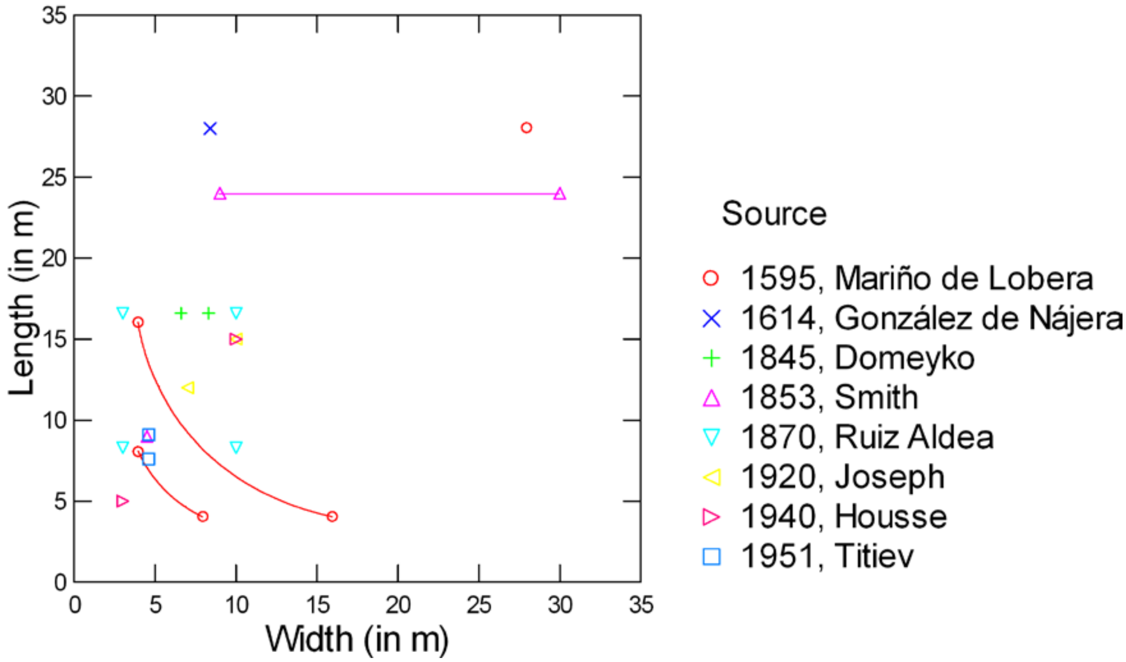

Figure 2.6 Close-up on households lengths and widths compared

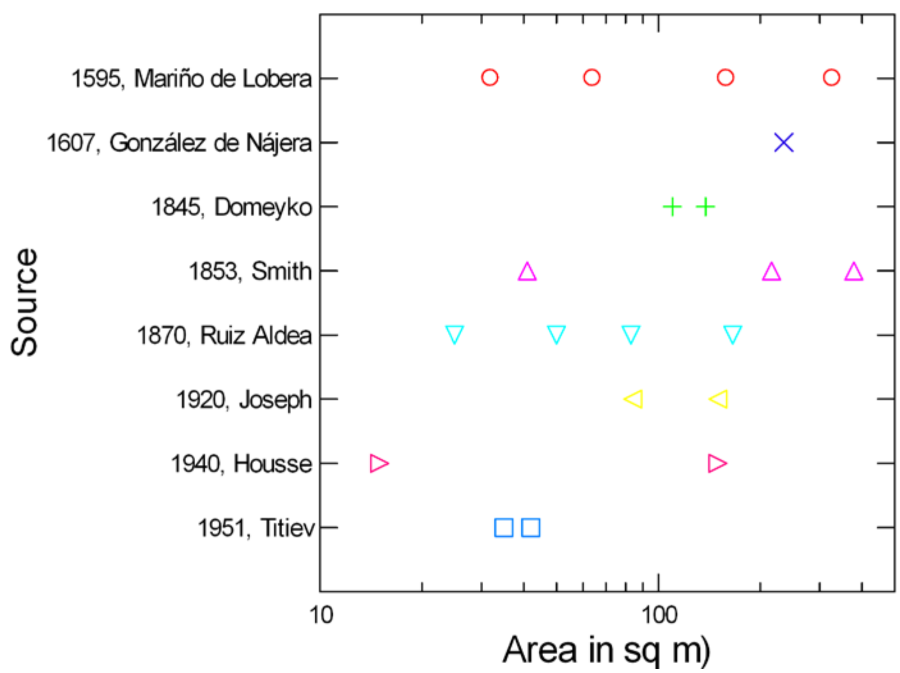

Figure 2.7 Close-up on households areas compared

Even leaving outside potential regional and chronological variability, the most significant aspect of these figures is that nearly all are well above the average 20 – 25 square meter threshold typical for housing a nuclear family. Thus, these figures suggest a stem or extended family household. If Narroll's figure (1962) of one person per 10 square meters is considered, the values given are mostly reasonable, particularly as his index is now generally recognized to understate household size. The reported sizes would range from below that of a nuclear family (Housse 1940) to as high as 38 individuals (Smith 1853).

Taking into consideration 17th century information from Isla Mocha (the depopulation census, to which I will refer in more detail later) and assuming each family to correspond to a co-residential unit, we can estimate the hypothetical size of the domestic units to range up to 160 m^2, with a mean of around 50 m^2. These values are consistent with the information from the ethnohistoric sources.

The internal configuration of houses is not well described in the ethnohistoric accounts, although most of the early sources indicate the absence of any furniture or internal dividing walls. This situation began to change near the end of the 18th century, and from the early 1800s on, sources describe a tripartite organization: a storage area at the rear, the hearth or hearths in the center, and rooms at the sides or corners.

Hearths are commonly described as being located at the center of the dwelling, although external hearths are also mentioned. Some sources indicate that each wife would have had her own hearth (Smith [1853.] mentions a house with up to 6 simultaneous hearths), but if the family contains many wives, hearths were shared. This latter case seems to be the situation of Anganamón – a very powerful cacique from Purén with "many wives" – who according to Núñez de Pineda (1629) had three hearths in his house.

Household storage of food (mostly grain) is also mentioned in early documents. These describe storage areas located underground within the houses (Góngora Marmolejo 1850:76), supplies are "hidden in silos and caves" (Mariño de Lobera 1865:214), and even "buried in hidden silos" (González de Nájera 1614:177). When food storage is next mentioned, from mid-19th century sources, it is located at the rear of the dwelling. Later sources also indicate the common practice of storing household materials (food, cradles, bags, wooden objects) in the roof beams or on house walls.

In general, most of the chronicles are in agreement in describing the polygamous character of the society, and the existence of multi-family domestic units. As is common in polygamous societies, females in the household were the economic engine of the family, and marked the economic or social status of the family leader. Among the female activities mentioned prominently in ethnohistoric sources are agricultural labor in the fields, making and serving chicha, spinning and weaving, gathering firewood and water, food preparation, sweeping, grinding grains, making pottery and baskets, shearing wool-bearing animals, and taking care of children and horses. Typically, male activities were glossed as: play, parley, barter, receiving visitors and foreigners, wood- and silver-working, and occasionally plowing fields.

2.3.3 Archaeological Perspective

Put bluntly, there is currently only one proper archaeological settlement pattern study for Araucania - that of Dillehay (2007) – with its attendant strengths and weaknesses. A handful of other projects have involved some level of survey, and while these might provide a good baseline for future study, they have largely been limited in scale and data generation, superficial and descriptive, or done in such a way that they provide little more information than dots on a map. For the Araucanian coast and islands, there are surveys for Isla Mocha (Quiroz 2003, Quiroz and Sánchez 1997), Isla Santa Maria (Massone 2005, Massone et al. 2002), Isla Quiriquina (Seguel 1970; Bustos 1985), the Arauco Gulf (Seguel 2003), and the Lebu coast (Sánchez 1979; Sánchez and Bustos 1984). For the territory between the coast and the Nahuelbuta Range, the “Catastro patrimonio arqueológico Mapuche, Provincia de Arauco” (Quiroz 2003, see also Quiroz 2010) provides estimable new data. The *Catastro* also compiles the information already available for the 5 areas initially mention.

In the Intermediate Depression region, with the exception of Dillehay's research, there has been no further survey at all. For the Andean piedmont and cordillera, surveys have been conducted for the Villarrica-Lanin and Lonquimay-Llaima areas (Munita et al. 2010). South of the Toltén river basin - beyond what I have defined as Araucania - Adán et al. (2007) compile data for the entire Valdivia river basin.

2.3.3.1 The Purén-Lumaco Valley Overall, Dillehay’s work (1986, 1992, 1999a, 1999b, 2005, 2007) in the Purén-Lumaco Valley currently constitutes the best archaeological window on Araucanian settlement patterns. In this valley, he implemented a 100% survey coverage over an area of about 250 km^2 (my estimation because he does not provide the size of the surveyed area). Survey recorded, "380 pre-Hispanic and Hispanic localities to date, including residential, agricultural, defensive, cemetery, and mound (*kuel*) sites of different types and scales” (Dillehay

2007:276). However, in another source (Dillehay and Saavedra 2010:9) the number of archaeological sites is estimated to be about 500. The Valley contains more than 300 mounds, 78 of them clustered in 9 - 11 mound complexes. Another 70 sites correspond to cemeteries, fortresses, or agricultural facilities (channels, terraces, and raised fields). Some of the fortresses (Dillehay 2007:303) may correspond to the Late Prehispanic period, but most of them are of an early Hispanic origin. Following agreements between Dillehay and the Mapuche communities, the investigators do not provide detailed information about cemeteries or burials.

This leaves some 144 domestic sites (although the number of 250 such sites is also mentioned; Dillehay 2007:300). At some domestic sites judgmental surface collections of diagnostic sherds were performed. Excavations were carried out at 17 mounds and domestic sites (Dillehay 2010:11). A total of 13,519 sherds were recovered in these excavations, but only one whole vessel. Sherds were predominantly from plainware or serving wares.

The test pits revealed some domestic sites to have an occupational stratigraphy of 40 to 90 cm deep. The 14C dates set them from 5150 BC to AD 1850. Domestic sites are described as being, "distributed more or less evenly on the lower hill slopes and occasionally on low ridge spurs just above the valley floor, especially near wetlands, and below *rehuekuel*" (Dillehay and Saavedra 2010:300). An interesting point made by the investigators is that "there does not seem to be evidence for any obvious community plans at non-mound sites, although postholes and open areas suggest houses (*rucas*) dispersed across areas located just above wetlands in the valley floor" (Dillehay and Saavedra 2010:300).

The mounds range in size from 5 - 40 m in diameter, and 1 - 18 m in height. They date from at least the 12th century onwards, although most of them were constructed during the Late Prehispanic and Early Hispanic periods. Mounds functioned as chiefly funerary places, as well as public ritual and political gathering spaces.

Dillehay (2007:30) provides details about the different types of domestic sites located in the Valley. He indicates that, “undifferentiated habitation sites of the late El Vergel (ca 1200-1500), particularly of the early historic period range in size between 25 and 50 ha and contain deposits averaging between 20 and 50 cm in thickness,” and that these sites are roughly three times greater in size than those of the earlier Pitrén period. He found that sites dated between 1500 and 1750, were somewhat smaller, with a “range in size between 3 and 15 ha, contain[ing] deposits extending in thickness between 30 and 80 cm.”

Dillehay (2007:304) calculates that, “small communities would consist of settlements that have an area between 4 and 17 ha and moderately sized villages would have an area between 18 and 35 ha.” Meanwhile the, “large *rehuekuel* complexes accommodate between 2 and 80 ha, providing that they also have the associated domestic sites." *Rehuekuel* is a complex with two or more mounds or *kuel* (in Mapudungun). Based on these figures, Dillehay (2007:304) estimates, "that small to large domestic sites may have been occupied by as few as 25 to 40 persons and by as many as 2,000 to 3,000 persons, respectively." Earlier in the volume Dillehay (2007:282) states that, "each *rehuekuel* occupies between 1 and 10 ha, with adjacent village and cemetery zones often spread over an additional 10 to 25 ha," but he does not provide a population estimate for this situation.

Dillehay (2007:311) notes that in late pre-hispanic times "a chiefly patrilineage territory" would have covered an area of approximately 25 sq km, with an estimated population of 1500 to 3000 people. He adds that during the 1600-1800 AD period, "the larger patrilineage polity in the [V]alley covered about 150 sq km and probably comprised about 6,000 to 10,000 people."

Based on what was observed in his field survey, Dillehay (2007:235) describes the Araucanian settlement patterns in south-central Chile generally as thus consisting of, "decentralized settlement of dispersed households occupied by kin-based groups of chiefs and commoners," while noting that there is no single pattern, with, in some areas, more nucleated settlement developing around, "mound-building, incipient agriculture, public ritual, and partly centralized leadership in rich and geographically circumscribed valleys..." (Dillehay 2007:138).

2.3.3.2 Archaeological Evidence for Araucanian Social Differentiation While the ethnohistoric accounts can be used to generate a picture of a complex chiefly hierarchy and strong social divisions in Araucanian populations, as of yet there have been no archaeological studies exploring social differentiation. Notably lacking is the type of investigation of domestic contexts or assemblages needed to discern household wealth, status, or occupational differences. The only significant systematic excavations of domestic contexts at all have been a handful of test pits in residential sites in the Purén-Lumaco Valley (described below), and these have not aimed at documenting inter-household variability.

This leaves mortuary remains as the other line of evidence for reconstructing social differences. While the number of archaeologically investigated mortuary contexts is very low, the tentative picture that can be drawn from the existing burial information is that there were not marked wealth differences in burial treatment at all, save (perhaps) for those chiefs interred in mounds.

Differential mortuary treatments may express some type of social distinction in late prehispanic and early historic (El Vergel Complex) times. Burial types ranged from urn burials and direct extended inhumations, to burial in hollowed tree trunks or stone cist tombs, to placement in funerary mounds. In some cases, these burial treatments coexisted in the same cemetery. Urn burial was the most widespread prehistoric practice, almost a trademark for the El Vergel period, but it seems to disappear shortly following European arrival. Burial in hollowed tree trunks and funerary mounds continued to be used up to the late 19th century, although these treatments were reserved for chiefs and other important figures. Ethnohistoric accounts also mention the burial place as chiefs as including the fields where feasts, rituals, and *palin* matches (a sort of native hockey) were held.

Not much information is provided about the mound burials by Dillehay (2007). As he (2007:280-281) states,"I [Dillehay] have been asked by Mapuche communities not to expose the human remains of ancestors. The Purén-Lumaco Project that I direct in the study area also has respectfully honored this request. Mapuche communities have granted us permission to expose only the top layer of burial chambers just to record their depth and size. It is for these reasons that no burials are discussed below." Therefore, we do know for certain what category of individual, or how many of them, or what kinds of grave goods, were placed in the mounds. Indeed, the interpretation of mounds as funerary spaces, and in particular, as chiefly burial places, is mostly based on *machi* (shaman) accounts collected by Dillehay.

In turning to the excavations of graves that have been recorded, none describe what could be called a "fancy" or "wealthy" burial. The closest thing known to a "rich" Araucanian burial is one that was accompanied by a monochrome urn that contained 2 silver earrings and more than a hundred glass beads (thus dating it very probably to Early Historic times) (Campbell 2004). The known examples of painted red-over-white urn burials number no more than ten (Bullock 1955, 1970; Adán and Mera 1997; Adán et al 2007), and none contained significant grave goods. The burial recorded with the highest collection of metal items - a direct burial found in the Angol area, yielded a mere five metal earrings (Bullock 1970). Even beads do not occur in great numbers in any single burial, rarely surpassing 20 beads per burial, and currently there are only 15 burials with beads reported for all of Araucania. For example, a direct burial at the Bio-Bio river mouth yielded 18 shells beads, a combined urn-hollowed trunk burial at Padre Las Casas –Middle Cautín valley- yielded no more than five stone beads (Gordon 1978), and a direct burial at P21-1 (on Isla Mocha) yielded only two glass beads (Sánchez 1997). Finally, the largest number of vessels found in a single grave is five in a cist burial at Ralipitra –Lower Cautín valley- (Valdés et al. 1985); most burials contain between none and two vessels. Of course, environmental conditions prevent in almost all cases the preservation of organic items such as textiles or wood artifacts.

Even so however, there is no evidence for marked material variability or wealth differentiation among the collection of graves excavated in Araucania. The only known "special treatment" given to a subsection of the population is burial in a mound.

2.3.3.3 Communal and Household Archaeological Studies There has so been little archaeological investigation of Araucanian communal and domestic patterns that it can be summarized quite briefly.

The "Km 0-Enlace Temuco" site is located near Temuco, in the Middle Cautín valley. Here, excavation of an area of about $120m^2$, as part of a CRM project, revealed an El Vergel mono-component domestic occupation dating to roughly 505±65 BP (cal. AD 1322-1624; no code and δ13C provided; charcoal), or late prehistoric-early historic times. Excavation revealed a floor at roughly 30 cm deep, delineated by an arrangement of post holes, with interior hearths, charcoal stains, and large ceramic fragments, and outside refuse remains. Domestic materials included ceramics, lithics, and metal artifacts. The extant ceramic analysis did not discriminate between the inside and outside areas, and involved a 50% sample (n=2198) of the total recovered pottery fragments (n=4339). This analysis revealed a marked predominance of the monochrome ceramic wares (75.57%, n=1662), followed by slipped fragments (17.8%, n=391), slipped and painted fragments (6%, n=131), and, finally painted without slip fragments (0.63%, n=14). Also recovered was a ceramic pipe fragment. Among the 806 stone artifacts recovered were complete and broken grinding stones, an axe, scrapers, flakes and blades, knives, and a projectile point. The raw materials reported are basalt, quartz, chalcedony, fossilized wood, obsidian, pumice, and lava. A notched, quadrangular copper earring was also recovered. Despite the domestic context, no faunal remains were found.

The only substantive archaeological discussion of Araucanian community and domestic patterns is provided by Dillehay (2007), based on his work in the Purén-Lumaco Valley. His treatment of the Purén-Lumaco evidence (1986, 1992, 1999a, 1999b, 2005, 2007) contains only passing references to household variability, and his interpretations are not based on systematic investigation of domestic contexts

Despite the information his own research has generated, Dillehay (2007:278) notes "that the plan and organization of residential communities are poorly understood at this time," and, "there does not seem to be evidence for any obvious community plans at non-mound sites." Dillehay (2007:278) suggests that the processes by which intact domestic lineages recruited outside members to their homeland site created a “co-residence” of different population sectors.” His (2007:278) own work indicates that “intracommunity spatial patterning...a variety of local and nonlocal ceramic wares...suggests the co-residence of different population sectors.”

About the archaeologically excavated domestic contexts, he (2007) observes that they, “consist principally of hearths, ceramic concentrations, and fire pits and ovens.” His project did not excavate a complete dwelling or household unit, so his reconstruction of the basic residential unit – the homestead – is based on ethnographic analogy. Using estimates drawn from ethnographic, ethnoarchaeological, and archaeological evidence, he (2007:304) proposes, “that a family would include homesteads of ½ ha or less.” That homestead would consist of a house lot or *ruca* housing seven people.

2.4 ETHNOHISTORY

Ethnohistoric sources (Spanish, English, and Dutch) concerning Isla Mocha provide significant information on the diet, the ties to the mainland population, the demography and the social organization of the native inhabitants. These sources cover about 140 years (roughly one-quarter of my research period), spanning the period from the European discovery of the island on September 10th 1544, to the forced depopulation of the island between AD 1685-1687.

The earliest mention of the island is Juan de Cárdenas’ account of the Juan Bautista Pastene’s discovery expedition in 1544, in which he was a crew member (Medina 1896:80). He merely indicates that the island is called *Gueulli* by the natives. According to Erize (1960:187 in Goicovich and Quiroz 2008:69) the word *hueulli* means “the resting place of the ancestors’ spirit”.

In 1550 Gerónimo de Bibar, crew member of another Pastene expedition, provides a more detailed discussion of the island (1966:148-149). He indicates that the island is called *Amocha*, that there are 2 contesting *señores*, and a population of “more than 800 indians”. In his own words, he has “never seen indians with more provisions and better houses than in this island.” In fact, the Spaniards obtained important supplies of maize, potatoes, and beans, on this expedition, although they killed 14 natives in doing so. Other documents add that during this expedition, the islanders killed 5 Spaniards (Medina 1899:272). Goicovich and Quiroz (2008:69-

71), using several Mapudungun dictionaries (Valdivia 1887 [1606], Febres 1975[1764], de Augusta 1916, Mösbach 1936, Erize 1960), observe that the name *Amocha* should be interpreted as "the place where the ancestors souls are venerated".

Alonso de Góngora Marmolejo in his *Historia* (1862[1575]:104) tells the story of an Isla Mocha *principal* who bought a captive Spaniard –called Rebolledo- with a sheep. This story is further recorded by Mariño de Lobera (1865[1590s]:366) and Rosales (1878[1674]:100, 135).

The next account stems from the voyages of Sir Francis Drake, who in 1578 anchored in Isla Mocha. Fletcher (1628:46-49; 1854:95-99), the expedition chronicler, likely confused the *Amocha* name with the Spanish word "*mucho"*, which he related to the richness of the territory. He mentions the presence of "sheepe and other cattell" and maize ("which is a kinde of graine whereof they make bread"), potatoes, "with such other rootes", which they bargained for with the islanders. Fletcher also mentions that the population brought "two very fat sheepe, which they gave our Generall for a present". Fletcher notes that the natives had left the mainland for the island "to releeve and fortifie themselves." Whether the residents represented recent transplants from the mainland or not, the defensive attitude was real, and in the end, Drake's crew was ambushed by, "about 500 men, armed and well appointed for such a mischiefe," with weapons of "arrowes of reeds, with heads of stone very brittle and indented, but darts of a great length, headed with iron or bone."

Another chronicle of this voyage is the "Sloane Manuscript 61" – probably taken from the original notes by Fletcher (Fletcher 1854:93-96 note 1). This narrative indicates that the Englishmen obtained from the islanders, "fatt muttons, hens, maize, or as commonly its named, Guiney wheat, etc". Then the narrative describes the ambush, the English escape, and how a congregation of, "by estimation 2000 persons, well appointed, with bowes, darts, speares, shields, pikes, and other weapons," received them when they tried to return to rescue two captured comrades. The rescue attempt failed, and the manuscript goes on to record how the two were sacrificed in front of them, including their defleshing and cannibalization while the natives danced and sang. Further on, the narrative notes that these Indians had originally come to the island from the mainland, because of the Spaniards, "to purchase to themselves peace and safety, where, having established themselves a kingdom". Finally, the writer compares Isla Mocha to the Isle of Wight in southern England. The text is accompanied with a drawing depicting Isla Mocha (Figure 2.8). There are other accounts dating to this expedition but do not any provide any information not represented in the above two sources (Fletcher 1854. Hakluyt 1904. Wagner 1926)

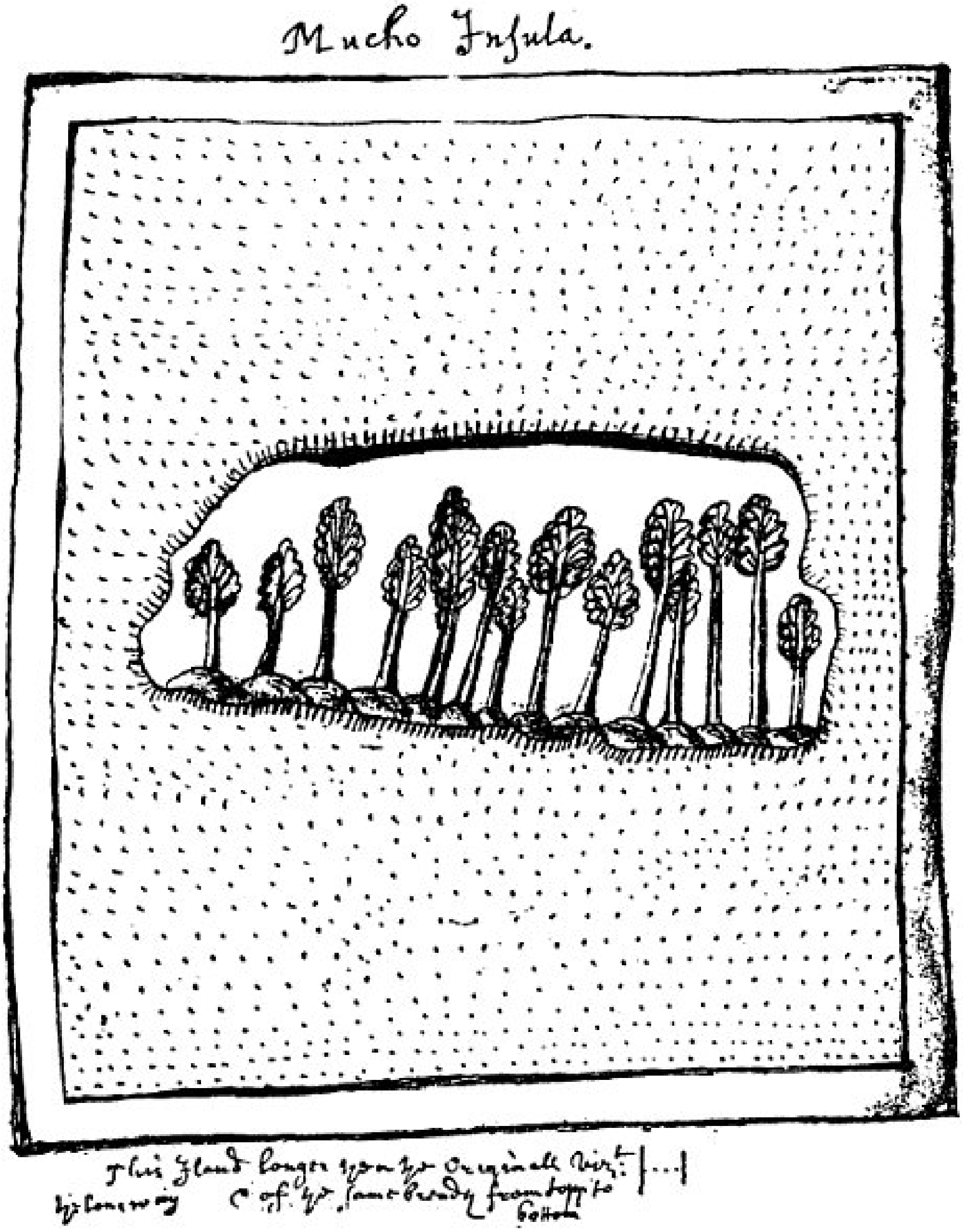

Figure 2.8 Isla Mocha. Sloane Manuscript 61, 1578 (Wagner 1926:100)

In 1587, two ships of the Thomas Cavendish expedition also visited Isla Mocha. The navigation account written by Francis Pretty (1904:302) only indicates that, “the indians fought with them with their bowes and arrows, and were marveilous warie of their Calivers”.

Richard Hawkins in 1594 (1847:144-147) was the last Englishman to leave an account of a visit to Isla Mocha. His voyage chronicle notes that Isla Mocha is “champion ground, well inhabited, and manured”. During this voyage, the English traded European goods for cattle and crops, parleyed with *casiques* and even took two of them on board their ships for a visit before returning them to the island. The Hawkins’ account is vivid in describing, for example, the importance of the “sheep of the country”, that native houses are round, and that native weapons are bows and arrows headed with stone, bone, or fire- hardened wood. The account adds that the Indians used woolen ponchos for clothing and that some of them were “most curiously wooven, and in colours”, and that the inhabitants brought to and shared with the Englishmen a “strange kinde of tobacco.”

Following Hawkins’ expedition, detailed Dutch sources dominate written accounts of Isla Mocha. This shift reflects the important location of the island as a revictualling landfall for any maritime traffic, passing through the Straits of Magellan or rounding Cape Horn. Despite this strategic setting, the Spanish established no settlements or defenses on the island. In fact, Pedro Mariño de Lobera (1865[1590s]:366) mentions a Spaniard kept captive on Isla Mocha (also mentioned by Góngora Marmolejo) named Antonio de Rebolledo, and that he was kept on the island for 2 years during these time period before being rescued.

The first of the Dutch expeditions that reached Isla Mocha was commanded by Jacques Mahu and Simon de Cordes in 1599. Their information, contained in two letters written by William Adams, merely indicates that one of the expedition ships (the Charity) arrived on Isla Mocha, where 27 crew members – including the Vice-Admiral Simon de Cordes himself – were killed (Wieder 1925).

Quite different was the experience of Oliver van Noort in 1600 (Van Meurs 1993. IJzerman 1926), whose expedition arrived during the celebration of some kind of collective ritual. The visitors saw, “many sheep and animals grazing with well plowed land.” For sheep, hens, maize, potatoes, squash, and other fruits the visitors traded knives and axes that the islanders in turn traded to mainland inhabitants. Van Noort’s expedition was also visited on their ships by “two of the main caciques or landlords,” and then the Dutch went to a, “village of about fifty houses made of straw and with an elongated shape, with a portal in the middle.” Here, the women prepared and served maize chicha to the native men and the Dutchmen. Van Noort explained that this drink is used during their parties, in which, “they congregate all the village population and one of them climbs a pole from which he makes some noises with flutes or sing." In his description -and engraving-, he depicts a population aggregation at a "village" and a U-shaped structure facing to the east and traversed by a stream. All of the elements described are extremely reminiscent of the *nguillatun* rituals performed today by the Mapuche communities of Araucania (cf. Dillehay 2007:figures 22, 33, 40, and 41. Faron 1968:84. Guevara 1911:237), which even include the construction of hut-like *ramadas* as a transitory habitation space. Additionally, it might be relevant that Van Noort expedition arrived at Isla Mocha on March 21, 1600, the autumn equinox, although this date today does not have any particular meaning to Mapuche native communities in Araucania.

Additionally, van Noort indicates that the native men take as many wives as they can feed, and that the one who has many daughters is rich since the others have to buy them with oxen, sheep, cattle, or valuable things. For cloth they use, "wool from the large sheep," and that these sheep, "have long necks and the wool is so long that it almost reaches the ground." The sheep were also used as pack animals, and the Indians refuse to sell any. The islanders also informed van Noort that in the mainland, Spaniards "there would have been beheaded", a clear reference to the 1598-1604 native uprising.

In addition to the written description, the van Noort chronicle also contains two engravings of Isla Mocha. One is called "La Moche in Chili" (Figure 2.9), and the other "Les habitans de la Mocho" (Figure 2.10). Subsequently, in the exploration accounts compiled by the de Bry editors (1602), which included that of Van Noort, the editors altered these original engravings, combining them into one, and adding many figures including celebrants of the collective pole ritual with a singer/flutist (Figure 2.11).

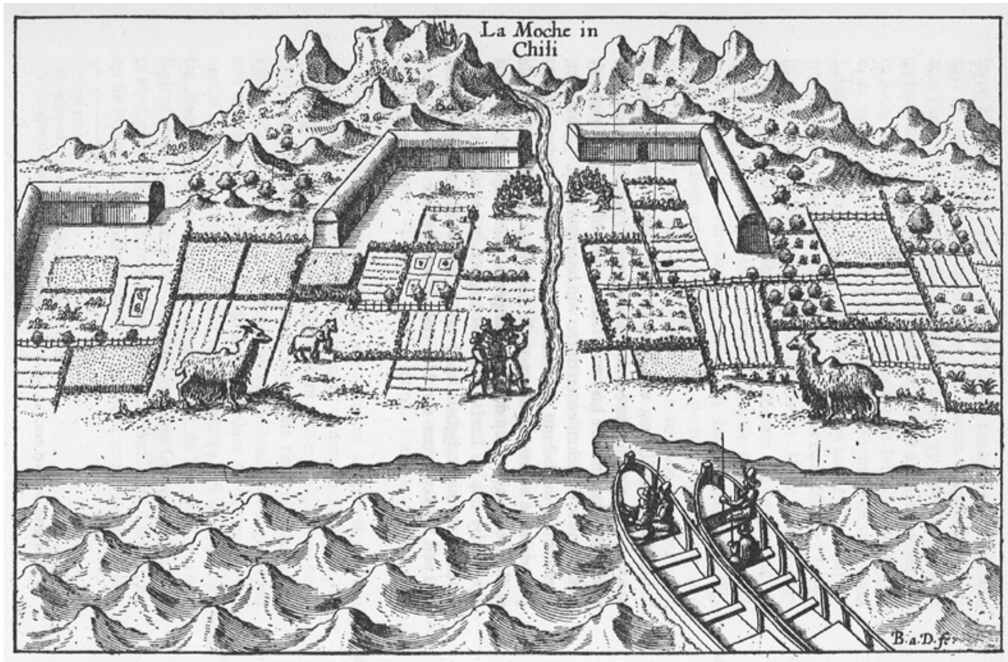

Figure 2.9 Isla Mocha. Van Noort, 1602 (IJzerman 1926a:Plaat 9)

Figure 2.10 Isla Mocha inhabitants. Van Noort, 1602 (IJzerman 1926a:Plaat 10)

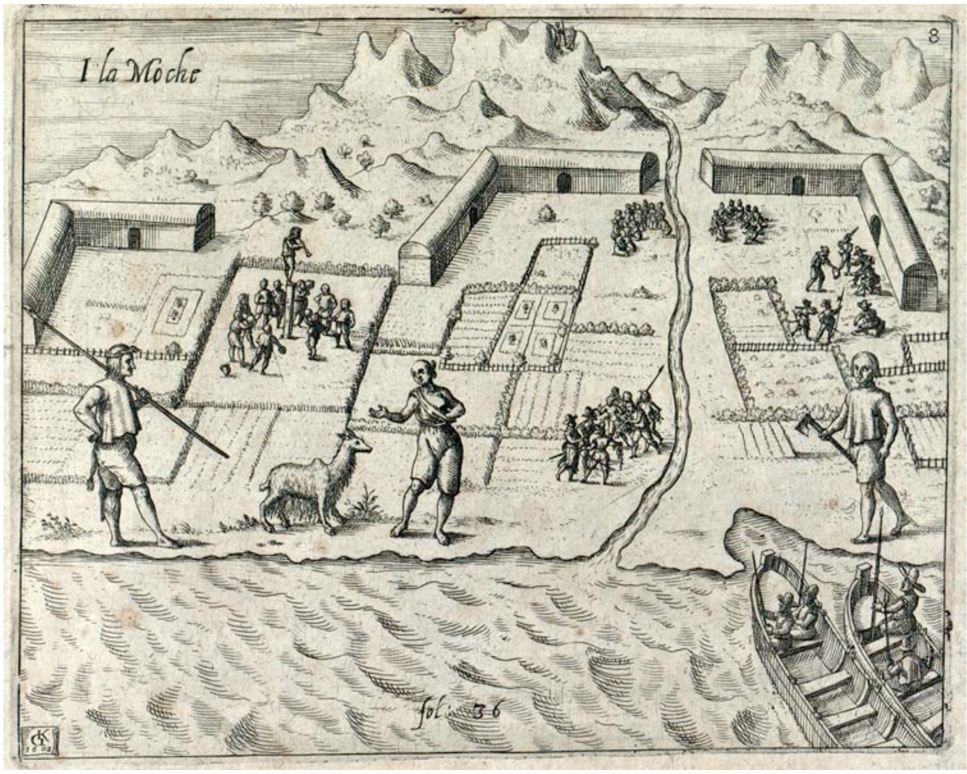

Figure 2.11 Isla Mocha. De Bry, 1602 (1602)

In1615, Joris van Speilbergen (1906:51-53) visited Isla Mocha, noting that he found, “many kinds of provisions-such as sheep, fowls, and other poultry, both cooked and raw.” Following explorer custom, he too took “the chief of the island and his son” on board ship. The visitors exchanged hatchets, beads, knives, shirts, hats, and other things, for more than a hundred European sheep and poultry. Van Speilbergen also took on board a, “sheep of a very wonderful shape, having a very long neck and a hump like a camel, a hare lip, and very long legs,” which he claimed the Indians used to till their land. This is probably the only reference – and a dubious one – of *chilihueque* used for plowing.

This account also was accompanied by an engraving, with captions (A – L) keyed to complement sections of the text (Figure 2.12). The Van Speilbergen account and its engraving - with some minor differences- (Figure 2.13) were also included in the de Brys’ 1620 compilation – I have included only the original van Speilbergen captions. Interestingly, the original engraving by Van Speilbergen is geographically incorrect, as it depicts the stream –also in van Noort’s engraving – on the seaward side of the island, with the mainland in the background. By erasing the mainland in their reproduction, the de Brys may or may not have wanted to correct this error.

Figure 2.12 Isla Mocha. Van Speilbergen, 1619 (1906:Plate No.4)

A. Are our boats in which we rowed ashore to trade with them.

B. Is the manner in which we traded with the people of La Mocha, exchanging hatchets and knives for sheep, fowls, and fruit.

C. Is the manner of sitting with their legs cross-wise, like the tailors sit in Christian countries.

D. Is the manner in which our trumpeters and other musicians gave a grand concert on the beach.

E. Are the La Mochyanes who listened to that playing with great pleasure.

F. Are their houses or huts, into which they would not let our comrades come.

G. Is the manner in which they bring along their sheep and other commodities to barter them.

H. Was our yacht, which lay close to the shore.

I. Are our four other ships, with which the boats kept up constant communication.

K. Is their manner of dress or clothing.

L. Is the strange shape of some of their sheep, which have a hump on the back like a camel.

Figure 2.13 Isla Mocha. De Bry, 1620 (2002)

In 1625, Luis Tribaldos de Toledo (1864:13), a Spaniard historian, who achieved the title of *Cronista Mayor de Indias*, attributed to Isla Mocha a population of 1000 natives. He disapprovingly added that the islanders provide food, firewood, and “country produce” to the mainland rebels and also to the Dutch.

The next written source for Isla Mocha is that of the Spanish-Chilean Jesuit priest, Alonso de Ovalle, who wrote during the first half of the 17th century. In his “Histórica Relación del Reyno de Chile” (1646:62, 1703:52), Ovalle recounts in terms similar to those used by van Speilbergen, that the island has plenty of sheep as well as hens, eggs, fruits and other provisions, and that the islanders obtained from the Dutch hats, clothes, axes, and other things they valued. He (1646:396) cites other Jesuit priests’ experiences to observe that Isla Mocha had 3000 residents distributed among 31 *caciques*. At the end of his chronicle Ovalle includes an engraving of Isla Mocha (Figure 2.14), which is a simplified version of the one by van Speilbergen, or the de Brys.

Figure 2.14 Isla Mocha. Ovalle, 1646 (1646)

Another Spanish-Chilean Jesuist, Diego de Rosales (1877[1674]:288-291), provided a richer description of Isla Mocha in his “Historia General de el Reyno de Chile”, written during the mid-to-late 17th century. He observed that the terrain is “very fertile and joyful,” with the native population producing an important amount of maize and legumes, and lesser amounts of wheat and barley. He reported the island used to have some horses, a great quantity of chicken, and “Castilliand and Chilean sheep”, which were traded with the Indians from Tirua and the mainland. Cattle used to be kept, but they were killed because they destroyed agricultural crops. Fishing is also mentioned.

In discussing exchange, he wrote that the islanders exchange poultry, mutton, potatoes, and maize, for rattles, combs, knives, indigo, and glass beads, with European ship crews. With the mainland and Paicabí indians they trade mutton, “sheep of the country”, and digging sticks, for iron axes, wedges, indigo, and glass beads. In describing natives rafts or canoes, Rosales (1877:172-173) states that they are made of maguey (*Puya chilensis*?) with a capacity of 30 people. He estimated a population segment of 300 “unfaithful indians” on Isla Mocha, who in

March each year go to Firva [Tirúa] to trade. In those rafts or canoes they crossed back and forth to the mainland, with their “houses” (probably referring to domestic artifacts), supplies, cattle, horses, oxen, and cows.

At this time (mid-17th century), according to Rosales (1877[1674]:288-291), there were fewer families than in the past, reaching only 200 warriors (*indios de lanza*). He also noted the existence of two sections in the island, one on each side of the central range, as having constant conflicts with one another.

Echoing Drake’s account about people leaving the mainland for sanctuary in Isla Mocha, Rosales complained that the Spaniards have never made war on the islanders, even though conquering them would be easy. He recounts the bad experiences of Cavendish and Cordes, adding that a “very important Cacique, called Quechumilla” inherited from his father a silver whistle obtained as planner and leader of the latter mentioned ambush. In relation to the last two facts, Rosales indicates that the islanders were never allied with the rebel natives of Tirúa and Paicabí because they never provided them warriors (“*no les han dado jamas soldados ni lanzas*”). Rosales (1878[1674]:110, 135) made reference to the Isla Mocha captive Rebolledo (also mentioned by Góngora Marmolejo y Mariño de Lobera). According to Rosales, the Spaniard was bought by one of the 10 island *caciques* for 2 sheep and 1 salt stone. He was eventually rescued by a passing ship.

The Rosales account also adds more information on the afterlife role of Isla Mocha (1877[1674]:162-164), 1991[1674]:78-79, 89-91). He mentioned that according to the natives, the souls of the dead in their travel to the afterworld - located “on the other side of the sea” - have to pass through a small and uninhabitable island south of Isla Mocha (probably Islote Quechol). Other sources (Olivares 1864[1767]:52 and 1874[1738]:88. Córdoba y Figueroa 1862[1739]:120-121, 306. Febres 1765:497-498, 643. Molina 1787:85-86 and 1795:91. Carvallo Goyeneche 1875[1796]:145-146, 182-184 and 1876[1796]:137. Bueno 1876[1777]:310. Havestadt 1777:668,785. Gómez de Vidaurre 1889[1789]:320), postdating the Isla Mocha depeopling, add the image of a woman converted into a whale (*Trempilcahue* or *Tempulcague*) as the vehicle used to cross to either Isla Mocha and/or to reach the other side of the sea, where the afterlife world is located. The Rosales narrative (1991[1674]:89-91) indicates that the Isla Mocha inhabitants provided information about the dead relatives to the mainland people; this, in order to get gifts and attentions from them. In the afterlife place, the only sustenance is black potatoes and black chicha (1877[1674]:162-164), 1991[1674]:78-79, 89-91). These afterlife conditions, he noted (1877[1674]:162-164), corresponded to only the "third kind of people, which is the common of men and women," with conditions being very different for the caciques and the warriors.

The last ethnohistoric treatments of the island relate to the depopulation process. The action was undertaken by the Spanish between 1685 and 1687 as part of a policy to end the provisioning role played by islanders with foreign shipping, and to discourage foreign occupations on the island. Thus when Edward Davis – an English buccaneer – visited Isla Mocha in 1686 and again in1687 (Wafer 1903:179-181, 191-192. Burney 1816:192-193, 210); he only found residents on the first visit. When yet another English buccaneer, John Strong (Burney 1816:333), visited in 1690, he found "horses, dogs, and the ruins of two deserted towns,"

The islanders were relocated in a valley south of what was then the town of Concepción and, indeed, that valley started to be called "Valle de la Mocha". In 1751, after an earthquake and tsunami destroyed Concepción, that town's surviving population moved to the "Valle de la Mocha". Additional documents relating to this 18th century period exist which illuminate the dissolution of this native community into the colonial mainland social structure, but they are not relevant to this research (Quiroz [1994]. Quiroz and Olivares [1997]. Goicovich and Quiroz [2008]).

The documents most closely describing the deportation process are themselves of great anthropological interest, constituting transcriptions of several hearings, confrontations, and interrogations of natives, both from Isla Mocha and Tirúa. These documents have been comprehensively studied and presented by Quiroz (1994), Quiroz and Olivares (1997), Goicovich and Quiroz (2008), and Goicovich (2010). For these reasons, I will refer here only to the information most germane to my own study.

These documents reveal that in 1684, the Spanish authorities captured in Isla Mocha several natives, among them an Isla Mocha cacique called Anguinegueno or Anguengueno [Agüigüenu] and a Tirua cacique called Quilapichun. This last individual had crossed to the island with 24 indians in for rafts or canoes in order to trade "sheep of the country". As part of one hearing, Agüigüenu admitted that eight island residents (Caiunpangue, Quechanaguel, Eniptureo, Millatipay, Elentaro, Tamepilla, Guenubilo, and Melicheuque) had traded mutton, sheep, poultry, potatoes, and maize for knives and beads with English ships in 1684 (the Charles Swan expedition). In another hearing Agüigüenu makes reference to "the [apparently local] *caciques* of Mocha Quitalab [Quetelabquen?] and others"

In addition to these glimpses of native leadership and there exchange activities, the depopulation documents are notable for including a census that Quiroga, the Spaniard officer in charge, produced as part of the depopulation. This census corresponds just to the 1685 deportation campaign, which was the most significant in demographic and political terms. Quiroga himself, in relation to Araucanian *caciques*, wrote:

> *El señorío y dominio que estos indios tienen unos sobre otros es sin que los súbditos tributen al cacique ni éste los obligue a que le sirvan, ni obedezcan, sino al modo que los españoles reconocen superioridad en el que tiene mayor caudal, que le respetan por el dinero o por los muchos parientes; pero si no quiere respetarle y es de corazón alentado, al sujeto, parientes y dinero los atropella como gente de poco valor y sustancia; así estos indios respetan al cacique como al más rico entre ellos, y como a quien tiene más mujeres, de que resultan los muchos parientes y los muchos hijos, las grandes sementeras, las copiosas cosechas y la mucha chicha, que es el tesoro mayor con que se conduce la mucha gente para la disposición de los que les conviene, o para la labor de los campos, o para beber y bailar, que es el principal asunto y fin de todos los negocios.*
> (Quiroga 1979[1692]:25)

2.4.1 Isla Mocha Demography and Political Organization at 1685

The Quiroga census compiled information at the level of each family unit, providing the name, age, and relationship to the head family for each individual, as well as indicating to which *cacique* each family belonged (Quiroz 1991. Goicovich 2010).

The census recorded a total population of only 588 people. These were registered as belonging to two different *reducciones*, one headed by the *cacique* Quetelabquen (an individual 60 years old), and the other by the *cacique* Agüigüenu (40 years old). The Quetelabquen's *reducción* consisted of 240 people, distributed among 49 families plus four single isolated males. Meanwhile, the Agüigüenu's *reducción* consisted of 348 people, in 67 families, plus four "isolated" individuals (these are two groupings of two people each, but not identified as a family by the census taker). Additionally, in Quetelabquen's *reducción* was another individual identified as a *cacique*, Laguilican (80 years old) who could be a superannuated *cacique*; and another individual, Guiriñancu, identified as a *capitanejo*.

If the eight isolated individuals are excluded, the census records116 families on the island, with a mean family size is 5 (4.81 for the Quetelabquen *reducción* and, 5.13 for the Agüigüenu *reducción*). The following chart presents the data on family size.

Table 2.2 Family sizes on the 1685 depopulation census

# of people per family	Overall Island	On Quetelabquen *reducción*	On Agüigüenu *reducción*
2	23	9	14
3	21	12	9
4	15	6	9
5	16	7	9
6	11	3	8
7	11	6	5
8	9	2	7
9	2	1	1
10	3	1	2
12	1	1	0
13	2	0	2
14	1	0	1
16	1	1	0
Total	116	49	67

It is worth observing that even though Quetelabquen and Agüigüenu each were recorded as having large families (n=9 and n=10, respectively), neither has the largest family on the island. The census in addition provides information in 107 cases about a family head and the number of his wives.

Table 2.3 Monogamy and polygamy on the 1685 depopulation census

# of wives	Overall Island	On Quetelabquen *reducción*	On Agüigüenu *reducción*
1	77	32	45
2	22	10	12
3	6	2	4
4	2	1	1
Total	107	45	62

The most common situation is by far a monogamous family. The *cacique* Quetelabquen is recorded as having only a single wife, but the *cacique* Agüigüenu is the sole individual with four wives in his *reducción*.

The census provides a terminal population count, but this figure may very well reflect the effect of European introduced diseases, which would have likely impacted the population even prior to the first eyewitness European accounts. The highly impressionistic population estimates provided in earlier ethnohistoric accounts suggest an island population ranging from somewhat larger to four even five times the 1685 size. For example, if we take the figure of “200 warriors” presented by Rosales, and use the documented proportion of *labradores* to *cona* sketched from Boccara (2007:122) and mentioned above, this ranges from 2:1 to 6:1 *labradores* per *cona*, to which we can add for each male individual, one wife and one child. The Table 2.4 compiles the different population estimates available for Isla Mocha suggested by the pre-census estimates.

Table 2.4 Ethnohistoric population estimates

Source, Year			**Population estimate**
Pastene, 1550 (Bibar 1966:148)			+ 800 people
Drake, 1578 (Fletcher 1854:98)	500 men ambush	= 357 families?=	1785 people?
Drake, 1578 (Fletcher 1854:95)			2000 people (?)
Tribaldos de Toledo, 1625 (1864:43)			1000 people
Ovalle, 1646: 396			3000 people (?)
Rosales, 1674 (1877:171-172)	300 unfaithful indians	= 214 families? =	1071 people?
Rosales, 1674 (1877:288-291)	only 200 warriors	= 143 families?=	714 people?
Rosales, 1674 (1877:288-291)	only 200 warriors	= 600 males?=	1800 people?
		= 1400 males?=	4200 people?
Census, 1685 (Quiroz 1994, Goicovich 2010)			588 people
Quiroga, 1685 (1979:460)			800 people
Morales Melgarejo, 1685 (Goicovich and Quiroz 2008)			653 people
Garro, 1686 (Goicovich and Quiroz 2008)			+ 700 people
Carvallo Goyeneche, 1796 (!875b:183-184)			650 people

Overall, we can reasonably estimate an island population of 600 - 2000 for the ethnohistoric period. The upper limit is difficult to calculate, but I have made an educated guess, by setting a number of 1.4 “adult males” per family (that number is the average number of males over 15 years old per family in the census), and considering each family as consisting of five people.

Keeping in mind that the ethnohistoric accounts represent a view of things through a European's eyes, the accounts are consistent in describing Isla Mocha subsistence as based on a combination of agriculture (maize, potatoes, squash, legumes, and the introduced wheat and barley), herding of native camelids and later sheep, oxen, horses, and chicken, and hunting-gathering practices, although references to fishing and shellfish are scant. Maize chicha (produced only by women) is identified as an important ritual beverage.

The accounts also provide several glimpses of a native political economy. Although the association between household size and political leadership is not strongly reflected in the census, ethnohistoric accounts mention the prestige associated with having several wives, and the bride price received by each marrying daughter. For example, out of 107 cases (above chart) there are only eight families with more than two wives, implying that this was a relatively special domestic arrangement.

That large animals (camelids, sheep) are commonly mentioned in connection with bride price, and with the ransoming of European individuals, indicates the value accorded to cattle, including the native, fiber-producing "sheep of the country", which were not sold, but only given as gifts.

The predilection of European explorers to find sovereign leaders in every native group encountered has been well documented. Nonetheless, there can be little doubt that the ethnohistoric island featured some kind of chiefly organization. Certainly by the time of the 1685 census, the Spanish authorities were both sophisticated and experienced in recognizing native leadership positions. As early as 1550, Bibar mentioned the existence of 2 *señores* in conflict, and Rosales in 1674, 2 sections also in conflict . Hawkins and van Noort each indicate having taken on board ship two *caciques*, while perhaps insinuating that they were not the only ones with that title. The census, of course, recorded two *reducciones*, each under a different *cacique*. In addition, the sources at least suggest a lesser position of social leadership (*capitanejo*).

Unfortunately, the ethnohistoric sources say little about the material differences between chiefs and commoners, or among commoners, or about the duties of the *cacique.* However among the activities of these leaders highlighted by the ethnohistoric sources are involvement in external ties (that is, meeting and visiting foreign ships), and involvement in significant trade with mainland residents. This exchange included the circulation of European introduced goods (knives, axes, beads, clothes, rattles, hatchets, combs, cattle, and indigo) to mainland residents, but also included native items (such as digging sticks and camelids). It is perhaps revealing that among the Spanish arrests was the Tirua cacique who had crossed to the island with 24 Indians in four rafts or canoes to trade "sheep of the country".

2.4.1.1 Location of the Cacique Residential Site Both van Noort's and van Speilbergen's engravings show a stream coming off the central mountain range to the coast through the only low east-west pass in the range, and cutting through a large community. This feature can only represent the modern *Quebrada del Camino Nuevo*. The modern stream bisects the P31-1 site as will be discussed below. Based on this, we can tentatively identify P31-1 as a political (chiefly?) center for, at least, the eastern side of the island. In fact, this side seems to be the one that was consisted visited by the European sailors, and indeed it is the most amenable island side for boat landings. If this represents the principal settlement on that side of the island (and it was depicted as such in the van Noort's and van Speilbergen's engravings), we can further associate the site with location of the *cacique* Agüigüenu *reducción* of the census, taking in consideration that today the eastern section is the most populated.

On the other hand, it is important to remember that from the ethnographic information the U-shaped structure is a transitory habitation space built and used just for the duration of the *nguillatun* ritual, and then abandoned. Therefore they do not have to be interpreted as a village or homestead. In turn, if the engravings are accurate and the P31-1 residential area was also a ritual space, this would emphasize the importance of this site in Isla Mocha, at least in early historic times.

3.0 ISLA MOCHA: ECOLOGY AND PREVIOUS RESEARCH

3.1 GEOGRAPHICAL SETTING

3.1.1 Geology and climate

My research area is located on Isla Mocha, an island 30 km off the coast of mainland Chile (Figure 3.1). Isla Mocha has an area of 52 km^2, measuring roughly13 km from north to south, and 5.5 km from west to east. The island is made up of two clear and contrasting components: a rather flat coastal strip that surrounds the entire island, with a width between 0.2 to 2 km, stretching from sea level to 50 masl; and a steep, heavily forested hill range at the center that goes from 50 masl to almost 400 masl. The former is the area of today human habitation and is divided in 32 private *parcelas*; meanwhile, the forest is a protected state-owned *Reserva Natural*. As Nelson and Manley (1992:64) indicate “From a distance Isla Mocha looks like a wide-brimmed hat”.

Isla Mocha is of a recent geological origin. According to Tavera y Veyl (1958), Miocene formations (Navidad and Ranquil Formations) occupy the main part of the island. Two marine and eroded terraces of Pleistocene age are located above 250 masl. The coastal strip is of Holocene age. The island would have emerged above sea level during the Pleistocene, and from that date it has kept rising. Nelson and Manley (1992) have estimated that Isla Mocha has experienced a fall of relative sea level of 38 m during the last 6000 years caused primarily by rapid tectonic uplift of the island.

Figure 3.1. Isla Mocha from mainland Tirúa

The sea between the island and the mainland is about 18 to 37 meters deep. Strong currents help isolate the island from the mainland even further. Currents in this run northward and, “it is common in this channel experience irregular and sudden currents that obligates a careful pass” (Vidal Gormaz 1880:220). Several historical shipwrecks are reported for this island (Vidal Gormaz 1901), and its reefed and rocky coast prevent the landing of ships of deep draft. The winter season makes any contact between the island and the mainland very difficult, as the best months for navigation from December to March. Modern kayakers estimate a passage of about 7 hours to go from mainland Tirúa to Isla Mocha (La Tercera 2007).

The climate is of a Warm-summer Mediterranean type (Csb) (Peel et al. 2007). For the western part of the island, the average minimum and maximum temperatures are 9.5 and 15.3 C degrees, respectively; while for the eastern part average minimum and maximum temperatures 9.3 and 15.6 C degrees. The main differences between the two sections are related to relative humidity and precipitation, which make the western section a little bit more humid than the eastern one. The values for the former are 88% average and 1372.9 mm accumulated per year, and for the later 81% and 1260.2 mm (Hajek and Di Castri 1975). Precipitations is distributed over the entire year, but concentrated from April to September (over 100 mm per month). On the other hand, January and February are prone to summer drought and are considered semiarid months (Figure 3.2).

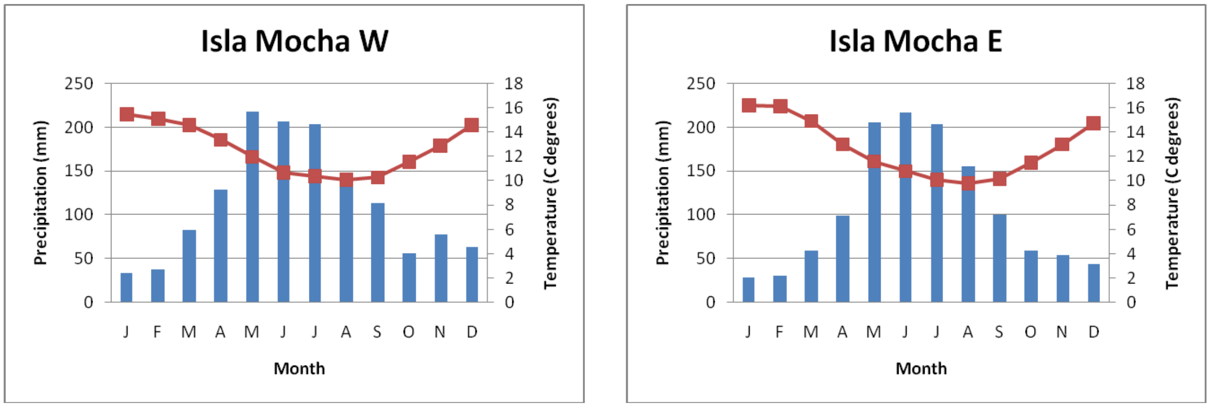

Figure 3.2 Climographs for Isla Mocha

3.1.2 Faunal Resources

The native mammal fauna of Isla Mocha is thought to have originally been limited to five small rodents: *Akodon longipilis* (Long-haired grass mouse), *Akodon olivaceus* (Olive grass mouse), *Geoxus valdivianus* (Long-clawed mole mouse), *Oligoryzomys longicaudatus* (Long-tailed pygmy rice rat), and *Octodon pacificus* (Pacific degu). So that any other mammals represented on the island, particularly large and/or carnivore mammals (Peafur and Yáñez 1980:111), are there as the result of human introduction, intentional or unintentional. Whether of not this is true, prehispanic Archaic and Ceramic period sites on the island include remains of cervids (*Pudu pudu*, pudu), a large rodent (*Myoscastor coypus*, nutria), camelids (*Lama guanicoe*, guanaco), fox (*Lycalopex* sp. and/or *Lycalopex griseus*, South American gray fox), felines (*Oncifelis* sp.), and mustelids (*Galictis* sp.otter or weasel family). European contact in the 16th century resulted in the introduction of Old World mammals such as horses, sheep, cows, pigs, dogs, rats, and cats.

Marine resources recognized from archaeological sites include sea lion (*Otaria flavescens* South American Sea Lion), which continue to have colonies in Isla Mocha area, and members of the cetacean order. Fish, of course are plentiful, and a full description of those identified from archaeological sites can be found in subsequent chapters and the “Appendix C”. The most important economic species represented archaeologically are: *Aphos porosus* (Banded toadfish), *Auchenionchus microcirrhis*, *Auchenionchus variolosus*, *Bovichthys chilensis*, *Callorhynchus callorhynchus* (Plownose chimaera), *Cilus gilberti* (Corvina drum), *Genypterus maculatus* (Black cusk-eel), *Gobiesox marmoratus*, *Labrisomus philippi*, *Mustelus mento*, *Pinguipes chilensis*, *Sebastes capensis* (Cape redfish), *Sicyases sanguineus*, *Thyrsites atun* (Snoek), *Trachurus symmetricus* (Chilean jack mackerel).

Over 102 species of bird are represented on the island, "either permanent and transitory or migrant" (Pefaur and Yáñez 1980:111). Among these the more prominent, since they have being recovered in archaeological contexts, are *Pelecanus thagus* (Peruvian pelican), *Phalacrocorax atriceps* (Imperial shag), *Phalacrocorax brasilianus* (Olivaceous Cormorant), *Phalacrocorax boungainvilii* (Guanay Cormorant), *Puffinus creatopus* (Pink-footed Shearwater), *Spheniscus humboldti* (Humboldt Penguin), *Anas* sp. (ducks), *Haematopus* sp. (Oystercatchers), *Larus* sp. (gulls), and *Thalassarche* sp. (albatrosses). Of these species, the most interesting is the *Puffinus creatopus* since it is a migratory bird that breeds only in Isla Mocha and the Juan Fernández Islands from late October to early May. A historical period addition was the *Gallus gallus* (domestic chicken), although a controversial claim has been made for the prehistoric presence of chicken at a mainland Chilean site (El Arenal 1; Contreras et al. 2008. Storey et al. 2007).

Concerning the amphibians, only 4 species are present in the island: *Batrachyla taeniata* (Banded Wood Frog), *Eupsophus insularis* (Mocha Island Ground Frog), *Pleurodema thaul* (Chilean Four-eyed Frog), and *Rhinoderma darwinii* (Darwin's Frog). About the reptiles, only 2 species are present: *Liolaemus cyanogaster* (Valdivian Lizard) and *Tachymenis peruviana* (Short Tail Snake). None of the above species have been recovered, so far, on archaeological sites.

"Appendix C" fully presents Isla Mocha faunal data compiled from different sources such as archaeological research, ethnohistoric sources, zoology studies, and modern observations.

3.1.3 Plant resources and agriculture

According to Pefaur and Yañez (1980:107-108) it is possible to recognize 4 vegetation zones:
(1) the coastal strip with perennial yearly plants and low shrubs, well adapted to the wind and saline environments; (2) the artificial prairie or cultivation fields with gramineae and leguminosae, mostly artificially introduced; (3) the piedmont or shrub, considered a cut-down and degraded forest, with predominance of *Aristotelia chilensis* (Chilean wineberry), *Fuchsia magellanica* (fuchsia), *Peumus boldus* (boldo), among others; and (4) the valdivian or mountain forest including evergreen large trees, especially *Aextoxicum punctatum* (olivillo), and also

Drimys winteri (winter's bark), *Luma apiculata* (shortleaf stopper). These authors highlight the absence of the very characteristic species of the temperate rain forests of mainland Chile, members of the Nothofagaceae and Proteaceae families (Lequesne et al 1999:35. Pefaur and Yáñez 1980:108).

In "Appendix D" I provide comprehensive catalogue of plant resources represented in archaeological contexts or ethnohistorical/ethnographical accounts, including information on their edibility, economic uses, and calendric availability and requirements. The number of plants so indicated consists of 82 taxa, ranging from algae to trees. A total of 21 wild plant types known to have a prehispanic or historical period food use were identified in my excavation samples. There are 8 additional plants that I strongly suspect were also consumed (based on ethnohistoric accounts or analogy with mainland sites) that were not represented in my samples. In the case of *Bromus* sp. there were three known native species that had economic importance for the native population of Southern Chile as cultivated cereals. These were *Bromus bertorianus* (teca), *Bromus catharticus* (lanco), and (the now extinct) *Bromus mango* (mango).

Staple domesticates can be divided into the native (pre-16th century) and introduced (post-AD 1550 at least). In the first category are quinoa (*Chenopodium quinoa*), squash (*Cucurbita* sp.), vinagrillo (*Oxalis rosea*), bean (*Phaseolus vulgaris*), potatoe (*Solanum tuberosum*), and maize (*Zea mays*). Each of these but *Cucurbita* sp. and *Oxalis rosea* has been reported from archaeological studies. All but *Chenopodium quinoa* and *Oxalis rosea* are also mentioned in historical accounts. In the introduced category are garlic (*Allium sativum*), oat (*Avena* sp.), fat hen (*Chenopodium album*), barley (*Hordeum vulgare*), pea (*Pisum sativum*), radish (*Raphanus sativus*), and wheat (*Triticum aestivum*).

Little information is available on the distribution of soil types and agricultural potential on the island. Modern cultivation has concentrated on the "Terrace III" between 38 and 25 masl (Prieto 1997). This is also where most of the archaeological sites are located, suggesting a prehispanic preference of cultivation of this zone as well. In order to fill some of the gap in information about agricutural regimes, I designed a tentative productive calendar for Isla Mocha. For this calendar, I considered only those species with edible parts, and the periods in which those parts were available. In the case of crops, I considered also the periods of sowing and haversting. In brief, the winter – and even most of the spring months, July to November - represent a critical low periods in the absolute amount of non-cultivated resources available. In contrast, the summer season into the fall season – December to April – is a period of high wild resource availability. Summer is also the season for harvesting crops, although for some species this could extend into the fall and April- May. Thus the months in which the crop sowing is required (October-November) coincide in part with the critical period on resources. This could potentially represent a scheduling problem that would have to be met by a division of domestic labor, reliance on year-round aquatic resources, or use of stored resources. The detailed calendar is presented in “Appendix D”.

3.2 PREVIOUS ARCHAEOLOGICAL RESEARCH

3.2.1 1902-1990

The first scientific approach to the Isla Mocha archaeological record can be dated back to the Museo Nacional de Historia Natural’s expedition commanded by Reiche in 1902. The expedition reported the existence, following information provided by *inquilinos*, of 3 cemeteries, located at Cerro de los Chinos, at the south of Punta Bergantin, and in the southwest corner of the island (these correspond to today´s *parcelas* 27, 9 and 10, and 22 and 23, but cannot be matched to currently known archaeological sites). Among the items collected by, or donated to, this expedition were a doughnut shaped stone, three stone and one iron axe, talc stone whistles, silver earrings (in an El Vergel and/or “reche-Mapuche” style) and a copper knife, four copper beads, quartz and silex projectile points, guanuco and pudu bones, and three human skulls. The investigators recognized that the whistles, earrings, beads, and projectile points were manufactured in non-local raw materials, that the iron axe and copper knife dated to historical times, and that the guanaco and pudu were animals already extinct from the island.

During the rest of the century, the Isla Mocha archaeological record is only mentioned tangentially in the context of studies that deal with specific topics. These include craniological studies (Henckel 1954, 1957), the distribution of lithic insignia (Reed 1924) and funerary urns and their association with metallic artifacts (Bullock 1955, 1970). In 1964, San Martín mentions the existence of cemeteries on the island, “one in the North Beach and other in the South Beach” (1964:67). It is not clear if he carried out excavations, but he mentions the presence of white and red decorated ceramics.

It is not until the 1990s that new archaeological investigations were carried out at Isla Mocha. In 1991 the “equipo de la Dirección Museológica de Chile Austral, Universidad Austral de Chile, Valdivia”, reported the excavation of a test pit in *parcela* 23, from which were recovered, “important evidence of Mapuche occupations of supposed early affiliation.” Additionally, they mention reconnaissance of other sites and surface collections (Boletín de la Sociedad Chilena de Arqueología Nº12 1991:11), but, unfortunately no further information about these endeavors has been published.

3.2.2 The Quiroz and Sánchez research projects

True systematic archaeological and anthropological research in Isla Mocha only started with the efforts of Daniel Quiroz and Marco Sánchez in 1990, with a grant from the *Dirección de Bibliotecas, Archivos y Museos*, and under the name of “Reconomiento Antropológico de la Isla Mocha” (1990-1991). After this project, the principal investigators, along with other researchers such as Massone, Zumaeta, Sanzana, Vásquez, and Contreras, implemented a continuing research program until 2006, under the auspices of the Fondo Nacional de Desarrollo Científico y Tecnológico (Proyecto Fondecyt 1921129 “Estrategias adaptativas en ecosistemas culturales insulares: el caso de Isla Mocha [1992-1995], 1950175 “Relaciones ecológico culturales entre Isla Mocha y la costa de la provincia de Arauco” [1995-1998], 1990027 “Estrategias adaptativas en sistemas culturales insulares del litoral higromórfico chileno” [1999-2002], and 1020272 “Estrategias adaptivas entre los grupos El Vergel en las costas septentrionales de la Araucanía” [2002-2006]). The “Catastro Patrimonio Arqueológico Mapuche, Provincia de Arauco” (Quiroz 2003) was developed by this same team.

All this research, undertaken from the perspective of the historical ecology anthropology, looked to document and to characterize the “adaptive strategies” developed by the different island populations (Archaic hunter-gatherers, Ceramic culture residents, today’s farmers) through time. In order to fulfill their research goals, their fieldwork included a survey of the entire coastal strip, as well as the excavation of test pits and of wider areas in selected archaeological sites.

Their survey recorded 42 archaeological sites, two of them within the *Reserva Natural Isla Mocha*. Of these sites, 11 represent Archaic hunter-gatherers, mostly concentrated in the northern area of the island. Twenty-nine sites are ascribed to either the Pitrén Complex, El

Vergel Complex, or both, and these are well distributed throughout the coastal strip. There are two other sites not mentioned in the *Catastro* but in Goicovich and Quiroz (2008), for which I do not have information on chronological or cultural position.

3.2.2.1 Previous Ceramic Studies For the El Vergel Complex at large the stock of ceramic vessels is constituted by: symmetrical jars, asymmetrical jars, *ollas*, bowls (*cuencos* or *pucos*), plates (*escudillas* or *platos*), bottles, mugs (*tazas* or *tazones*), urns (and/or big containers), and urn caps. The loose correlation of these vessel forms to rim types is outlined in Table 3.1, but these are only general associations. For example, most jars have everted rims, although some of them present slightly everted rims or direct rims.

Table 3.1 Ceramic vessels and vessel rims correspondence

Everted Rim	Direct Rim	Incurved Rim
Symmetrical Jars		
Asymmetrical Jars		
Ollas		
		Bowls
	Plates	
Bottles		
	Mugs	
Urns		
Urn caps		

Prior to my research, there had been three independent studies of Isla Mocha archaeological ceramics (Adán 1995. Sánchez 1997. Donoso 2010). Each one of these studied generated a new ceramic typology, with some disagreement between them. These 3 typologies and its distribution in the sites I investigated (among these P31-1 and P5-1) are described in the “Appendix A".

Each of the three studies agrees that Smoothed and Burnished finish pottery types are the most common. In contrast, Slipped and other decorated (incised, coated) types constitue a very small fraction of the entire sample. This observation is relevant because it is the painted red over white (or “Valdivia”) types, that are used to diagnostically identify El Vergel Complex assemblages.

According to Sánchez (1997) slipped pottery increased through time in the upper levels of the five sites used in his analysis. Adán added that these types are the red slipped and orange coated wares. Meanwhile, Donoso indicates that the burnished types predominate in the lower levels, by are replaced by the smoothed, decorated, and coated finishings in the upper levels.

The three researchers agree that the manufacturing technique is coiling. Among the vessel shapes they identify as most common are: jars (*jarros*, restricted shapes with neck), *ollas*, large vessels and/or urns, and bowls (*cuencos*, open shapes). Adán has pointed out that jars and smaller vessels are mostly slipped and burnished, instead while the large forms and/or urns tend to be smoothed and burnished. Finally, Sánchez and Adán propose that the pottery is manufactured locally (at the island). This finding is based on several lines of evidence including the local availability of relevant clay, the presence of possible kilns at P31-1, on the stone polishers and unfired clay pieces found at several sites, and on the few sherds showing repair holes.

Trying to integrate these typologies is an aim well beyond of my project goals. At the same time, my intention is not to generate yet another new typology. Given the lack of diagnostics in my samples, and the weak linkage between rims and vessel forms, I eschewed use of these typologies in favor of other approaches to ceramic variability. These approaches will be presented in the Methdology section.

3.2.2.2 Previous Lithic Studies Jackson (1997. Sánchez 1997) analyzed the lithics from several ceramic period (mostly post-1000 AD) Isla Mocha sitesL (P5-1, P21-1, P22-1, P25-1, P31-1). The details of these analyses are summarized in "Appendix B". For his studies, Jackson distinguished six raw material groups: Basalt, Quartz, Sandstone, Obsidian, Silex, and Other Rocks. Jackson found that the locally available basalt was the most widely used raw material (76.8%), followed by the "Other Rocks" groups (12.1%). Foreign raw materials such as obsidian (0.4%) and silex (0.1%) were extremely rare in his sample.

For P31-1, Jackson segregated the stone tools into three main groups. The first category consisted of polished lithics, including axes (n=2), polishers (n=12), indeterminate tools (n=2), and grinding tools such as manos (n=2) and grinding stones (n=1). The second group consisted of the pecked stones, including anvils (n=4) and hammerstones (n=7). Finally, the chipped lithics, included choppers (n=6), edged cutting tools (n=13), modified flakes (n=12), pounders (n=2), and projectile points (n=5). Jackson (1997) noted the widespread use of a bipolar technique for core reduction. This technique allows the toolmaker to take advantage of the local small cobbles, and to therefore maximize tool production in a context in which good quality raw materials are scarce.

3.2.2.3 Previous Faunal Remains Studies Among the previous faunal studies are analyses of two site in my research area (P31-1 and P5-1; Becker 1997, Sánchez 1997, Sánchez et al. 1994). The P31-1 sample of 1345 bones was generated from two non-contiguous 2 x 2 m excavation units. This assemblage displayed a predominance of *Lama guanicoe* (n=490) and and MNI of 6 individuals (3 adult and 3 juvenile). Next most common were fishe bones (n=449), with an MNI of 22 *Gobiesox marmoratus*, 15 *Trachurus symmetricus*, and 8 *Auchenionchus variolosus* identified. Rodent followed (n=289), from an MNI of 18 *Octodon pacificus*, and 4 *Oligoryzomys longicaudatus*. The bird remains reached a NISP of 94. *Otaria byronia* was present with a NISP of 16, corresponding to 1 adult individual. Finally, 7 cetacean bones were identified. Unfortunately, the analysis does not provide accompanying information on the stratigraphic context or on temporal trends of these faunal remains.

The P5-1 sample of 365 vertebrate bones came from a 1 x 1 m test pit. In this assemblage were represented fish (n=167), camelids (n=117), birds (n=43), otariids (n=41), rodents (n=41), and cetaceans (n=6). The fish MNI was 59 individuals, with *Gobiesox marmoratus*, *Thrachurus symmetricus*, and *Auchenionchus* sp. most common.

Bone artifacts from Isla Mocha archaeological contexts include: hoes, needles, polishers, spatulas, fishhooks, spindle whorls, harpoon heads, wedges, drills, and items of adornment (tubes and beads). Most of these artifacts were manufactured from guanaco bones, although the islanders used fire-hardened cetacean bone for hoes. The local lack or difficult access to good quality and of large size lithic raw material helps to explain the development of this local bone industry. In other words, the absence of the former was partially overcome by the use of the last one.

3.2.2.4 Previous Paleobotanical Studies Rojas and Cardemil (1995) analized a stratigraphic column of botanical material from P5-1 recovered by means of flotation. This allowed them to identify: quinoa-like, *Chenopodiaceae* specimens of two different taxa, and called by them *Chenopodium* sp. 1 and *Chenopodium* sp. 2, Solanaceae, Gramineae, Polygonum, Compositae, and Silene seeds. However, the only charred seeds recovered were of the quinoa-like taxa.

Their study also divided the stratigraphic column into three sections. The Zone C section (120-50 cm deep) held most of the quinoa-like seeds. The Zone B section (50-30 cm deep) displayed a decline in quinoa-like seeds, and a slight proportional increase in *Chenopodium* sp.2. Finally, the Zone A section (30-0 cm deep) held remains of Solanaceae, *Chenopodium* sp. 1 and *Chenopodium* sp. 2. The only radiocarbon dates obtained were from Zone C, and place this section from at least 650 AD up to 1435 AD. The authors speculated about the absence of maize seeds in their sample, but at P31-1 and P25-1, Sánchez et al. (2004) identified small maize cobs in layers dating to 1276 to 1618 AD and post 1350 AD respectively.

3.2.3 Local Chronology

3.2.3.1 The Quiroz and Sánchez sequence for the "ceramic cultures" period (AD 400 to AD 1685) in Isla Mocha. The most complete cultural sequence of ceramic period Isla Mocha has been proposed by Quiroz and Sánchez. This sequence, synthesizing the ceramic, faunal, and botanical studies mentioned above, was intended to mark thresholds of societal change on the island, as well as to capture some of the divergences between developments on the island and on the Araucania mainland. The sequence makes use of only the diagnostic ceramic assemblages and largest sites (P5-1, P21-1, P25-1, and P31-1) and leaves other sites (as P10-1, P12-1, and P22-1) aside. Most of the absolute chronology comes from radiocarbon dates, with the exception of P21-1 for which termoluminiscence dates were also used. These last were "calibrated" through a cumbersome exercise that added 100 years to each date. The chart below presents the dates without Quiroz and Sánchez "calibration".

Quiroz and Sánchez distinguish four phases within the "the ceramic cultures" period:

- Phase I – "Early Pitrén": AD 600-1000

Includes the remains of *Lama guanicoe*, rodents, birds, fish and shellfish, and quinoa-like seeds. The authors do not explicitly assign this phase to the Pitrén Complex. However, I suggest that this period of time incorporates the earliest Pitrén sites or ceramic components found on the island, including P10-1, P22-1, and the earliest layers of P25-1. For this reason I call this phase “Early Pitrén”.

- Phase II - Pitrén: AD 1000-1200

At P25-1, this phase sees otariid dominate over camelids remains in the faunal assemblage. Other animals represented include *Pudu pudu*, *Lycalopex* sp., *Oncifelis* sp., *Galictis* sp., and cetaceans; birds as *Puffinus creatopus* and *Phalacrocorax bougainville*; and fish such as *Thirsytes atun* and *Cilus gilberti*. At P21-1 a flexed burial, and modeled, negative painted ceramics (diagnostic Pitrén traits) were encountered.

- Phase III - Transition: AD 1200-1400

At P5-1, P25-1, and P31-1, this phase sees camelidsd dominate over otariid remains in the faunal assemblage, and instruments made on cetacean bones for farming and textile manufacture. The botanical remains indicate the presence of the crops *Chenopodium quinoa*, *Zea mays*, and a poaceae (*Bromus* sp., likely to have been mango). Quiroz and Sánchez divided Phase III at P21-1, into two sub-phases, with the ceramic decoration of “cuneiform incisions” distinguishing the later Transition I subphase from the earlier and underlying Transition II subphase.

- Phase IV – El Vergel: AD 1400-1685

This phase, as seen at P25-1 and P31-1 was marked by the absence of *Chenopodium quinoa*, and by the presence of *Solanum* sp. (maybe potatoe). At P21-1, the burial forms included urn burials and direct extended burials, use of ceramics with painted red-over-white geometric motifs, and recovery of silver earrings and glass beads.

The next two figures compile the above information. The Figure 3.3 presents the absolute dates (radiocarbon and termoluminiscence) and provenience for each one of the four defined phases. The Figure 3.4 serves to compare the mainland Araucanía sequence with the Quiroz and Sánchez sequence for Isla Mocha.

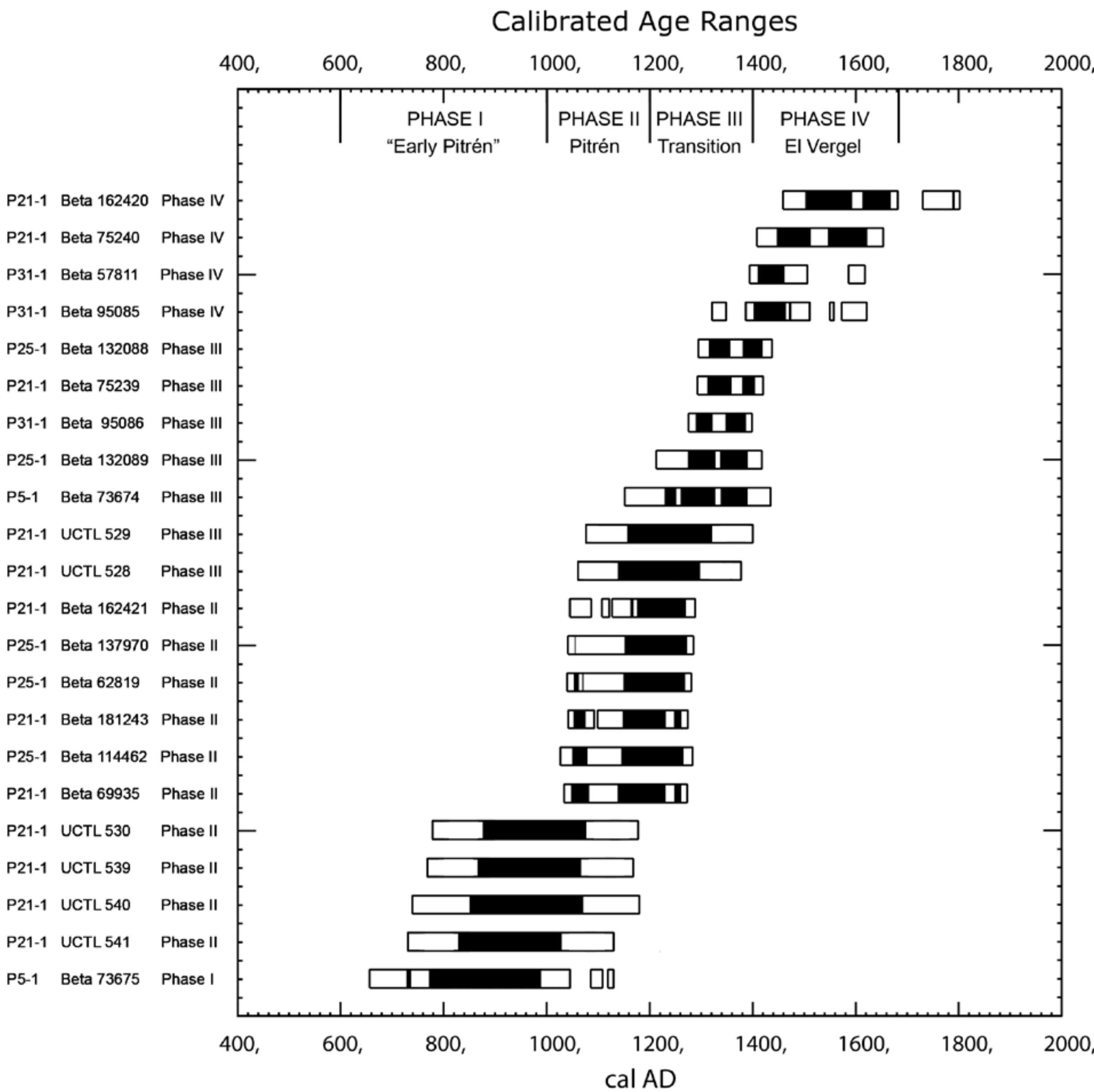

Figure 3.3 Quiroz and Sánchez sequence absolute dates

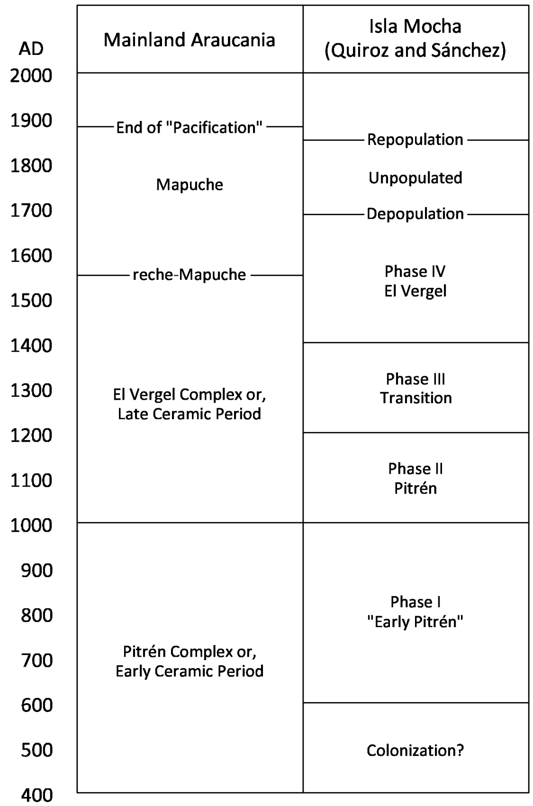

Figure 3.4 Mainland Araucanía and Isla Mocha Quiroz and Sánchez sequence

There are many inherent problems in the Quiroz and Sánchez sequence, not the least being the definition of cultural "phases" witha collection of unrelated archaeological "traits." However, the sequence does capture the findings of the previous archaeological research that point to around AD 1000 as a time marking the beginning of significant social and economical changes on the island (as this date does also on the mainland). The majority of the archaeological sites on the island were established after this date.

For my purposes, I found it useful to work within a much simpler chronological framework.

Around 1500 BC (Middle-to-Late Archaic Period), there was a short or ephemeral occupation of the island by maritime hunter-gatherers, whose material culture more closely resembles that of Northern Patagonian Channels hunter-gatherers, than that found on the adjacent mainland. Mainland mammals as *Myocastor coipus* (nutria) and *Pudu pudu* (pudu) have been recovered at these sites. After this period Isla Mocha seems to be remained uninhabited for the next 2000 years. Or, at least, the human groups that visited or occupied the island produced so light an archaeological record that it so far has not been recognized. This absence of archaeological record is coherent with a virtual hiatus of sites –and absolute dates- for the adjacent mainland and belonging to a still poorly defined Late Archaic period.

The “ceramic cultures” period (AD 400 to AD 1685) includes the Pitrén Complex, El Vergel Complex, and the reche-Mapuche. This research focuses on the last two segments of this period.

On Isla Mocha, the earliest presence for Pitrén Complex features (thin wall ceramics, modeled vessels, monochrome decoration, and negative painting, and direct burials in flexed position) is dated to AD 430±150 (UCTL 537) at the site P10-1. There are some pre-AD 400 radiocarbon dates but the archaeologists that obtained them are reticent to accept them (Quiroz and Sánchez, com. pers.). Other evidence for a pre 400 AD occupation is provided in a palynological study (Le Quesne et al 1999) that identified a charcoal layer event dating to 1760±80 BP (cal. AD 135-534; Beta 62523; charcoal; no δ13C provided). Quiroz and Sánchez have interpreted this event perhaps related to the arrival of forest-clearing horticulturalists or agriculturalists. The undated early quinoa-like seeds recovered on P5-1 site could pertain to this episode. Camelids are throught to have spread to (or been introduced to) the island at roughly the same time .

The El Vergel Complex represents the most ubiquitous and discernable archaeological record on Isla Mocha. Quiroz and Sánchez (2004) have argued that the Pitrén Complex elements disappear around AD 1200, and following a 200 year Transición (Transition) period, the full El Vergel Complex appears around AD 1400. The reche-Mapuche is arbitrarily defined as that period of time following European contact with the island (in AD 1550) until the forced depopulation in 1685-1687. The Spanish never established outposts or settlements on Isla Mocha, unlike in the Araucanian mainland and on other islands.

After 1687 the island was only occasionally mentioned in navigation accounts which agree in describing it as unpopulated. Since the late 18^{th} century it was seasonally visited by whalers as part of their navigations to the Antarctica.

The last period (AD 1850 to present) is that of modern Chilean farmers. This began when private entrepreneurs occupied the island illegally, before eventually renting it from the Chilean state. These entrepreneurs brought farmers from different parts of Central Chile as *inquilinos* and re-settled them on the island. The descendants of these residents constitute the basis of today´s population. In 1929, the Chilean State proceeded to divide the island in 32 private *parcelas*, which were given or sold to the Isla Mocha inhabitants and to state officers. The central hilly forest –with an area of 24 km^2 - remained under state control and in 1987 was formed into the Isla Mocha Nature Reserve.

4.0 RESEARCH AREA AND RESEARCH QUESTIONS

4.1 RESEARCH AREA

My research area was chosen for several reasons. The presence in the research area of a putative chiefly center (P31-1) made Isla Mocha a logical setting to investigate Araucanian leadership and social inequality. The presence in the research area of public architecture (two mounds and a sizeable platform) allows assessment of some of the relationships between ceremonial activity and leadership that Dillehay (2007) posits as essential in structuring Araucanian social inequality. Therefore, if significant economic or status differences existed anywhere on the island, we would expect to find them in this zone that incorporated the residential site of the leadership and the island's public architecture. My initial reconnaissance of the zone had also suggested the presence of possible craft specialization at P29-1, a site displaying an unusual surface concentration of local micaceous shale and quartzite, possibly related to either metallurgy and/or ceramic production. This observation hinted at potential "horizontal" social differentiation in economic foci. At the practical level, the abandonment of the island between 1685 and 1850, and the subsequent lack of much modern habitation and mechanized agriculture, left a well preserved and relatively visible surface archaeological record.

The research zone consists of a 6 km² area (roughly 4.5 x 1.4 km) (Figure 4.1, 4.2, 4.3, and 4.4.) centered on the site of P31-1 on the northeastern side of the island. The zone is bounded to the west by the *Reserva Natural* and the margin of the upland forest, to the east by the Pacific Ocean, and to the north and south by the fences dividing, respectively, *Parcela* 28 from *Parcela* 27 and *Parcela* 5 from *Parcela* 6. The mounds, first noted in my 2007 pilot project, are located 1.5 km north of P31-1. So far, they are the only known mounds on the island, standing about 2.75 m tall.

Figure 4.1 depicts Isla Mocha. My research area is indicated in gray, the El Vergel archaeological sites are represented following the area assigned by Quiroz (2003b); elevation curves are at 50 m intervals

Figure 4.2 depicts my research area. The solid blue line is the coast. The solid red line marks the boundary of my research area, which to the west marks primarily the separation between the thick forest (unsurveyable) and the cleared areas (surveyed). The dot-dashed green line marks the boundary between the *parcelas* and the *Reserva Natural Isla Mocha*, and the solid green line the limits between *parcelas*. The black dashed lines correspond to streams, the one north of P31-1 is the Camino Nuevo stream. The sites are depicted following the area assigned by Quiroz (2003b).

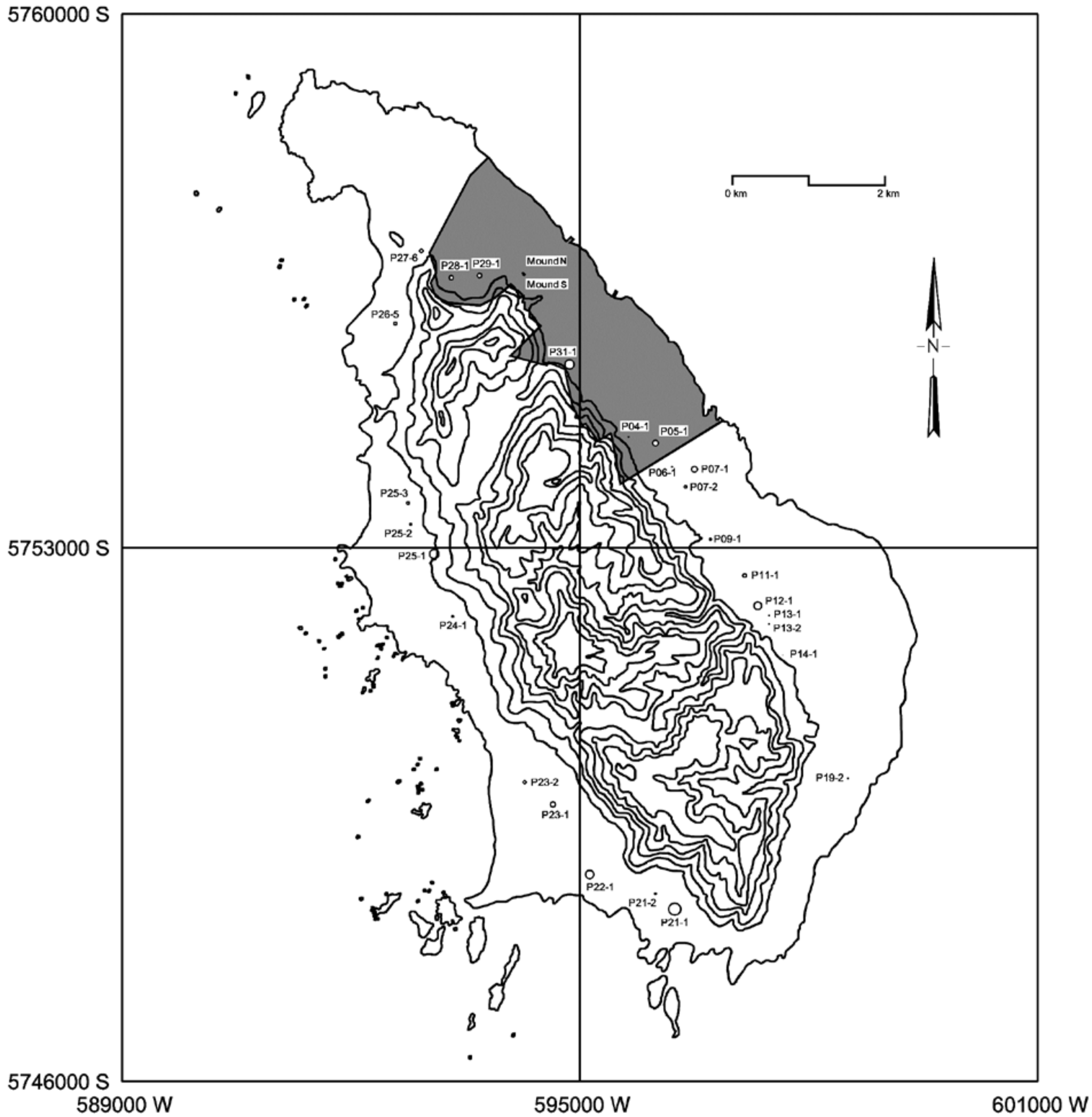

Figure 4.1 Isla Mocha

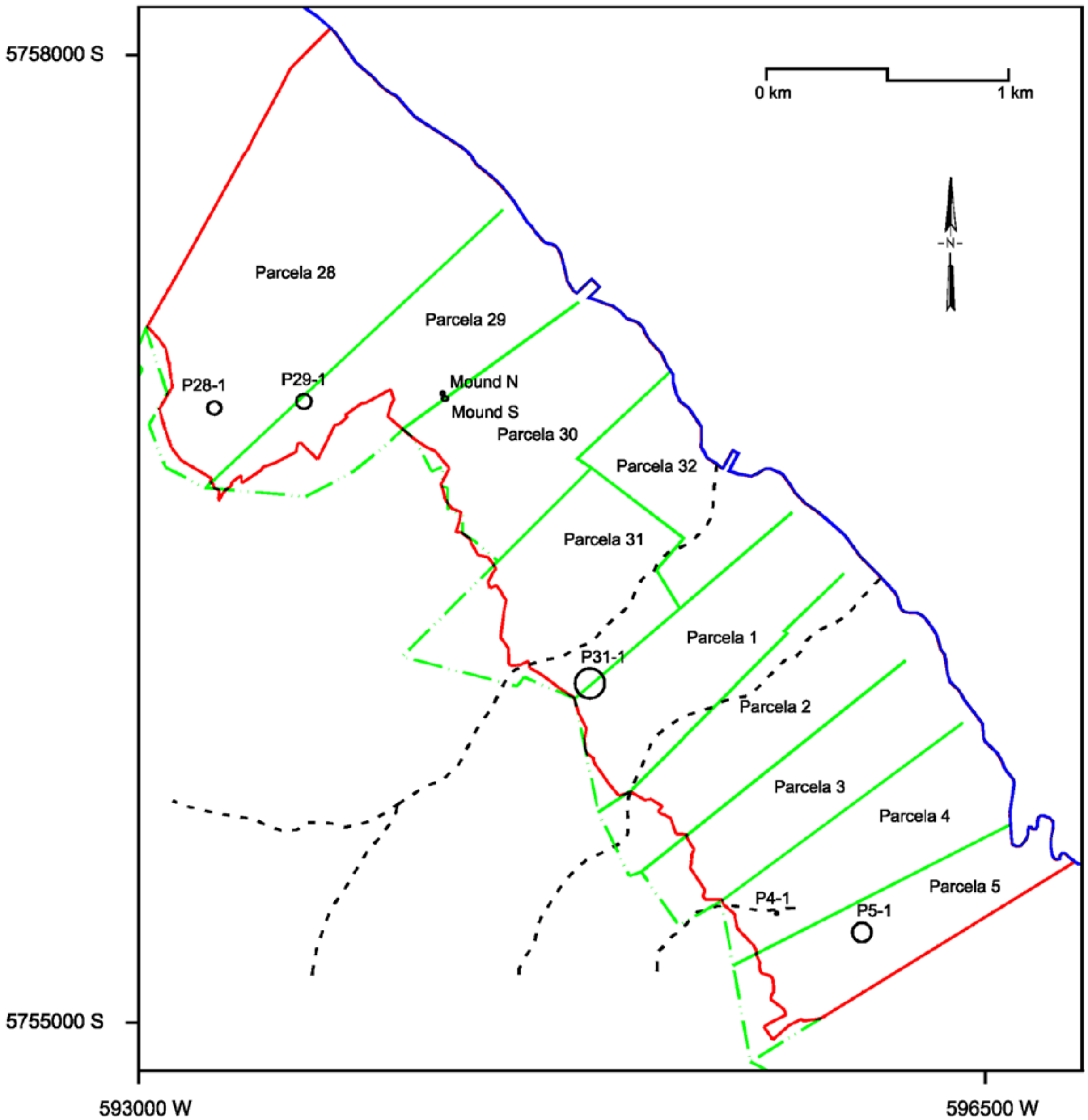

Figure 4.2 My research area on Isla Mocha

Figure 4.3 is an aerial view of my research area, oriented to the SW. The blue line corresponds to the Quebrada del Camino Nuevo stream, which cross site P31-1. The north limit of my research area fall outside the photograph. It is also indicated the ancient landslide that closed to the south the area where the mounds are located.

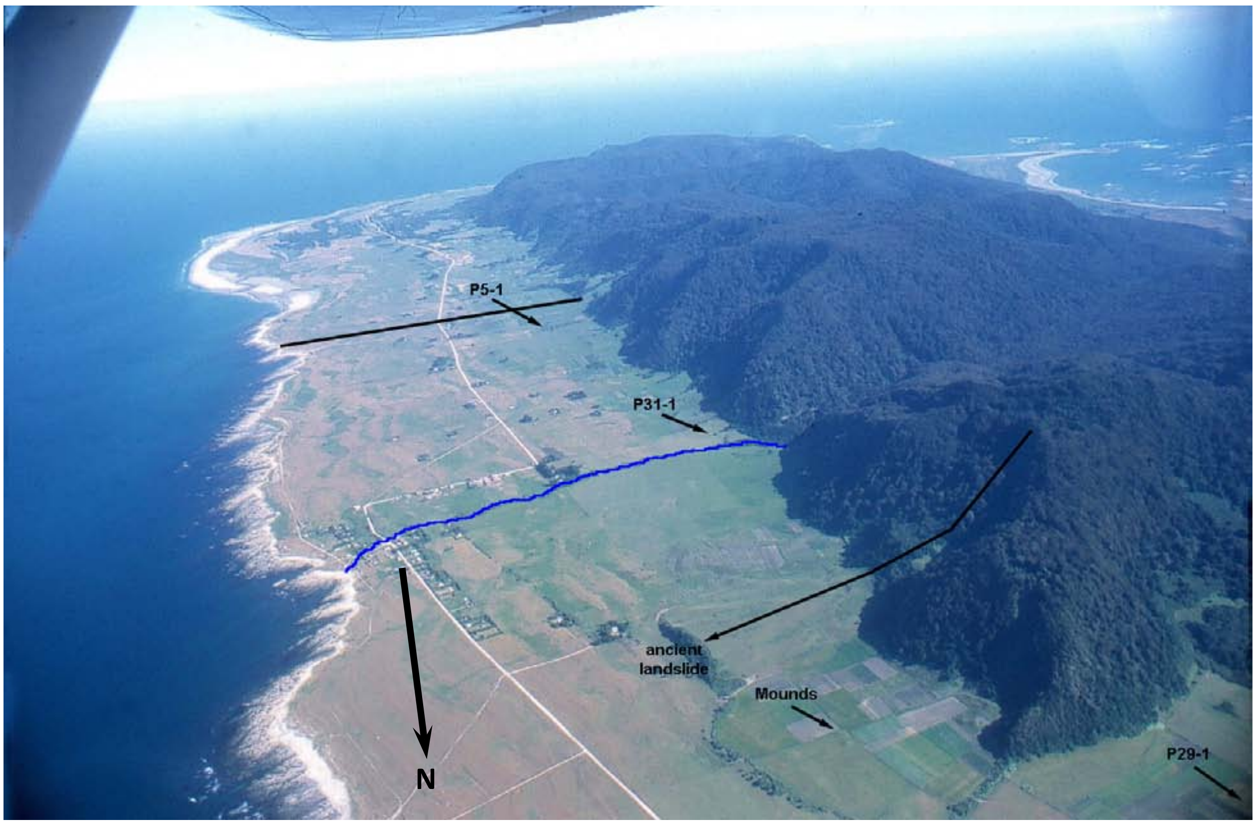

Figure 4.3 Aerial photograph of my research area (Horacio Parregué photograph)

Figure 4.4 is an aerial photo of Isla Mocha, oriented to the SW. The blue line corresponds to the Quebrada del Camino Nuevo stream, which cross site P31-1. The green line corresponds to the path, through the forest and central range that connects the eastern and western sections of the island.

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Figure 4.4 Aerial photograph of Isla Mocha (Hozdiamant photograph, http://www.flickr.com/photos/hozdiamante/510949067)

4.2 ASSESSING SOCIAL DIFFERENTIATION AT ISLA MOCHA

As discussed in Chapter 2 , information on Araucanian household status and wealth has to be gleaned from ethnohistoric observations, rather than from archaeological research. Such ethnohistoric or ethnographic information is most useful archaeologically in: (1) providing clues as to the basis of leadership and the nature of household differences most likely to be found in Isla Mocha during the El Vergel Period; and (2) identifying the most relevant material correlates for household status and wealth differentiation.

4.2.1 Craft Production Items

A potential line of evidence in recognizing wealth differences, or existence of an elite political economy, is that of metal objects (Campbell 2004). Metal-working (or at least the circulation of metal objects) is associated with the El Vergel Complex, although metal objects were recovered from the late Pitrén cemetery of JMC-1 (Adán and Mera 2011). El Vergel metal objects remain rare from Araucanian contexts - only about 200 have been recovered for the whole of Araucania. These artifacts consist largely of copper items of adornment, mostly earrings. Copper items have a wide distribution in Araucania, where they have almost exclusively been recovered from graves. In the very few reported cases where skeletal remains were preserved, the evidence indicates that metal grave goods generally occur with female burials (as well as with some infants, to which sex cannot be assigned).

The two most common shapes in metal earrings are quadrangular-notched and flat-circular. The former have been recorded throughout all of Araucania, and occur in urn, cist, hollowed trunk, and direct burials. In contrast, the circular form was more restricted to the coast – Isla Mocha included. To date, no circular earrings have been found in an urn burial. Beginning in the 18th century, native production and circulation of silver objects increased, constituting a new and completely different metalworking tradition (*Platería Mapuche*) from the prehistoric/early historic tradition. Again, the emphasis was on small items of adornment for women (and horses). *Platería Mapuche* has not been found in funerary contexts, in clear contrast to the El Vergel pattern.

Specific information on the procurement of ore, production, and circulation of these metal items is currently lacking. The known sources of copper and silver ore in the entire El Vergel territory are restricted to just one area around Tirúa. Of course ore could also have been obtained through long-distance exchange and used for local production. To date, the only sites in Araucania with evidence of metal smelting (slags) are P12-1 and P31-1 on Isla Mocha.

Another archaeological correlate of relatively high status or wealth is high proportions of higher-value pottery. The most relevant and distinctive ware in this regard is the painted Red

Over White ceramics. Like urn burial, the use of this ware is a horizon marker for the El Vergel Complex. Red Over White pottery is most common in funerary contexts, including used for burial urns, and is relatively rare in domestic (or at least non-funerary) contexts.

Higher household wealth may also have been associated with proportionally greater use of more desirable raw lithic material for stone tools, including obsidian or silex. Higher value materials would have been igneous rock from the Andean cordillera, rather than the locally available stone.

Differential involvement in textile production and/or camelid herding may also have been a "wealth strategy" of higher status or leadership households. Araucanian sites have yielded the artifacts (spindle whorls, needles, awls) associated with fiber working, and camelid wool textiles have also been recovered, although the source of the wool has not been determined. Whether domestic camelids were kept in prehispanic times is one of the major issues of contention in Araucanian archaeology. Wool could have been obtained from wild camelids (guanaco), and the only camelid bones yet identified in archaeological contexts are from guanaco. It has been suggested that Isla Mocha may have been a location where guanaco were managed or "tamed" (*aguachado*) (Becker 1997). Balancing this are the early ethnohistoric accounts that suggest that along with guanaco, there was another camelid. Those sources mentioned it as *hueque*, *rehueque* or *chilihueque* in Mapudungun language; *oveja* or *carnero de la tierra* in Spanish (sheep or goat of the country); in Mapudungun the word for guanaco is *luan*. The accounts describe then an animal with long wool, and notes that the indians made their cloth from it, that the animal served as a pack-animal, and was even used for plowing. However, most archaeologists are inclined to disregard the presence of a domestic camelids -*Lama glama* (llama)?, *Lama pacos* (alpaca)?- in Araucania, and considered that what the chronicles describe, and the natives called *chilihueque*, are "tamed" guanacos. Whatever the animal, more relevant is the important social value accorded to the *hueque*. The *chilihueque* was sacrificed as part of different rituals and its meat was consumed only in special occasions. This animal was also useful as a payment in death compensation and bride price goods. Sources mention that this camelid was kept only in small quantities, these being owned only by *caciques*, suggesting its prominent position in chiefly political economy for both its wool (wealth production strategy) or meat (staple production strategy). The last references to the *chilihueque* come from the 18th century. Its disappearance has been linked arrival of European horses and sheep. The political economic value of the camelids may have intersected with the domestic economy of leadership or higher status households. Women are described by European observers as the exclusive manufacturers of textiles, as was the capacity of *ulmen* to have as many wives as could be afforded.

Another category of object mentioned in the ethnohistoric sources as a prestige item were small, greenish stone beads, called in Mapudungun *llancas*. The range of native rock able to fit this description is wide (apatite, fluorapatite, amazonite, serpentinite, several copper-bearing minerals as malachite, chrysocolla, turquoise, among others; Bar-Yosef and Porat 2008), and there are no real indicators of how ubiquitous these beads were in Araucania. Their described use was similar to that of the camelids, including payments, death compensation, and bride price. According to the chronicles, they were used by women and the *boquivoye* (the *lebo*'s religious leader).

Archaeologically, beads of any type are rare at Araucanian sites. Black and white beads stone beads were found in an urn-hollowed trunk burial in Padre Las Casas, shell beads in the La Candelaria cemetery, and, at Isla Mocha, green stone beads have been found in the fields by farmers (D. Quiroz pers. com). In historical times, glass beads brought by the Europeans were circulated. At Isla Mocha, two glass beads were found in a direct burial in P21-1 site, and near Cañete, a funerary urn contained more than a hundred of these, probably part of a necklace.

Political insignia described in the ethnohistoric accounts include special stone axes (*toqui* or *toquicura* in Mapudungun, *toqui*=military leader, *cura*=stone). According to Boccara, the *genvoye* or peace-time chief carried a white *toqui*, while the *gentoqui* or military chief, a black *toqui*; indeed these insignia were mutually exclusive to the point that when one of them was displayed, the other one was kept hidden. Among the prehispanic stone axes are *clavas cefalomorfas* (a circle representing a stylized bird head with a handle), and these may have been associated with chiefly status. These insignia were passed from father to son, although the *gentoqui* was allowed to transfer his axe to a different individual during times of war. Other axes served more utilitarian purposes. These included a stone adze-like blade. Archaeologically, few "stone axes" of any kind have been recovered from excavations, although museum deposits in Chile are full of them. The adze-like tools were quite probably used for wood working and/or other hard work. In the case of Isla Mocha, there is no local rock that would be appropriate to produce these artifacts, and the adze-like stones found in the fields by the farmers represent imported material from the mainland.

Drinking vessels and objects (flutes, beads) made of human bone are mentioned in the earliest chronicles, along with anthropophagic practices. According to Boccara (2007), there were severe prohibitions against killing and eating members of one's own *ayllarehue*. There was no such prohibition for individuals of other *ayllarehue*, and the famous skull vessels were made from the remains of famous, respected, and courageous rival remains. For example, the skulls of Pedro de Valdivia and Martín García Oñez de Loyola, the two *Gobernadores* killed by the natives, in 1553 and 1598, respectively, are said to have been transformed into decorated vessels to drink chicha, and kept and used by prestigious *cacique*. Indeed, in 1608 these two skulls were returned by Pelantaro, himself an important *cacique* and leader of the 1598-1604 uprising, to the then *Gobernador* Alonso García de Ramón, as a sign of peace. Use of human bones and the anthropophagic customs associated with them disappeared during the 17th century, and so far, archaeologically nothing resembling these items have been found in Araucania.

We might also expect leadership or higher status households to have been differentially involved in trade items in general. Early ethnohistoric accounts mention the islanders exchanging digging sticks, mutton, and *chilihueque*, for mainland axes, wedges, beads, and indigo. In the case of Isla Mocha, as an island, the mainland was not easily accessible, requiring a journey of roughly seven hours. The ethnohistoric sources indicate that boats or rafts were made of *maguey* (probably *Puya chilensis*). According to Rosales (1877:172) these vehicles had a capacity of about 30 people. External ties could thus easily have been controlled by elites or leaders, and ethnohistoric accounts note the presence of *caciques* as passengers, and frequently reference their direct participation in trading expeditions. Suitable landing sites on the island are limited, and chiefs may have been able to dominate trade with the mainland by living at such locales.

Another activity associated in ethnohistoric accounts with leadership and ceremonial practices was large scale production and consumption of chicha. Although chicha was described as being produced by the females and children of any native household, the chronicles are clear about its importance in leadership activities. *Ulmen* were in charge of providing the chicha for the feasting or ceremony they organized. As Boccara (2007) puts it, "a feasting [*fiesta*] without chicha is not a feasting, and that an *ulmen* without chicha is not an *ulmen.*"

The most common chicha was made from *Zea mays* (maize), but various authors (Pardo and Pizarro 2005b) also describe the production of a fermented beverage from *Alstroemeria ligtu* (liuto), *Amomyrtus luma* (luma), *Araucaria araucana* (pehuen), *Aristotelia chilensis* (Chilean wineberry), *Berberis* sp. (michay), *Bromus mango* (mango), *Cyttaria* sp.(dihueñ), *Muhlembeckia hastulata* (quinoa), *Fragaria chiloensis* (Chilean strawberry), *Gaultheria* sp. (chaura), *Lithra caustica* (litre), *Luma apiculata* (shortleaf stopper), *Muhlembeckia hastulata* (quilo), *Pernettya* sp. (chaura), *Peumus boldus* (boldo), *Prumnopitys andina* (lleuque), *Rubus* sp. (berries), *Schinus polygamus* (huingán), *Solanum tuberosum* (potatoe), and *Ugni* sp. (Chilean guava). Of these, *Fragaria chiloensis*, *Aristotelia chilensis*, *Zea mays*, *Muhlembeckia hastulata*, *Muhlembeckia hastulata*, *Solanum tuberosum*, and probably *Bromus mango* have been found at Araucanian sites, and Isla Mocha has yielded remains of *Peumus boldus*, *Aristotelia chilensis*, and *Amomyrtus luma*.

4.2.2 Household Size

It is not uncommon cross-culturally for leadership households or higher status households to be larger than others. The native society described in the chronicles is patrilineal, patrilocal, and strongly patriarchal. The number of women in a household (both wives and daughters) reflected its status in society, as well as providing a larger domestic labor capacity than single wife households. As noted, female domestic labor was of particular import in production of textiles and chicha. It is interesting that the ethnohistoric sources suggest that households displayed status or wealth through adornment of women (and later on of horses), as it is women who are mentioned specifically as wearing beads and copper ornaments, and, in later historical times, the sophisticated silver pieces.

From ethnohistoric sources (Boccara 2007), it is also clear that was a key for chiefs, or for any individuals pursuing leadership positions, was to have many daughters because these provided the means of establishing alliances. In traditional Araucanian social relations, the husband would be in debt to the wife-giver, and obligated to support the wife-giving household in its economic, warfare, and social endeavors. In this manner, chiefs could develop not only a large (and productive) family, but also a vast network of families related to him.

Additionally (Dillehay 2007:227, 348-349, 356-357), makes a strong argument that a key to the power of the Araucanian chief was his ability to attract around him a large amount of followers, which in some cases belonged to defeated or displaced lineages in the due to clashes with the Spaniards. In this way, a key aspect of chiefly authority, the capacity for being a successful leader, consisted of preventing the leakage of these followers and, in turn, gaining new ones. These mechanisms worked in a reinforcing fashion, helping to consolidate even more the position of an important chief. However, there was also always the chance of a disruption in this situation, and with a chief's followers and affines relinquishing their previous obligations and moving (physically) to be associated with another leader.

4.3 RESEARCH QUESTIONS

The overall objectives of this research were to reconstruct the El Vergel settlement pattern on Isla Mocha, and, through comparing artifact assemblages from different settlement loci, to investigate the nature of El Vergel social vertical and horizontal social differentiation.

(1) Was there significant household variability in wealth?

Dillehay (2007) and others have argued that Araucanian social inequality was not based on, or expressed in, wealth accumulation, and that leaders were not differentially involved in wealth finance activities.

If, contrary to Dillehay's reconstruction, marked household wealth differences existed, we would expect some residential contexts to exhibit higher relative proportions of: high value materials (decorated pottery, adornments, ceremonial stone axes), imported materials (semi-precious stones, glass beads, exotic lithic raw material, European ceramics), and/or preferred dietary items (camelid bone). One area of wealth variability would be in source material for stone tools, with preferred obsidian and siliceous rocks representing imports as opposed to the local quartz, basalt, and sandstone (Jackson 1997).

Given that Isla Mocha is an island, it is reasonable to expect that domination of long distance trade, or of ties with the mainland, was an important basis for higher status or political leadership. If this were the case, I would expect to see differential proportions of non-local items among the residential loci.

(2) How important was communal ritual and feasting in Isla Mocha social inequality? Were high status or leadership households differentially involved in ritual and feasting activities, or even spatially associated with the mounds?

The proportion of serving vessels is one archaeological correlate for feasting/serving activities.

Finding that some residential loci display significantly higher proportions of serving vessels would be consistent with Dillehay's hypothesis that leadership rested on feasting, and the "skillfull manipulation of excess food" (2007:349), rather than on wealth accumulation or domination of staple production. If ceremonial leadership was a basis for social hierarchy, I expected to find higher status or leadership households to be located adjacent to ceremonial areas (such as the mounds); and perhaps to display a higher relative proportion or range of ritual paraphernalia (such as ceremonial axes).

Previous archaeological research in Araucania suggests that residential occupation was generally not directly adjacent with mounds (Adán and Castro 2001); the nearest domestic areas were generally several hundred meters away. However, some mounds have exhibited adjacentplazas or open areas used for ceremony and offerings (Dillehay 2007), and residences may have been built adjacent to these features, rather than the mounds proper. This relationship was tested for Isla Mocha through the surface collection and off-mound excavation intended to reveal if residences (perhaps of leaders or an elite) were associated with the two mounds in the research zone.

(3) Is there evidence for "horizontal differentiation" in the form of economic specializations or emphases? If so, how does this variability relate to status/wealth distinctions?

To assess household economic variability, I looked for differential involvement in: (1) agriculture (as seen in the relative proportion of grinding stones and stone or whale rib hoes); (2) stone tool production (as measured in proportions of different types of cores and flakes); (3) weaving (awls, spindle whorls); (4) bone tool production (as indicated by blanks and discard), and (5) metallurgy (manifested in ores or slags). Variability in these household economic emphases will reveal the extent to which Araucanian communities were interdependent, and integrated by economic relationships (horizontal variability), in addition to any political ones. If any of these economic specializations paralleled status/wealth variation at P31-1, it would indicate that social hierarchy was associated with differential involvement in economic processes such as exchange, craft production, or staple production.

4) How does P31-1 differ from other sites? Did the population nucleations function as centers? That is, do these sites exhibit activities or categories, of occupants, not found at other settlements in the research zone, suggesting that the sites functioned as central places?

If P31-1 was the chiefly center, I expected to find evidence for high status and/or wealthy residents there. Differential proportions of status/wealth indicators might characterize P31-1 as a whole, or be limited to certain sections of the site. I also sought to investigate if P31-1 was functionally different from other settlements in other ways. Were the residents there more involved in trade, ceremonial activities, or particular types of craft production? To assess this, I needed to examine relative proportions of nonlocal materials, ritual items, and craft production correlates. If the three sites (P31-1, P29-1, P5-1) turned out to be very similar, it would suggest a political situation quite different from the centralized chiefly settlement system described in some ethnohistoric accounts. If these communities were isomorphic with one another in size, residential density, and artifact assemblages, it would suggest that each was relatively autonomous socially and economically. This finding, in turn, would suggest if there indeed was a paramount chief at P31-1, the centralizing effects of this office were very weak.

(5) Was there significant population aggregation on Isla Mocha? If so, was aggregation around higher status or leadership households, consistent with the processes emphasized by Dillehay (2007) as critical to Araucanian political leadership? Were such households or homesteads larger than others? Is there evidence for spatial divisions in status within population nucleations like P31-1?

Population nucleation around political leadership has been hypothesized as an important feature in chiefly societies (Carneiro 1998, 2002; Drennan 1987; Feinman 1991). This process is relevant to understanding Araucanian chiefly dynamics, where control over people is argued to have been more important in chiefly authority than wealth accumulation or control over land (Dillehay 2007:344, 354). In Dillehay's (2007) construct, in which, through settlement fragmentation and nucleation, dominant, intact lineages recruited outsiders to create, "larger and more aggregated communities" (Dillehay 2007:365). If this were the case, then we could expect to P31-1 to exhibit, in comparison to other sites, a more nucleated settlement or higher residential density (as measured in surface artifact densities and less space between those surface patterns likely to correspond to houselots or individual household middens).

Ethnographic and ethnohistoric information emphasizes that patrilineages were the basic unit of Araucanian society, and that important settlements were occupied by "residentially fixed" lineages (Dillehay 2007:313, 337). In Dillehay's (2007) construct, centralization in leadership stemmed from the competitive interaction of these lineages. Despite the great importance of lineages as political and corporate groups in Araucanian society (Faron 1964; Dillehay 1990, 1992b), we do not yet know if these lineages are recognizably archaeologically as discrete settlement units or intrasite clustering. Therefore, one of my goals was to document surface artifact patterns in P31-1 to reveal possible suprahousehold residential divisions, and any wealth, status, and economic differences corresponding to these spatial divisions. For example, was there a dominant cluster (in size or wealth?) within P31-1? One hypothesis at the beginning of the project was that the artifact concentration designed P31-1 represented a central group of homesteads at the core of a chiefly settlement cluster. As such, it was a strong candidate to be the residences of the dominant lineage or leadership families. Dillehay (2007) has argued that local lineages recruited outsiders to settle in close proximity. If so, then this process may be visible at P31-1 as clusters of homesteads (each representing a local kin unit), surrounded by more dispersed, "attached" immigrants.

(6) I did not have great expectations about being able to recognize temporal trends using surface materials, given the nature of El Vergel and reche-Mapuche pottery. Nonetheless, through test excavations, I had the ambition to reconstruct the timing of demographic shifts, monitor changes in serving activities, determine when the mounds were constructed, and assess the evidence for intensification of agriculture (in agricultural implement proportions). Doing so would allow testing at Isla Mocha of one of the central themes of Dillehay's (2007) construct: that as there an association of population nucleation, agricultural intensification, mound building, feasting activities, and the emergence of chiefly power

If I find that these developments singled out by Dillehay were not concomitant, or that stratification emerged without them, or that these developments did occur, but were not associated with stratification or the development of strong political hierarchy, it would indicate that these processes *need not necessarily have related to one another* in the way Dillehay argues for the Puren-Lumaco area, and thus should not be treated as universally important in explaining Araucanian sociopolitical dynamics.

(7) As noted in previous chapters, most reconstructions of Araucanian sociopolitical development highlight the role of European contact in stimulating social stratification and political hierarchy. However, these reconstructions are based almost exclusively on ethnohistoric accounts rather than archaeological investigation, and thus can only deal with the later time periods in Araucanian history. My research, by comparing settlement and domestic assemblages from the El Vergel (AD 1000-1550) and "reche-Mapuche" (AD 1550-1750) period, also aimed at providing an archaeological test of this hypothesis.

5.0 METHODOLOGY

5.1 FIELD METHODS

My pilot research conducted on Isla Mocha in 2007 and 2008 had shown artifact scatters of varying densities and sizes across the research zone. This pattern, together with ethnohistoric accounts, strongly suggested a residential pattern of dispersed homesteads, rather than tightly nucleated villages. Such a settlement pattern is consistent with Dillehay's (2007) characterization of Araucanian settlement as, "decentralized settlement of dispersed households occupied by kin-based groups of chiefs and commoners", with more nucleated settlement developing around, "mound-building, incipient agriculture, public ritual, and partly centralized leadership in rich and geographically circumscribed valleys" (Dillehay 2007:275).

The dispersed homesteads, poor preservation, structues of perishable materials, and lack of architecture visible on the surface, argued against using traditional techniques of broad horizontal excavations to investigate household units. In addition, modern agriculture, rain, and wind have created an active, uppermost soil stratum with readily visible archaeological materials. Given these characteristics, intensive surface collection complemented with test pitting, seemed the most effective field strategy. Similar methodologies proved very successful in studying settlement patterns and household variability in other areas that lack compact settlements, such as in China and Colombia (Chifeng International Collaborative Archeological Research Project 2003; Drennan 2006; González 2007; Peterson and Drennan 2005; Quattrin 2001).

Hence a three-stage field methodology was implemented. The first stage consisted of survey and surface material collection of the entire research zone. The second stage was intensive surface collections of selected loci. The third stage was test pits excavation within selected sites.

5.1.1 First stage: The survey and surface collections

The goal of this stage was generate an understanding of the density and distribution of occupation across the 6 km² research zone. “Hotspots” of artifact density would indicate the location of dispersed homesteads or houselots (or at least their associated middens), with larger concentrations of higher density marking population nucleations. Systematic survey and surface collection consisted of walking parallel transects spaced 25 m apart over the entire research area. These transects followed a rather southeast-northwest orientation, from the forest margin to the high tide line, within each one of the *parcelas*.

When artifacts were encountered, the locus was recorded with a GPS unit, and a sample of up to 40 artifacts was recovered in a 1m radius (3.14 m^2) circle. If the unit did not hold 40 artifacts, the unit was expanded first to a 1.5 m radius circle (7.07 m^2), and finally to 1.75 m radius circle (9.62 m^2), in order to reach that number. If, after the third circle the 40 artifacts goal was not reached, we moved to the next collection point. That next collection point – if remains were present – was located 25 m away in the same transect from the previous collection point. If remains were not present, we kept walking until finding remains again readily visible on surface.

5.1.2 Second stage: Intensive surface collections

The goal of this stage was to collect material that allowed comparative characterization of different occupational loci identified through the survey. Although my hope was to find sufficient surface material to compare dispersed homesteads or houselots, as it turned out, the loci of high artifact density corresponded to the P31-1, P29-1, and P5-1 sites.

At selected sectors within each one of these “larger concentrations” (sites), a grid of 2 x 2 m units was laid out, and the surface layer (down to a depth of 2 cm) raked or “combed,” with the collection of all materials. As, mentioned, modern plowing (down to 20-30 cm) has created an active uppermost soil, one the one hand, scattering or spreading surface materials, but on the other hand, bringing materials to the surface, mostly corresponding to the last period of native occupation (the focus of this research). Terrain that could not be intensively collected included fields in cultivation, and areas, mostly two to three year fallow fields, of heavy brush cover. I do not feel exclusion of these cases signficantly shaped survey results.

5.1.3 Third stage: test pit excavation

The goals of this work were to: (1) generate larger artifact assemblages, particularly from earlier and/or deeper occupations underrepresented in the surface collections; (2) provide chronological information through C14 samples and a strategraphic framework for creating a ceramic sequence; (3) check surface-subsurface relationships; and (4) provide material for paleobotanical and faunal studies not likely to preserve on the surface.

Inside the areas delimited as sites by the contour maps generated from the survey, a grid of 50 x 50 cm tests pits was distributed, with each test unit spaced 100 m apart. The test pits were excavated in arbitrary levels of 10 cm. If some stratigraphic differences were noticeable within those 10 cm, the layers were correspondingly subdivided.

Additionally, a 35 x 35 cm flotation column was obtained for each site. This column was located adjacent to a test pit that presented both deep occupational stratum as well as combustion material (ash, charcoal, hearths). These units provided, therefore, the best chance for the preservation of charred macroremains, along with associated relative chronological information. These columns were excavated following arbitrary levels of 5 cm. For this reason, I followed the 10 cm levels already defined in the test pit, but further subdividing the flotation strata into “A” and “B”; for example, Level 5 (40-50cm) in the test pit, became 5A (40-45 cm) and 5B (45-50 cm) in the flotation column.

Finally, a trench was excavated at the “North Mound” on the mounds complex. A 35 x 35 cm flotation column was also obtained from the original paleosol buried beneath the mound.
Unfortunately, my fieldwork in this third stage was interrupted by a completely unusual rainy season at the beginning of the excavation fieldwork, and then by the 8.8 Richter degree earthquake and tsunami that hit central-southern Chile in February 27th 2010, modifying the timing allocated for this stage and ultimately ending it. For example, this situation prevented the excavation of test pits at P5-1 and of augering cores around the mound complex.

5.2 MATERIAL ANALYSIS

5.2.1 Ceramics Analysis

As expected, pottery fragments were the most abundant and ubiquitous remains recovered in my fieldwork. No complete vessels were found. The ceramic analysis followed a methodology in which each sherd was analyzed independently and classified or scored according to the following:

- Sherd type (base, body, handle, neck, rim, or union). Where possible, diagostics were used to infer vessel form.
- External and internal surface treatment (Smoothed, Fine Smoothed, Burnished, or Polished). A category of "Not Observable" was for cases in which erosion did not allow a proper assessment of surface treatment or decoration.
- External and internal surface color (Black, Brown, Cream, Grey, Orange, Red, and White).
- Sherd thickness (measured in mm, ranging from 2.88 mm to 22.96 mm, with 5 thickness groups: very thin (under 4.24 mm), thin (4.25 to 7.24 mm), medium (7.25 to 10.24 mm), thick (10.25 to 13.24 mm), or very thick (over 13.25 mm). In the case of the handles two measures were taken, one for the handle thickness, and the other for the vessel wall thickness if part of it was attached to the handle.
- Decoration (Slipping, painting, and incisising were identified, with slip and paint colors including Black, Brown, Cream, Grey, Orange, Red, and White).
- Manufacture marks (fine scraping or *cepillado*, hard scrapping or *espatulado*, and wheel marks).
- Firing (Complete Oxidizing, Incomplete Oxidizing, Complete Reducing, and Incomplete Reducing).
- Erosion (High, Medium, and Low).
- Wear marks (repair holes, sooting or fire-blackening, and creasing or *craquelado*).
- Postdepositional marks (from rootlets and grooves or *surcos*).
- Temper types (Basalt, Graphite, Grog, Pebbles, Quartz, Sand, Shells, and Siliceous Rocks (Silex). These were combined in different proportions in each sherd, and most sherds had more than one temper. The most common tempers were sand, pebble, and shell, followed by basalt and quartz.

- Mica presence (High, Medium, and Low)
- Paste color (Brown, Cream, Grey, and Orange).

One analysis was of the distribution of temper types across the research zone, within sites, and through time in excavated assemblages. It was hoped this analysis might provide information on patterns of variability in ceramic production, such as whether discrete ceramic production/distribution spheres might have existed in the research zone.

There are several difficulties in analyzing ceramic materials from Isla Mocha. There is currently no useful, or even agreed-upon, ceramic typology. Isla Mocha pottery changed very little (in manufacture and style through time. Surface collection revealed that decorated materials formed a very small percentage of the ceramic assemblage; I essentially had to deal only with plainwares. The form inventory in the pottery assemblage proved also to be very limited. These latter characteristics, of direct importance in comparison of ceramic assemblages among loci, made it particularly difficult to discern potential interhousehold wealth, status or activity differences.

As a result, my analysis makes use of a "finishing investment index" to measure the labor investment or “value” of pottery. The index scores the surface treatment and decoration techniques of each sherd, assigning a numerical value to the sherd. The means/medians of the summed scores in an assemblage can than be used to make comparisons between levels, test pits, and/or sites. This index is similar to one proposed by Costin (1986:251-260), Hagstrum (1988; 1989:248-270, and Costin and Hagstrum (1995:630-31), which in turn, build upon a method proposed by Feinman et al. (1981). However, their analyses differ from mine in several relevant aspects.

Costin and Hagstrum (1995) began with an operative ceramic typology, having knowledge of the range of forms and wares present in their assemblages and of the ceramic attributes that characterized these vessels. Given this, they were able to devise values for each production step, and then, using complete and typed vessels, assign a summed value to each part (rim, neck, shoulder, body, base, handle) of that vessel. Next, they summed up those part values, to generate an overall value for each ceramic vessel (Costin and Hagstrum 1995:Table 3 and Figure 6, included below as Figures 5.1 and 5.2). With this figure, they could quantitatively characterize a ceramic assemblage, by assigning values to individual sherds, using the ceramic type as their unit of analysis.

Table 3. Production Task Index Points.

Task	Points
Primary formation (points for each side)	1
Evident—coiled	2
Evident—rotated	3
Secondary formation (points for each side)	0
Not evident	1
Evident—wiped or scraped	1
Obliterated	2
Handles—formation	
Coiled	1
Pulled	2
Handles— attachment	
Simple	1
Plug	2
Finishing— application (points for each side)	
Slip or wash (each color adds 1 point)	1
Finishing— modification (points for each side)	
Pebble smoothed	1
Burnished	2
Polished	3
Finishing—plastic decoration[a]	
Simple incision	1
Complex incision	2
Simple applique	1
Complex appique	2
Finishing— paint (each color adds 1 point)[a]	
Simple motif	1
Complex motif	2

Note: Scoring after Hagstrum 1989:Table 6.5.
[a] Noteworthy skill adds 1 point.

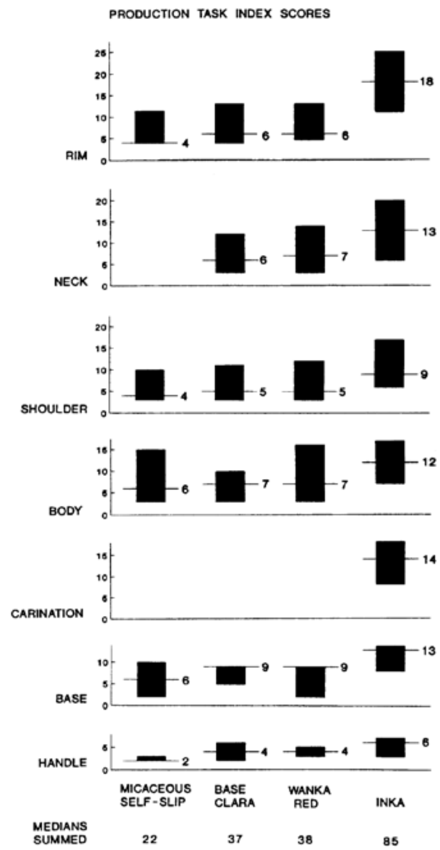

Figure 6. Production task index scores on Micaceous Self-slip, Base Clara, Wanka Red, and Inka body parts. Vertical bars indicate range of scores, while horizontal lines indicate median score for each ware/body part.

Figure 5.1 Costin and Hagstrum 1995: Table 3

Figure 5.2 Costin and Hagstrum 1995: Figure 6

In my analysis, lacking meaningful information on vessel form (and often size), I had to use sherd characteristics alone in the analysis. My rationale for this approach is that differing amounts of time and labor investment devoted to the surface treatment and decoration of vessels had some connection to the value of those vessels. A vessel with more elaborate (polishing, slipping, and decoration for example), represents a great time/labor investment than a vessel lacking these attributes. In many archaeological cases, high value pottery is highly finished, and decorated, often in polychrome. An assemblage with a higher summed value would thus be one that reflected pottery of more elaborate finish and greater production effort.

Costin and Hagstrum's (1995) analysis examined five steps ceramic production sequence: (1) resource procurement; (2) materials preparation; (3) vessel forming; (4) vessel finishing; and (5) vessel firing. The first two and the last stages are difficult to assess archaeologically, and therefore were not considered in their analysis (or in mine). Given the relatively few diagnostic sherds in my collections, vessel forming tasks were not useful in scoring the assemblages. Thus, this left surface treatment and the decoration ("finishing") as the only variables out of the two archaeologically visible ceramic production steps, to be useful in my case. This was the only approach capable of uncovering potentially meaningful variability among the otherwise very similar ceramic assemblages recovered from the Isla Mocha surface collections. The scoring system I followed is outlined in Table 5.1.

Table 5.1 Ceramic investment scoring system

Task		Points
- Application (points for each side)	Unslipped	0
	Slipped or washed	2
- Modification (points for each side)	Smoothed	1
	Fine Smoothed	2
	Burnished	3
	Polished	4
- Decoration:	Incisised (points for each side)	1
	Second slip (points for each side)	1
	Painted (points for each side)	1

In contrast to Costin and Hagstrum (1995), I opted to assign a value of 2 (instead of 1) to use of a slip. I did this in consideration of the fact that the spread of my final values would be much smaller than theirs, and also to decrease the overlap between final values. Following this scoring system, sherds in my project achieved values ranging from 2 (Unslipped + Smoothing on both sides + No further decoration) through 10 (Slipped + Burnished on both sides).

Decorated – incised, second slipped, and/or painted – sherds scored between 3 and 7. I excluded from analysis those sherds in which the surface treatment and/or the decoration were "not observable".

This methodology, as devised, has several inherent problems, including the the fact that not all of these tasks are completely independent of one another, and that vessel size matters. For example, it is highly improbable that a small restricted mouth vessel could get an overall value of 10, simply because of the difficulty of decorating the interior.

In part to deal with this problem, I decided to run two additional statistical analyses. These two analyses made use of the sherds that were collected as part of the survey, the intensive surface collections, and the test excavations.

The first analysis was a regression analysis to asses the "integrity" of the sherds under study. By "integrity," I refer to the idea that an external investment high value should be correlated with an internal investment high value and that, vice versa, an external investment low value should be correlated with an internal investment low value. If the regression analysis supports this correlation, then the "integrity" of the sherds valuation would be positive, and place my methodology on a stronger basis.

For the "integrity" analysis, 3166 sherds (all sherds for which I had an external and internal finishing investment value were included) were utilitzed. The results indicate that there is a moderate correlation between each side finishing investment value ($r = 0.613$, $p > 0.000$, $Y = 0.696X + 0.918$), lending support to my methodology (figure 5.3).

The values for each one of the intersections – that is, the amount of sherds in each category – are outlined in Table 5.2.

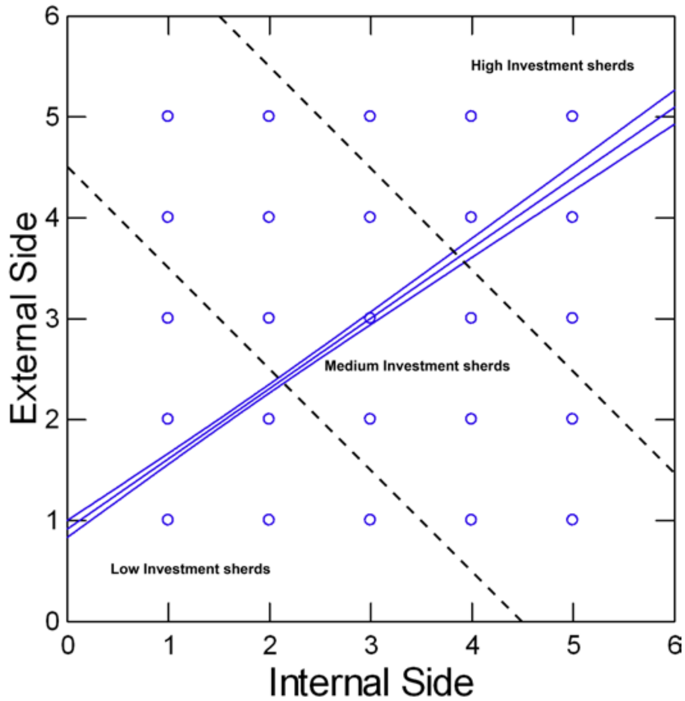

Figure 5.3 Scatter-plot of the External and Internal side investment scores, with a best-fit straight line and a 95% confidence zone

Table 5.2 Number of sherds in each External and Internal side investment scores intersection

External Side Investment	Internal Side Investment	# sherds
1	1	1093
1	2	46
1	3	40
1	4	9
1	5	2
2	1	257
2	2	651
2	3	20
2	4	38
2	5	2
3	1	151
3	2	32
3	3	237
3	4	4
3	5	10
4	1	88
4	2	97
4	3	12
4	4	143
4	5	2
5	1	52
5	2	28
5	3	30
5	4	15
5	5	107

These values are also useful to draw a surface (Figure 5.4 left) and a contour lines image (Figure 5.4 right), in which the number of sherds at each intersection is depicted as elevation. In the contour lines image the elevation curves are enter rather arbitrarily; from 1000 to 500 sherds at 100 intervals, from 500 to 100 sherds at 50 intervals, from 100 to 50 sherds at 25 intervals, and from 50 to 10 sherds at 10 intervals.

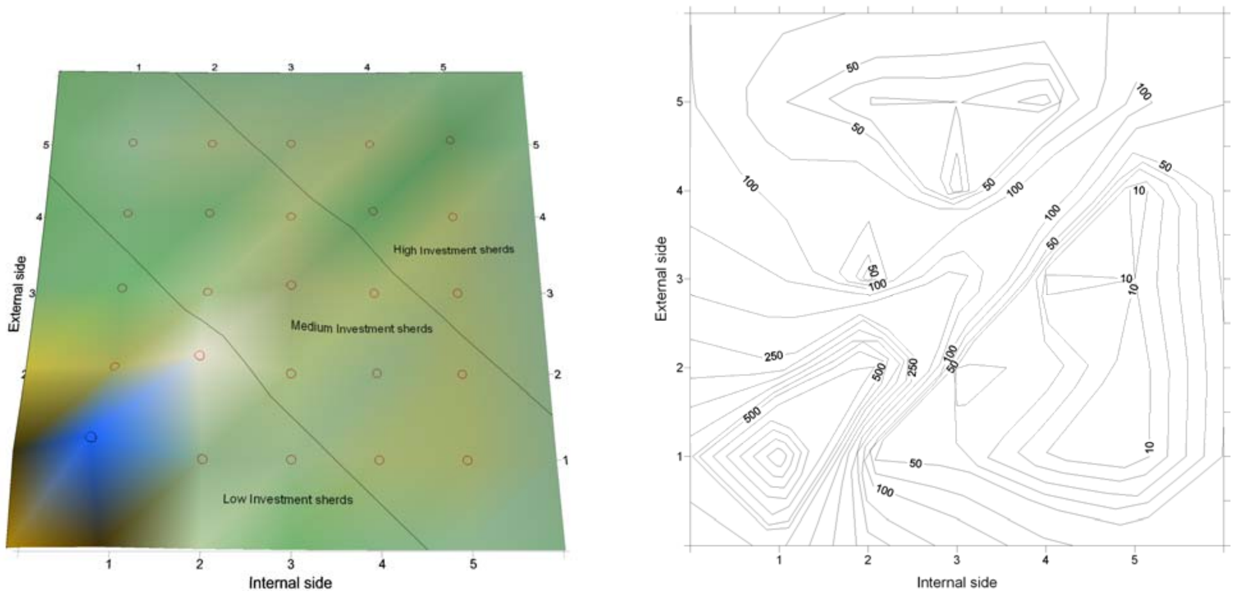

Figure 5.4 External and Internal side investment scores intersection countings represented as a surface and as contour lines.

These two figures denote clearly the high number of shreds that present similar values on their external and internal sides (the axis that runs from the lower left to the upper right corner). At the same time this surface also helps to discriminate two areas, around the 50 to 40 sherds contour.

The first area – in the upper section of the surface – presents values on the external side of 4 - 5, and on the internal side of 1- 4, with combined values of between 5 and 9. Given the relatively high external values, and low internal surface values, these cases could be denoting restricted mouth vessels such as jars.

The opposite situation can be seen in the lower right section of the surface. Here, external surface values are 1- 4, and in the internal side, from 3 - 5, with combined values of between 4 and 9. These values then could be denoting broad, open vessels as bowls.

These distinctions illustrate why we might expect the correlation between the treatment of both sides of a sherd to only be moderate.

The second regression analysis (using 2944 sherds) examined the relationship between the thickness of a sherd and the value assigned to it. The goal of this analysis was to examine if higher summed assemblage values could reflect an assemblage with proportionally more high value large vessels (more likely to have thicker walls, such as large storage vessels) or if the higher values might lie in small vessels (with thinner walls, such as serving vessels). The results indicate a very low correlation between sherd thickness and the finishing investment value ($r = -0.128$, $p > 0.000$, $Y = -0.122X + 8.804$) (Figure 5.5). In other words, the high value treatment was not reserved for vessels of a particular size or class. On the other hand, this analysis is also showing that high finishing investment vessels do not correlate with thinner walls, and therefore the former are not more propense to fragmentation and, at the end, I am not overestimating them in the samples.

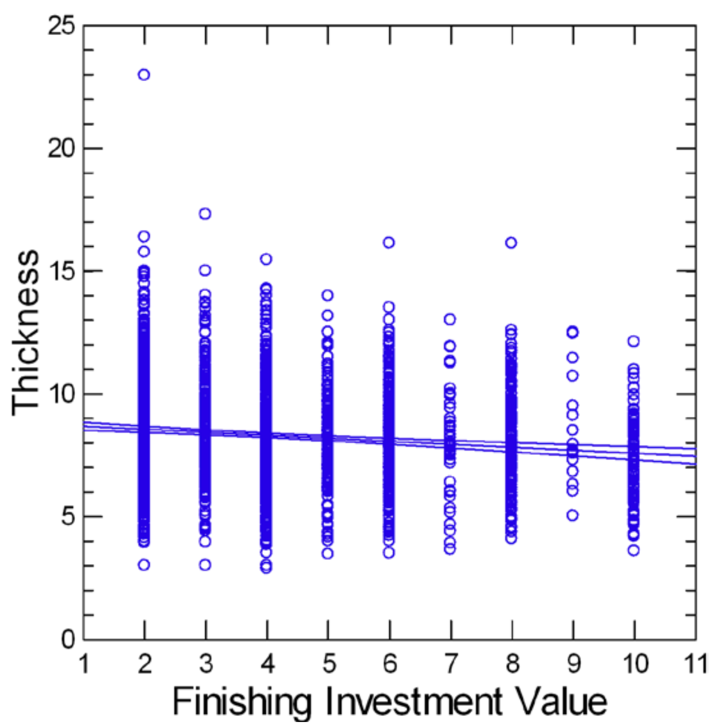

Figure 5.5 Scatter-plot of Sherd Thickness and Finishing Investment Value, with a best-fit straight line and a 95% confidence zone

Although for my Finishing Investment Index, I defined 9 value categories (2 through 10), I decided to collapse them into 3 main categories to use in comparing assemblages: Low (2, 3 and 4), Medium (5, 6 and 7), and High (8, 9, and 10) investment. I did this because my sample sizes per level at the test pits and in many surface collections units were very small, and therefore using the wider set of values produced large error ranges, reducing the confidence that can be placed in the results. My collapased categories are as followed.

In this fashion the Low Investment sherds correspond to sherds that are:

- Smoothed Exterior (1) + Smoothed Interior (1)	2
- Smoothed Exterior (1) + Smoothed Interior (1) + Painting (1)	3
- Fine Smoothed Exterior (2) + Smoothed Interior (1)	3
- Smoothed Exterior (1) + Fine Smoothed Interior (2)	3
- Burnished Interior (3) + Smoothed Exterior (1)	4
- Fine Smoothed Exterior (2) + Fine Smoothed Interior (2)	4
- Slipped Smoothed Exterior (3) + Smoothed Interior (1)	4
- Smoothed Exterior (1) + Burnished Interior (3)	4
- Smoothed Exterior (1) + Slipped Smoothed Interior (3)	4

The Medium Investment sherds correspond to sherds that are:

- Smoothed Exterior (1) + Slipped Smoothed Interior (3) + Incised (1)	5
- Smoothed Exterior (1) + Slipped Fine Smoothed Interior (3)	5
- Fine Smoothed Exterior (2) + Fine Smoothed Interior (2) + Incised (1)	5
- Fine Smoothed Exterior (2) + Fine Smoothed Interior (2) + Painting (1)	5
- Fine Smoothed Exterior (2) + Burnished Interior (3)	5
- Slipped Smoothed Exterior (3) + Fine Smoothed Interior (2)	5
- Slipped Fine Smoothed Exterior (4) + Smoothed Interior (1)	5
- Burnished Exterior (3) + Fine Smoothed Interior (2)	5
- Burnished Exterior (3) + Smoothed Interior (1) + Painting (1)	5
- Smoothed Exterior (1) + Slipped Burnished Interior (5)	6
- Fine Smoothed Exterior (2) + Slipped Fine Smoothed Interior (4)	6
- Slipped Smoothed Exterior (3) + Slipped Smoothed Interior (3)	6
- Slipped Fine Smoothed Exterior (4) + Fine Smoothed Interior (2)	6
- Slipped Burnished Exterior (5) + Smoothed Interior (1)	6
- Burnished Exterior (3) + Burnished Interior (3)	6

- Fine Smoothed Exterior (2) + Polished Interior (4)	6
- Burnished Exterior (3) + Slipped Smoothed Interior (3)	6
- Fine Smoothed Exterior (2) + Slipped Burnished Interior (5)	7
- Slipped Smoothed Exterior (3) + Slipped Fine Smoothed Interior (4)	7
- Slipped Fine Smoothed Exterior (4) + Slipped Smoothed Interior (3)	7
- Slipped Burnished Exterior (5) + Fine Smoothed Interior (2)	7
- Burnished Exterior (3) + Burnished Interior (3) + Painting (1)	7

The High Investment sherds correspond to sherds that are:

- Slipped Smoothed Exterior (3) + Slipped Burnished Interior (5)	8
- Slipped Fine Smoothed Exterior (4) + Slipped Fine Smoothed Interior (4)	8
- Slipped Burnished Exterior (5) + Slipped Smoothed Interior (3)	8
- Slipped Burnished Exterior (5) + Burnished Interior (3)	8
- Burnished Exterior (3) + Slipped Burnished Interior (5)	8
- Slipped Fine Smoothed Exterior (4) + Slipped Burnished Interior (5)	9
- Slipped Burnished Exterior (5) + Slipped Fine Smoothed Interior (4)	9
- Slipped Burnished Exterior (5) + Slipped Burnished Interior (5)	10

5.2.2 Lithic analysis

This analysis used a morpho-functional approach, following in part that already used by Jackson (1997) for a previous analysis of P31-1 lithics. Whereas he (1997) used 6 raw material groups, I chose to distinguish 9 raw material categories. A rough correlation is sketched in Table 5.3.

The nine raw material groups identified can be described in the following way:

- Fine Grain Igneous rocks: fine grain basalts and andesites.
- Medium-and-Coarse Grain Igneous rocks: medium and coarse grain basalts and andesites.
- Quartz: milky quartz with many inclusions and cleavages.
- Granite: Coarse granular igneous rock with visible quartz inclusions.
- Sandstone: Coarse grain rock, slightly compact and erosional.
- Other Fine Grain rocks: igneous rocks and other non-identified fine grain rocks.
- Other Coarse Grain rocks: unidentified coarse grain rocks, schists, and pumices.
- Obsidian: fine grain volcanic glass, black, homogenous, and translucent.
- Siliceous rocks: fine grain rocks, translucent and light.

Table 5.3 Lithic raw material correlation between this study and Jackson's (1997)

This study	Jackson (1997)
Fine Grain Igneous rocks	Basalt
Medium-and-Coarse Grain Igneous rocks	Basalt
Quartz	Quartz
Granite	Other rocks
Sandstone	Sandstone
Other Fine Grain rocks	Basalt
Other Coarse Grain rocks	Other rocks
Obsidian	Obsidian
Siliceous rocks	Silex

Each of these materials, save the obsidian and siliceous stone, can be found in island sources. Therefore these two raw materials demanded procurement from mainland sources. The known sources for the obsidian and siliceous stone sources are located at least 150 kms inland in the Andes.

Stone tools were sorted into three main functional groups:

- Polished lithics. These including polishing tools (hammerstone-polisher/hide-working tool, polisher, and polishers/hide-working tool), grinding tools (mano, mano-hammerstone, and grinding stone), net-sinkers, and net-sinker preforms.
- Pecked lithics. This includes tools as hammerstones, anvils, and grinding stone-anvils.
- Knapped lithics. This includes multi-task tools (for cutting, scraping, crushing, and hitting), cutting tools (knife, knife/side-scraper, marginal cutting tool, and chopper), scraping tools (scraper, scraper-notch, notch-denticulate, and plane), projectile points, drills, wedges, and also any bifacial preforms, cores, and all lithic debitage.

I classified as debitage all by-products that resulted from the manufacture of any tool. Such by-products could, of course, be discarded or further utilized, as either non-modified (unretouched) instruments or source material for the manufacture of other tool. Therefore, in the following analysis the "debitage" category will be opposed, unless otherwise indicated, to the "modified pieces" category. The debitage was classified in 4 technological categories: core debitage, marginal reduction debitage, bifacial reduction debitage, and bifacial retouching debitage (Cornejo y Galarce 2010).

5.2.3 Faunal Remains Analysis

The current analysis includes only the vertebrate fauna (birds, cartilaginous and bony fishes, and mammals), and not mollusks and crustaceans. One reason was that in Isla Mocha, shellfish use was not limited to subsistence. For example, shell was used as temper in native ceramics (and in today's concrete), and are used as fertilizer in the fields, and also as filling and paving material.

The analysis recorded for each specimen taxonomic position, taphonomic information, and cultural modifications. Taxonomic identification made use of reference collections as well as specialized manuals. Taphonomic information related to the natural and non-cultural variables that affected the faunal record of those animlas with a weight of over 5 kgs (Behrensmeyer 1978). Therefore, only the bones of the larger mammals were scored using Behrensmeyer´s meterorization stages, together with information on root action, and rodents and carnivores marks. Cultural modifications included signs of thermal alterations, cutting marks on bones, and the making of bones into tools. The quantification units utilized were the NISP (Number of Identified Specimens) and MNI (Minimum Number of Individuals).

5.2.4 Paleobotanical analysis

Samples (6.13 liters per each 5 cm level) taken for botanical analysis were processed with an assisted flotation machine. This made it possible to segregate a light and a heavy (over 3 mm) fraction. The macroremains heavy fraction was studied with a 5X magnifying glass, and the the light fraction with a binocular magnifier (6X to 63X). Botanical material was also classified as to preservation (charred/uncharred) and integrity (complete/fragmented).

Particular attention was paid to the former condition, because non-charred macrobotanical remains only preserve under very specific factors (such as permanent freezing, acidity, waterlogging, dessicaction), none of which were present in my research area. In other words, given the local environmental characteristics, were should expect the archaeobotanical record to include only burned remains, and any unburned macrobotanical materials were likely to have been intrusive and modern.

Identification of macroremains was carried out by consulting reference collections (Laboratorio de Arqueobotánica de la Universidad Austral, Herbario de la Universidad de Concepción) as well as reference manuals (Martin y Barkley 1973, Hoffman 1997, Matthei 1995, Mösbach 1992).

Our analysis divided the macroremains into three groups: identified, unidentified, and unidentifiable, and (within each one of these groups) into either charred or uncharred. The identifiable category included specimens for which a positive taxonomic identification was possible (through consideration of a combination of characteristics such as size, shape, and surface pattern). Unidentifiable specimens were those for which (because of the preservation condition, such as fragmentation and/or destruction by fire) positive identification was not possible. Finally, unidentified specimens were those for which although preservation of surface and features were good, no assignation to a specific family, genus, or species could be made.

6.0 FIELDWORK AND RESULTS

6.1 SURVEY

A full coverage pedestrian survey was conducted of the 6 km^2 research area. A total of 237 transects were walked, and 225 units were collected yielding about 4600 artifacts.

The density of artifacts at each collection point was used to identify residential "hotspots," and areas of concentrated occupation. In this way it was possible to identify clearly 3 high density concentrations (P29-1, P31-1, P5-1) within the research area, which, for simplicity's sake, I will refer to as "sites". These concentrations were separated by areas of either very low surface artifact density, or no surface remains.

These three sites were already recognized as such by the previous non-systemic survey conducted by Quiroz (2003), only differing in the spatial areas assigned to these. The differences in calculated site size result from the uses of different methodologies oriented to different goals. At the same time, no new comparable concentrations were identified in my survey, but for the mound complex. For this reason, I maintain the designations already given to those sites (this designation consists in the number of the *parcela* where the site is located, and then a number corresponding to the number of that site within that *parcela*).

The identified sites (the coordinate correspond to the center of the site; the datum is Psad 56) were:

- P29-1:

divided between the *Parcela* 29 and *Parcela* 28, but the most part is located within the first one. Its size is estimated at about 8.56 ha. (593760 W, 5756570 S). In Quiroz's (2003) survey, this site measures 0.3 ha.

- the Mounds Complex:

divided between the *Parcela* 29 and *Parcela* 30. The mounds themselves cover an area of about 0.15 ha, with are mostly located within the first *parcela*, but the associated plaza or platform seems to extend over 9.3 ha. (594260 W, 5756590 S)

- P31-1:

divided between the *Parcela* 31 and *Parcela* 1, but the most part located within the former. Its size is estimated in about 10.96 ha. (594880 W, 5755400 S). In Quiroz's (2003) survey, this site measures 1.2 ha.

- P5-1:

divided between the *Parcela 4* and *Parcela* 5, but the most part located within the last, and certainly extending beyond it as well into *Parcela* 6 (outside of my research area). Estimated size of about 17.74 ha. (595980 W, 5754370 S). In Quiroz's (2003) survey, this site measures 1.0 ha.

The Figure 6.1 shows the edges of the research zone, the sites discussed above, and the location of the *parcelas* arrangement. The dashed green line marks the boundary between the *parcelas* and the *Reserva Natural Isla Mocha*, and the solid green line the limits between *parcelas*. The red line (solid) marks the boundary of my research area, which to the west marks primarily the separation between the thick forest (unsurveyable) and the cleared areas (surveyed).

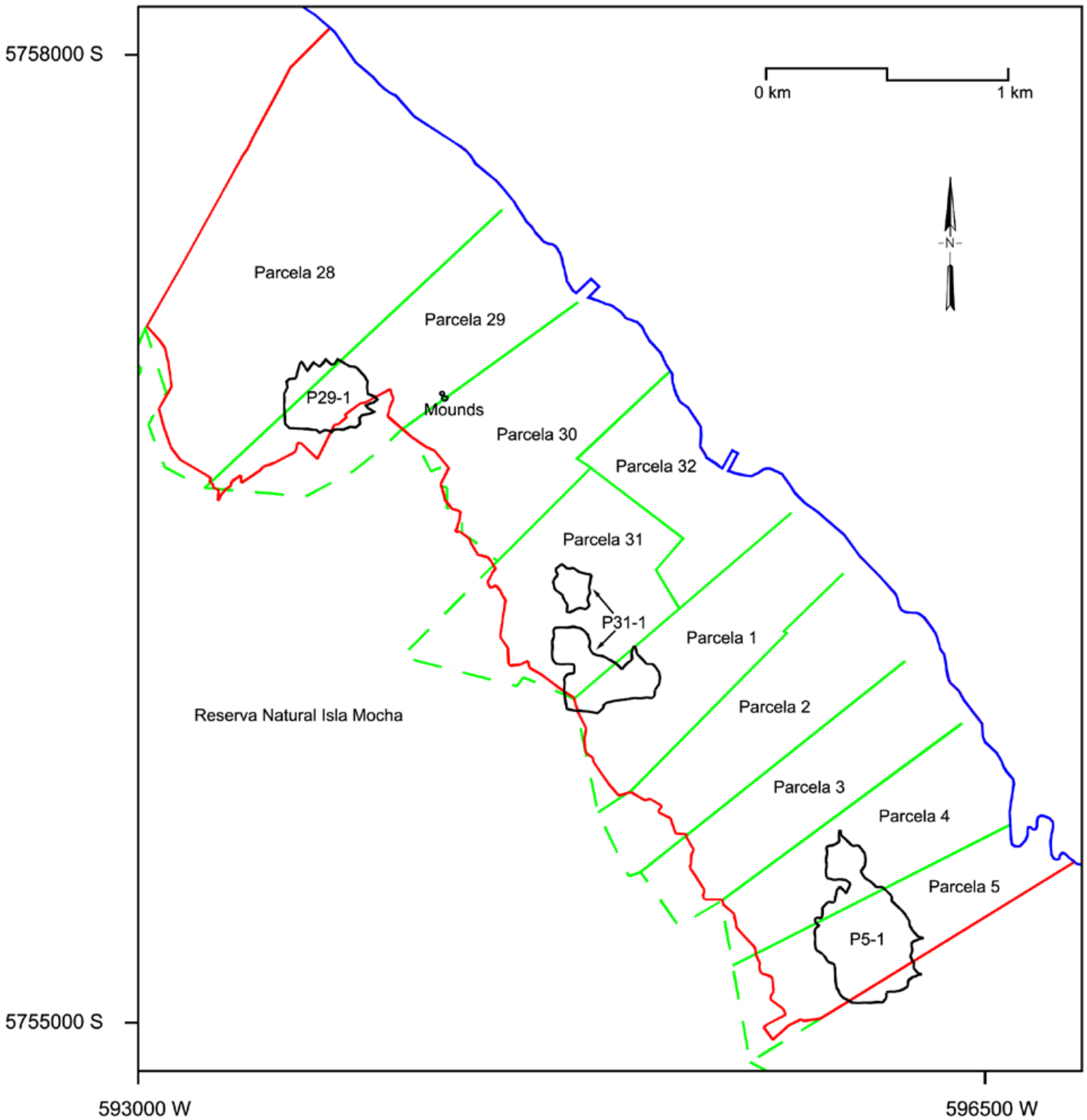

Figure 6.1 Identified archaeological sites in my research zone

In his survey, Quiroz (2003) also recognized three additional sites that did not correspond to any artifact concentrations recorded by my survey: P28-1 (El Vergel period), P4-1 (indeterminate date), and P30-1 (Archaic). In the case of the first two sites, even though artifacts were collected as part of my survey from where these sites were located, according to Quiroz (2003), the density of artifacts from these collections units was was so low that they did not stand out as representing a occupational nucleation, nor as an extension of P29-1 and P5-1, respectively. The area assigned by Quiroz (2003) to these sites was very small (0.25 ha for P28-1 and 0.12 ha for P5-1), and it remains possible that I did not find them because of significant change in the visibility or preservation of the artifacts on the surface. P30-1 site was located by Quiroz (2003) on a slope heavily prone to erosion and modern foot traffic. This site was partially excavated in the 1990s, revealing a deposit 45 cm deep. Quiroz (2003) did not record the mounds. I identified this site in 2007 during pre-dissertation reconnaissance in the agricultural fields, and they would have been "found" in any event in the 2009 full coverage survey.

The Figure 6.2 shows the edges of the research zone, the sites discussed above, and the location of collection points. The green line (dot-dashed) marks the boundary between the *parcelas* and the *Reserva Natural Isla Mocha*. The red line (solid) marks the boundary of my research area, which to the west marks primarily the separation between the thick forest (unsurveyable) and the cleared areas (surveyed). The blue line is the coast. Each black triangle corresponds to a collection point. As discussed in the previous chapter, collections were only made when surface artifacts were encountered. Therefore, spaces on the map devoid of collection points were largely devoid of surface materials. From north to south, the sites of P29-1, the Mound Complex, P31-1 (two sectors), and P5-1 are depicted with solid black lines.

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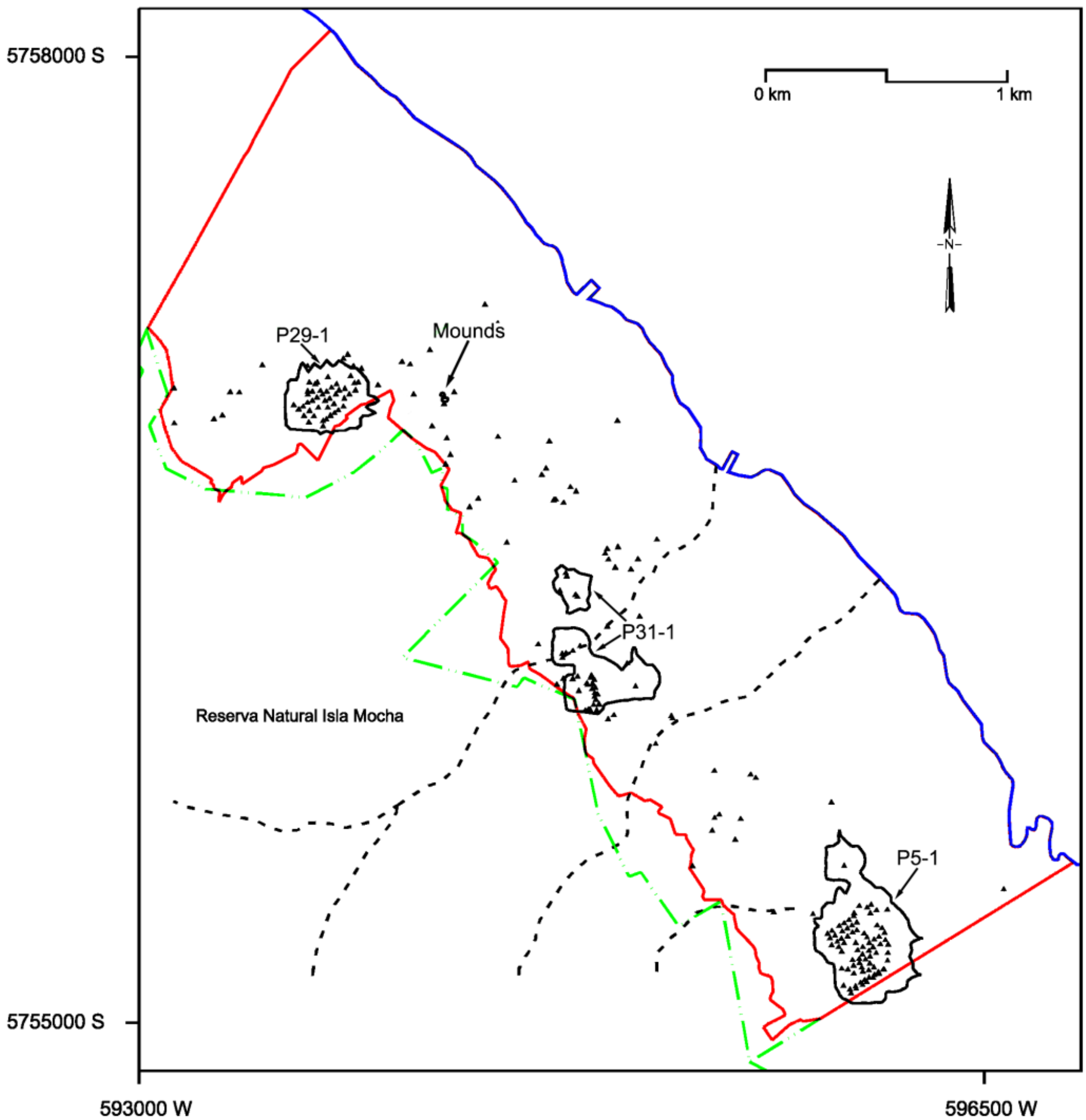

Figure 6.2 Collection points and identified in my research area

As can be seen, to the extent that surface materials reflect residential occupation, occupation was heavily concentrated at the three sites, spaced about 1 km apart, and each located about a half km or more inland. There was very little occupation between them, as indicated by the relatively few collection points, and by the generally low density of the scatters at these points. These “blank” spaces between sites can be then proposed mostly as sustaining areas or hinterlands, being the most discrete exception the mounds sector.

This pattern is illustrated in Tables 6.1 and 6.2. The three “sites” display not only a spatial concentration of collection points, but also high densities per collection point of sherds and lithics. For example, very little surface material was found west of P29-1 (52 sherds and 10 lithics from 8 collection units, with a density of 6.5 and 1.25, respectivelly), compared to the concentration of material at P29-1, with a density of 21.2 and 4.37. As will be seen, the relatively paucity of material outside of the three sites made comparing occupations at the centers to outlying or “rural” occupation very problematic.

Table 6.1 Sites and inter-site sherd and lithic density per collection point

Sector	# collection points	# sherds	# lithics	Sherd density	Lithic density
West of P29-1	8	52	10	6.5	1.25
P29-1 site	43	911	188	**21.2**	**4.37**
Between P29-1 and P31-1	45	144	39	3.2	0.87
P31-1 site	32	552	100	**17.25**	**3.13**
Between P31-1 and P5-1	18	183	18	10.2	1.00
P5-1	79	2111	263	**26.7**	**3.33**
Total	225	3953	618	17.57	2.75

Table 6.2 Sites and off-site sherd and lithic density per collection point

Sector	# collection points	# sherds	# lithics	Sherd density	Lithic density
Sites (P29-1, P31-1, P5-1)	154	3574	551	23.21	3.58
Off-sites areas	71	379	67	5.34	0.94
Total	225	3953	618	17.57	2.75

This aspect is supported by the fact that the ratio of lithics to ceramic sherds is rather constant at the site and off-site locations, denoting then that the last one indeed have significant lower densities of remains (Tables 6.3 and 6.4).

Table 6.3 Sites and inter-site lithics to sherds ratio

Sector	# sherds	# lithics	Lithics per sherd
West of P29-1	52	10	0.19
P29-1 site	911	188	0.21
Between P29-1 and P31-1	144	39	0.27
P31-1 site	552	100	0.18
Between P31-1 and P5-1	183	18	0.10
P5-1	2111	263	0.12
Total	3953	618	0.16

Table 6.4 Sites and off-site lithics to sherds ratio

Sector	# sherds	# lithics	Lithics per sherd
Sites (P29-1, P31-1, P5-1)	3574	551	0.15
Off-sites areas	379	67	0.18
Total	3953	618	0.16

Leaving aside the problems of scale between Dillehay's research area (250 km^2) and my area (6 km^2), the Isla Mocha pattern differs from the one proposed by him for the Purén-Lumaco area. As he states, "The domestic settlement pattern of the late pre-Hispanic period appears to be made up of two elements: small dispersed communities and family dwellings, and larger often single-mound communities of greater size than other contemporarysettlements" (Dillehay 2007:309, see also map on Dillehay and Saavedra 2010:2, or Dillehay 2007:279).

My evidence seems to be more amenable to the second element he indicates, but without the mound factor so strongly emphasized. On the other hand, my off-site collections still may orrespond to dispersed homesteads, but of a very low intensity –in both duration and remains. In that sense, they did not leave a so clear and discrete archaeological signal as the Purén-Lumaco's "small dispersed communities and family dwellings" seem to have left there.

Returning to Dillehay's assumptions the Isla Mocha situation would be revealing a process of population nucleation, in which the mound-building is not a so crucial factor. Therefore this population nucleation –and concomitantly, the absence of a more dispersed settlement pattern- should be related to other factors. These factors may go beyond –or weight differentially- of those outlined by Dillehay (2007:275), when he indicates that, "Some areas developed nucleated settlements associated with isolated mound building, incipient agriculture, public rituals, and partly centralized leadership in rich and geographically circumscribed valleys".

Another aspect to indicate is that Isla Mocha sites in my research area are larger that any domestic site reported by Dillehay. The largest Late Prehispanic-Early Hispanic site reported by him is Pu-120 with 20 ha (Dillehay and Saavedra 2010:97). Still, however, he (Dillehay 2007:300) indicates that "habitation sites of the late El Vergel (ca. 1200–1500), particularly of the early historic period [sic], range in size between 25 and 50 ha" and that "Between 1500 and 1750, sites generally range in size between 3 and 15 ha".

It is important to indicate that the three concentrations of material due not owe their existence to any differences in surface artifact visibility or modern land use patterns. For example, in each of the three sites, collection points in both recently plowed and unplowed areas yielded comparable densities. There were also plowed spaces within the sites that yielded no materials.

In terms of modern land use, one of the differences among the three sites is that the *parcelas* containing P29-1 and P5-1 had more in-use fields than the *parcelas* containing P31-1. This difference may explain why the former two sites had fewer points than the latter site, and should not be taken as indicating that occupation was less intense than at P5-1.

Surface collection at the collection points yielded a combined total of 3953 sherds, and 618 lithics. While all the lithics were analyzed, I selected a sample of these sherds for further analysis by arbitarily chosing one transect survey out of three (transects 1, 4, 7, 10 and so on). This yielded a sample of n=1144, or 29% of the total. Unfortunately, the ceramic analysis of these collections remains incomplete, and I currently have information for 365 sherds (9.23% of the total, or 31.91% of the sample). The Table 6.5 shows the breakdown of analyzed pottery by site/*parcela*.

Table 6.5 Analyzed sherds per site/*parcela*

Site	*Parcela*	# of analized sherds	# of sherds selected for sample analysis	% of the sample analyzed
P29-1	28 and 29	58	296	19.59
-	30	0	8	0
P31-1	31 and 1	39	169	23.08
-	2			
-	3	16	27	59.26
P5-1	4 and 5	252	644	39.13
Total		365	1144	31.91

For ease of analysis, in practice it was convenient to use the *parcela* as the unit of analysis. In other words, all the material collected in *parcelas* 28 and 29 corresponded to P29-1; *parcelas* 31 and 1 to P31-1; and *parcelas* 4 and 5, to P5-1. Between these sites lies *parcela* 30 (between P29-1 and P31-1), and *parcela* 3 (between P31-1 and P5-1).

6.1.1 Analysis of Survey Collection Ceramics

One of my overall goals was to use ceramic assemblages to recognize possible household level wealth/status differences. As explained in the previous chapter, the “Finishing Investment” Index” was designed for this purpose. I was able to record relevant information for 319 sherds (87.4% of those analyzed). The results are indicated in Table 6.6.

Table 6.6 Ceramic Finishing Investment types per site/*parcela*

Site	*Parcela*	# sherds	% Low Investment	% Medium Investment	% High Investmet
P29-1	28 and 29	47	78.72	19.15	2.13
P31-1	31 and 1	33	87.88	12.12	0.00
-	3	16	93.75	6.25	0.00
P5-1	4 and 5	223	79.82	17.94	2.24
Total		319	81.19	16.93	1.88

The Figure 6.3 shows that these sites (P29-1, P31-1, P5-1) show not significant differences (less than 80% confidence level) in the proportions of these categories of pottery when they are compared to the average value. In fact, the Parcela 3 is the one that most depart from the average.

On the other hand, when the sites are compared to each other, P31-1 displays a higher proportion of Lo Investment pottery than the other two sites (a significant difference at more than 80% confidence level). Also, P31-1 collection points yielded no High Investment pottery at all.

In this Figure -and in the following ones-, the Low investment ceramics is depicted in green, the Medium Investment one in blue, and the High Investment one in red.

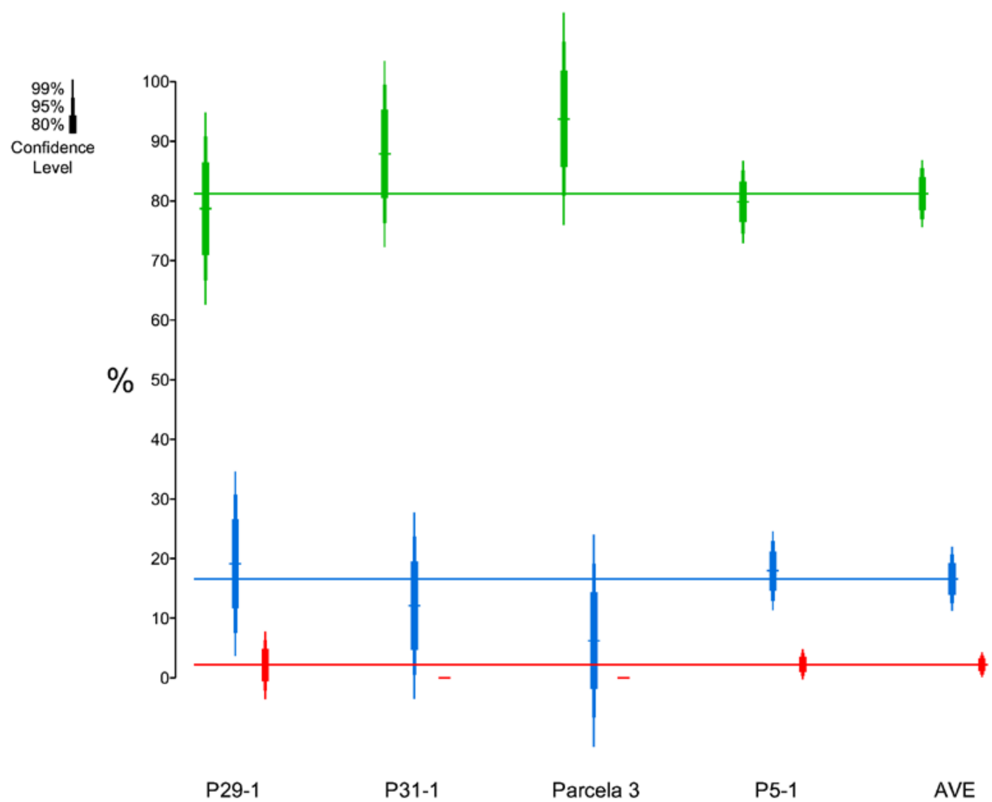

Figure 6.3 Proportions of ceramic finishing investment types per site/*parcela*.

In order to explore if the three sites corresponded to three distinct economic units in some way, I examined the spatial distribution of ceramic temper preferences. My expection is that marked intersite differences in temper choice would indicate the sites also represented three discrete production loci. Of the tempers represented in the sherd sample, the most common temper materials overall were sand and quartz, followed by shell, basalt and grog, although this is heavily weighted by the results at P5-1 from which most of the sample sherds came.

Table 6.7 Ceramic tempers per site/*parcela*.

Site	*Parcela*	# tempers	basalt	graphite	grog	peebles	quartz	sand	shells	silex
P29-1	28 and 29	87	13.79	2.30	3.45	4.60	17.24	20.69	26.44	11.49
P31-1	31 and 1	85	5.88	1.18	14.12	7.06	23.53	25.88	17.65	4.71
-	3	37	2.70	2.70	10.81	8.11	40.54	21.62	10.81	2.70
P5-1	4 and 5	532	10.90	1.50	8.27	5.45	24.62	26.13	17.11	6.02
Total		741	10.26	1.62	8.50	5.67	24.43	25.24	17.95	6.34

As shown in the Table 6.7 and Figure 6.4, it is P29-1 that differs from the very similar P31-1 and P5-1. P29-1 presents higher proportions of basalt, shell, and silex temper, and lower proportions of grog and quartz. The situation is reversed in P31-1 and P5-1. From this we can infer that residents of P29-1 were in a different ceramic production distribution network than the two sites to the south.

Figure 6.4 presents each temper proportions at the three sites. From left to right, the bullets correspond to P29-1, P31-1, Parcela 3, and P5-1. Parcela 3 (between sites P31-1 and P5-1) displays a high proportion of quartz temper.

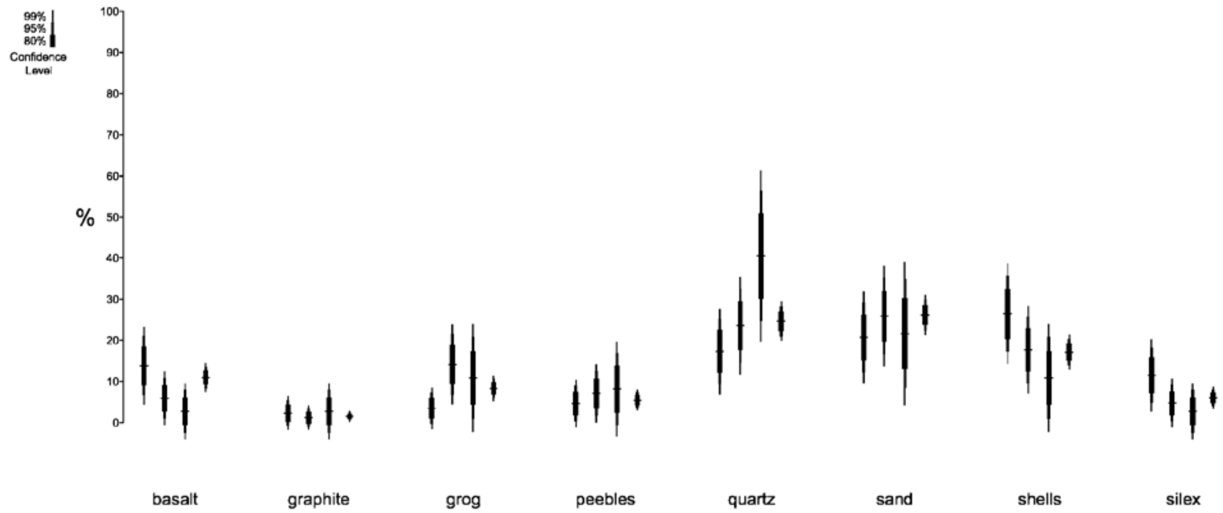

Figure 6.4 Proportions of ceramic tempers per site/*parcela*

So few diagnostics were present in the survey surface collections, that it is impossible to draw any meaningful conclusions about differences among the site in vessel form representation.

Table 6.8 Sherd types per site/*parcela*.

Site	*Parcela*	# sherds	Base	Body	Handle	Neck	Rim	Union	Inflection Point
P29-1	28 and 29	58		86.21		5.17	6.90		1.72
P31-1	31 and 1	39		92.31	2.56		5.13		
-	3	16		87.50		6.25	6.25		
P5-1	4 and 5	252	0.79	84.52	0.40	3.97	5.95	0.40	3.97
Total		365	0.55	85.75	0.55	3.84	6.03	0.27	3.01

In fact the rims typology, is dominated by indeterminate rims, bing followed by direct rims. The rims could correspond to severaldifferent vessels, therefore this information does not provide much new information.

Table 6.9 Ceramic rims types per site/*parcela*.

Site	*Parcela*	# sherds	Direct	Incurved	Everted	Indeterminate
P29-1	28 and 29	4				100.00
P31-1	31 and 1	2	50.00		50.00	
	3	1	100.00			
P5-1	4 and 5	15	33.33			66.67
Total		22	31.82	0	4.55	63.64

6.1.2 Analysis of Survey Collection Lithics

Lithic material from the survey was analyzed to reveal potential variability among the sites in overall lithic tool involvement, tool manufacture and use, or source material. Table 6.10 indicates the lithic raw material distribution.

Table 6.10 Lithic raw materials per site/*parcela*.

Site	*Parcela*	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
P29-1	28 and 29	23.08	50.00	7.69	7.21	0.00	2.40	8.65	0.00	0.96	208
-	30	0	37.50	0	12.5	12.5	0	37.5	0	0	16
P31-1	31 and 1	10.48	66.13	5.65	6.45	1.61	0.81	4.84	2.42	1.61	124
-	2	100	0	0	0	0	0	0	0	0	1
-	3	0	100	0	0	0	0	0	0	0	3
P5-1	4 and 5	37.97	38.72	4.89	13.53	2.26	1.50	0.75	0.38	37.97	266
Total		26.38	48.22	5.83	9.87	1.62	1.62	5.18	0.65	0.65	618

As expected, most stone tool remains represent use of local igneous rocks, with Fine Grain and Medium-and-Coarse Grain Igneous being the most common. Imported materials (obsidian and siliceous rock) make up an almost insignificant proportion.

The Figure 6.5 depicts raw material per site. From left to right each bullet corresponds to P29-1, P31-1, P5-1, and the average proportion.

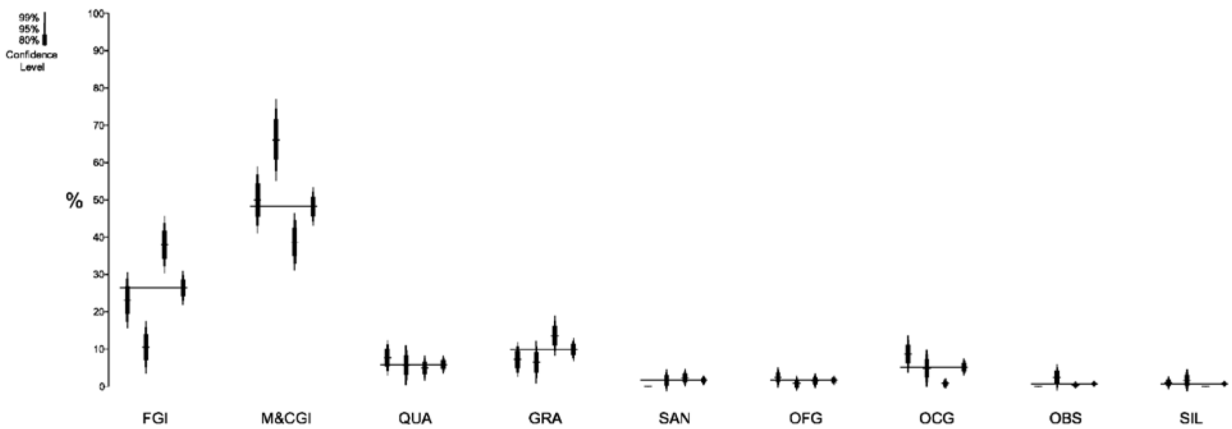

Figure 6.5 Proportions of lithic raw materials per site/*parcela*

As shown in Figure 6.5, there are some differences among the sites in terms of raw material. P31-1 has a significantly lower proportion of the Fine Grain Igneous rocks and higher proportion of the Medium-and-Coarse Grain Igneous rocks. The opposite situation obtains at P5-1. Currently, the meaning of these differences are unknown, but the most likely explanation is that this differences reflect the relative abundance of each material in the vicinity of the site.

The remaining raw materials are present in low proportions that, even though in some cases they depart from the average, we cannot draw conclusions from this with much confidence.

6.2 INTENSIVE SURFACE COLLECTIONS

The intensive surface collections were designed to provide large artifact assemblages to better compare residential loci and to explore possible intrasite variability at the three large sites. Six intensive surface collections were carried out: one at P31-1, two at P29-1, and three at P5-1.

Lithics were analyzed in the same ways as the survey collections. Faunal remains were also analyzed. As each of the intensive surface collection units was composed of 2 x 2 m quadrats, a sample of 11 quadrats (per surface collection unit) was selected for the ceramic analysis. As ceramic analysis is ongoing, this dissertation will present information from just two of the intensive surface collection areas.

Table 6.11 shows the information concerning the Intensive Surface Collection units.

Table 6.11 Intensive Surface Collections units summary

Site	Intensive Surface Collection Unit	Area (in m^2)	Total Ceramics	Ceramic sample	Total Lithics	Total Faunal Remains	Metallurgical slag
P29-1	02.29.01	216	5355	1000	1002	234	0
P29-1	03.29.01	212	5248	738	204	627	0
P31-1	01.01.01	225	2613	1321	205	115	0
P5-1	04.05.01	168	1923	510	114	58	0
P5-1	05.05.01	140	1500	531	191	29	1
P5-1	06.05.01	190	7167	1712	349	386	0
Total		1151	23806	5812	2065	1449	1

In Figures 6.6, 6.7, and 6.8, the Intensive Surface Collection units are shown as red blocks. Each black triangle corresponds to a survey colletion point.

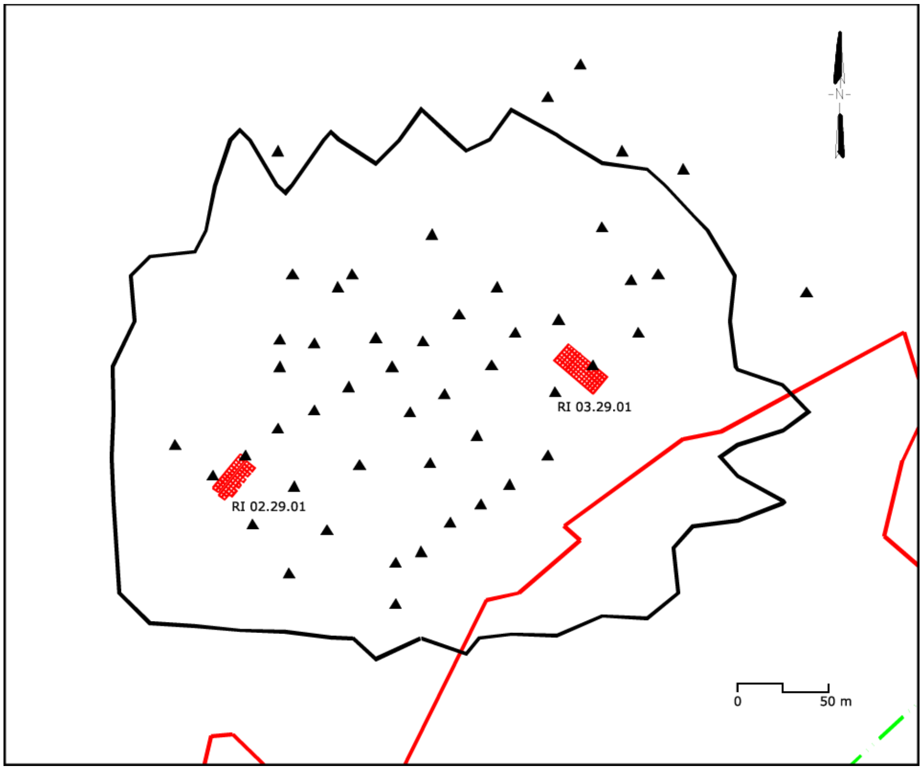

Figure 6.6 Intensive Surface Collections units at P29-1

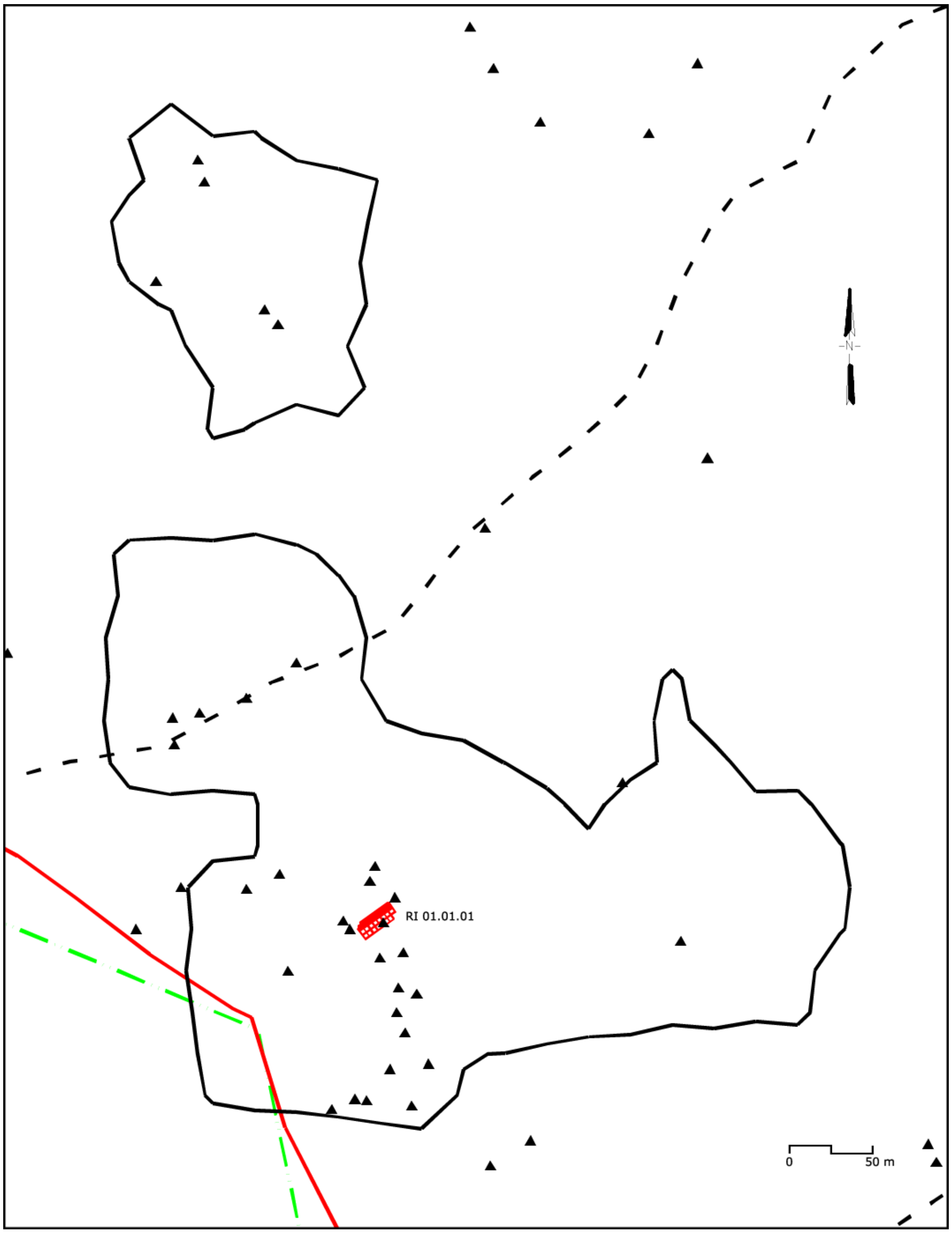

Figure 6.7 Intensive Surface Collections units at P31-1

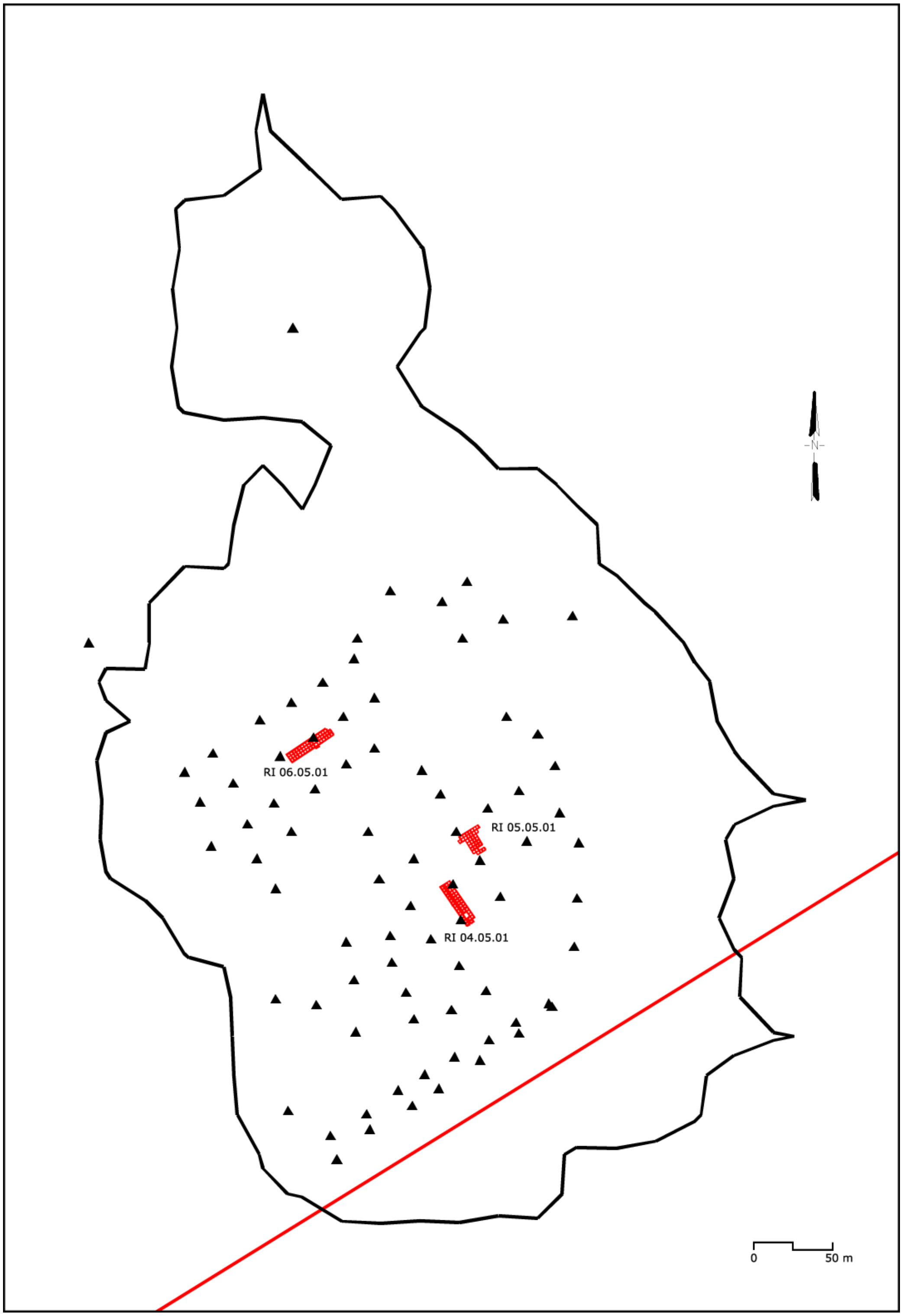

Figure 6.8 Intensive Surface Collections units at P5-1

The values on Table 6.11 already reveal some interesting differences between these collection areas. The densities per m^2 for ceramics, lithics, and faunal remains are indicated in Table 6.12.

Table 6.12 Materials density per Intensive Surface Collection unit.

Site	Intensive Surface Collection Unit	Ceramics per m^2	Lithics per m^2	Fauna remains per m^2
P29-1	02.29.01	24.79	**4.64**	1.08
P29-1	03.29.01	24.75	0.96	2.96
P31-1	01.01.01	11.61	0.91	0.51
P5-1	04.05.01	11.45	0.68	0.35
P5-1	05.05.01	10.71	1.36	0.21
P5-1	06.05.01	**37.72**	1.84	2.03
Average		20.68	1.79	1.26

These densities show that Unit 01.01.01 at P31-1 and 04.05.01 and 05.05.01 at P5-1 are very similar in all three categories.In contrast, Unit 06.05.01 at P5-1 presents a very high density of ceramic sherds; meanwhile Unit 02.29.01 at P29-1 presents a very high density of lithics. These intra-site differences indicate then aspects for analysis to which I will refer in specific in the following sections.

6.2.1 Analysis of Intensive Collection Ceramics

The two Intensive Surface Collections areas for which I have complete analyses are Unit 02.29.01 (at P29-1) and Unit 05.05.01 (at P5-1). Ceramics from these units were analyzed in the same manner as the pottery recovered from the survey collection points.

For the “Finishing Investment Index,” I was able to use 352 sherds from Unit 02.29.01 (35.2% of the analyzed sherds), and 486 sherds for Unit 05.05.01, (91.53% of the analyzed sherds). The low proportion of sherds suitable for analysis at Unit 02.29.01 reflects the strong erosion that materials at that site presented, preventing assessment of the surface finish. The results are indicted in Table 6.13 and Figure 6.9.

Table 6.13 Ceramic Finishing Investment types per Intensive Surface Collections unit

Site	Intensive Surface Collection Unit	# sherds	% Low investment	% Medium Investment	% High Investmet
P29-1	02.29.01	352	74.72	24.72	0.57
P5-1	05.05.01	486	73.25	23.66	3.09
Total		838	73.87	24.11	2.03

As shown in Figure 6.9, the ceramics from the two sites differ significantly (at more than 99% confidence level) in the proportion of High Investment sherds. Comparative proportions for the Low and Medium Investment sherds differ at less than 80% confidence level. The survey collection points comparison did not show a difference between P29-1 and P5-1, suggesting that the collection Unit 02.29.01 was placed in an area of P29-1 with relatively low High Investment pottery.

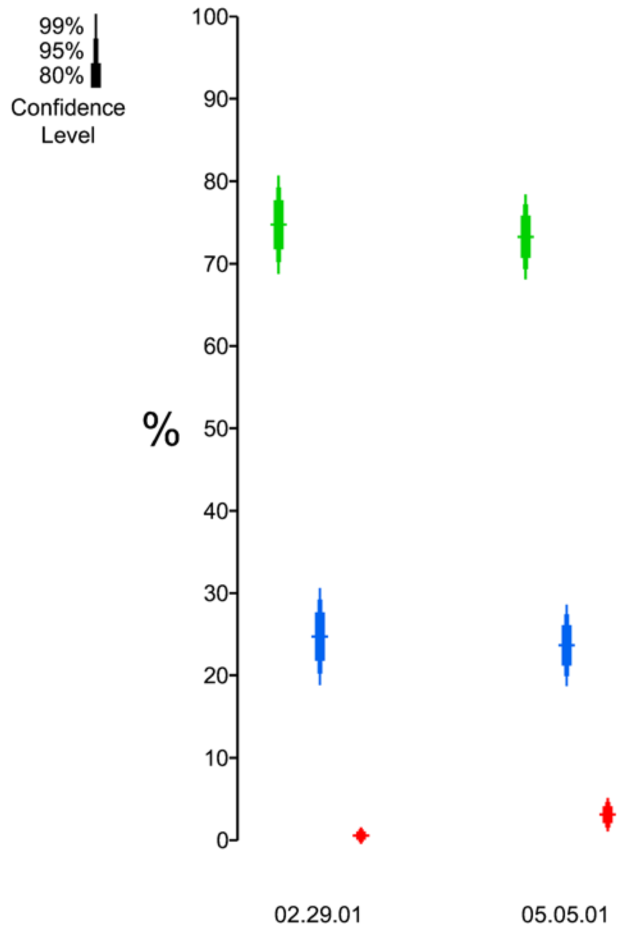

Figure 6.9 Proportions of ceramic Finishing Investment types per Intensive Surface Collections unit

The most common tempers in the intensive collection pottery in both samples were quartz, followed by shell, basalt, and sand (Table 6.14). Yet there were significant differences between the proportions of tempers at the two sites. As seen in Figure 6.10, the proportions for five of the eight tempers are different at more than a 99% confidence level. We can be highly confidant that these differences in temper preferences do not reflect the vagaries of sampling.

This ginding supports the surface collection point results indicating that residents of P29-1 and P5-1 were in different ceramic production/distribution spheres.

Table 6.14 Ceramic tempers per Intensive Surface Collections unit

Site	Intensive Surface Collection Unit	# tempers	basalt	graphite	grog	peebles	quartz	sand	shells	silex
P29-1	02.29.01	1564	3.90	0.00	3.90	0.00	69.37	20.97	1.85	0.00
P5-1	05.05.01	1108	32.49	0.00	4.51	0.00	1.62	6.14	43.68	11.55
Total		2672	15.76	0.00	4.15	0.00	41.28	14.82	19.20	4.79

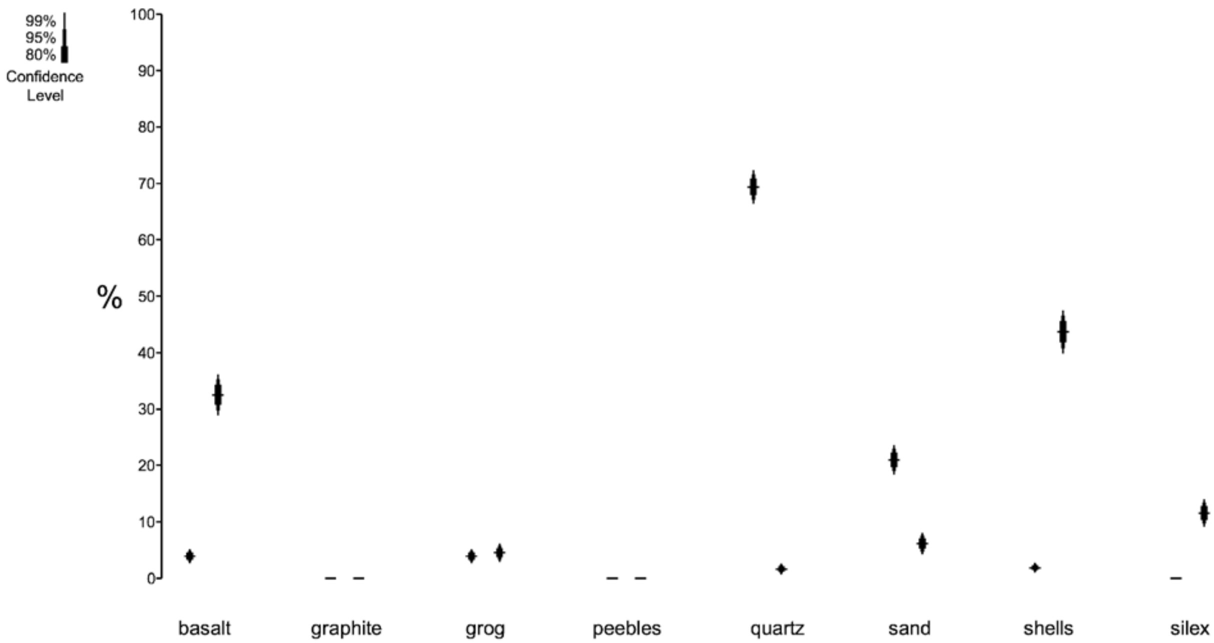

Figure 6.10 Proportions of ceramic tempers per Intensive Surface Collections unit

There were insufficient diagnostics present in the intensive surface collections to allow for any meaningful conclusions about differences among the site in vessel form representation (Table 6.15).

Table 6.15 Sherd types per Intensive Surface Collections unit

Site	Intensive Surface Collection Unit	# sherds	Base	Body	Handle	Neck	Rim	Union	Inflection Point	Indeter minate
P29-1	02.29.01	1000	0.10	70.30	2.00	1.30	5.10	0.00	1.60	19.60
P5-1	05.05.01	531	0.00	74.76	0.19	5.46	7.91	0.00	4.14	7.53
Total		1531	0.07	71.85	1.37	2.74	6.07	0.00	2.48	15.41

The rims analysis is not accomplished at this moment.

6.2.2 Analysis of Intensive Collection Lithics

Unsurprisingly, most tools and debitage from each collection were made from local Fine Grain and the Medium-and-Coarse Igneous stone (Table 6.16).

Table 6.16 Lithic raw materials per Intensive Surface Collection units

Site	Intensive Surface Collection Unit	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
P29-1	02.29.01	19.16	40.42	9.08	24.95	0.80	1.00	2.40	0.60	1.60	1002
P29-1	03.29.01	20.10	34.80	23.04	10.78	3.43	0.00	6.86	0.00	0.98	204
P31-1	01.01.01	19.51	45.85	7.32	9.76	3.41	0.00	13.66	0.00	0.49	205
P5-1	04.05.01	36.84	19.30	5.26	19.30	0.00	0.88	17.54	0.88	0.00	114
P5-1	05.05.01	16.75	50.26	5.24	20.42	2.62	0.52	3.66	0.00	0.52	191
P5-1	06.05.01	36.10	26.36	3.44	10.89	8.60	4.01	10.32	0.00	0.29	349
Total		22.95	37.77	8.77	18.98	2.76	1.26	6.25	0.34	1.02	2065

Figure 6.11 depicts the proportion of raw material from the six collection units, from left to right they each bullet corresponds to units 02.29.01, 03.29.01, 01.01.01, 04.05.01, 05.05.01, 06.05.01, and the average proportion. This figure reveals some significant intrasite variability among the units, and some intersite differences as well. Two of the three collection units at at P5-1, Units 04.05.01 and 06.05.01, present a proportion of Fine Grain Igneous rocks well above the average (at more than 99% confidence level), with a corresponding proportion below the average (at more than 99% confidence level) of the Medium-and-Coarse Grain Igneous rock. This finding is consistent with the survey collection point analysis indicating relatively higher use of Fine Grain Igneous rock then at other sites. Another intrasite difference is the relatively high proportion of Quartz in Unit 02.29.01 at P29-1. These differences suggest some spatial variability in raw material preferences (relating to status/wealth differences) to tool type production within sites. As revealed by survey collection, imported stone (such as obsidian or silex) is extremely rare.

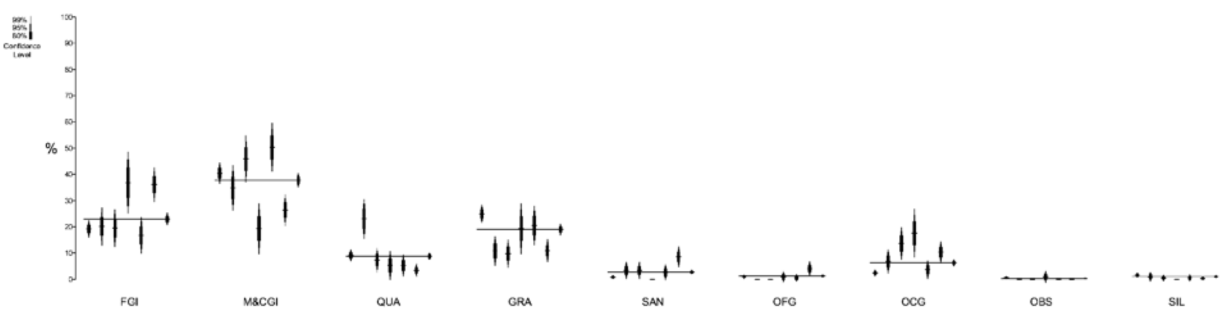

Figure 6.11 Proportions of lithic raw materials per Intensive Surface Collection units

The tables below provide the breakdown of debitage (Table 6.17) and modified pieces (Table 6.18) by raw material from the Intensive Collection units.

Table 6.17 Debitage by raw material per Intensive Surface Collection units

Site	Intensive Surface Collection Unit	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
P29-1	02.29.01	19.49	39.83	9.42	25.37	0.64	1.07	2.25	0.54	1.39	934
P29-1	03.29.01	20.23	34.10	26.59	9.83	2.31	0.00	5.78	0.00	1.16	173
P31-1	01.01.01	18.54	47.19	8.43	10.11	3.37	0.00	11.80	0.00	0.56	178
P5-1	04.05.01	34.34	20.20	6.06	22.22	0.00	1.01	16.16	0.00	0.00	99
P5-1	05.05.01	16.37	50.29	5.85	21.05	2.34	0.58	2.92	0.00	0.58	171
P5-1	06.05.01	35.46	26.20	3.83	11.82	9.27	4.15	9.27	0.00	0.00	313
Total		22.64	37.63	9.48	19.65	2.62	1.34	5.46	0.27	0.91	1868

Table 6.18 Modified pieces by raw material per Intensive Surface Collection units

Site	Intensive Surface Collection	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
P29-1	02.29.01	25.93	37.04	0.00	7.41	3.70	0.00	25.93	0.00	0.00	27
P29-1	03.29.01	14.71	48.53	4.41	19.12	2.94	0.00	4.41	1.47	4.41	68
P31-1	01.01.01	19.35	38.71	3.23	16.13	9.68	0.00	12.90	0.00	0.00	31
P5-1	04.05.01	53.33	13.33	0.00	0.00	0.00	0.00	26.67	6.67	0.00	15
P5-1	05.05.01	20.00	50.00	0.00	15.00	5.00	0.00	10.00	0.00	0.00	20
P5-1	06.05.01	41.67	27.78	0.00	2.78	2.78	2.78	19.44	0.00	2.78	36
Total		25.38	39.09	2.03	12.18	4.06	0.51	13.71	1.02	2.03	197

If one compares the ratio of debitage to modified pieces for each unit (Table 6.19), we can see the low proportion of modified pieces compared to debitage that occurs in Unit 02.09.01 of P29-1; or, looked at the other way around, the high proportion of debitage against modified pieces.

Table 6.19 Debitage to modified pieces ratio per Intensive Surface Collection units

Site	Intensive Surface Collection Unit	Debitage	Modified Pieces	Ratio
P29-1	02.29.01	934	27	**1 : 0.03**
P29-1	03.29.01	173	68	1 : 0.39
P31-1	01.01.01	178	31	1 : 0.17
P5-1	04.05.01	99	15	1 : 0.15
P5-1	05.05.01	171	20	1 : 0.12
P5-1	06.05.01	313	36	1 : 0.12
Total		1868	197	1 : 0.11

In fact, the latter statement would seem more correct, because the proportion of debitage per m^2 at this area really departs (at 4.32) from the values seen in the other five collection units (Table 6.20). Given this, we can tentatively identify the loci of this collection unit as reflecting a higher intensity of lithic manufacture at P29-1.

Table 6.20 Debitage and modified pieces density per Intensive Surface Collection units

Site	Intensive Surface Collection Unit	Area (in m^2)	All lithics	Debitage	Modified Pieces	All Lithics per m^2	Debitage per m^2	Modified Pieces per m^2
P29-1	02.29.01	216	1002	934	27	**4.64**	**4.32**	0.13
P29-1	03.29.01	212	204	173	68	0.96	0.82	0.32
P31-1	01.01.01	225	205	178	31	0.91	0.79	0.14
P5-1	04.05.01	168	114	99	15	0.68	0.59	0.09
P5-1	05.05.01	140	191	171	20	1.36	1.22	0.14
P5-1	06.05.01	190	349	313	36	1.84	1.65	0.19
Total		1151	2065	1868	197	1.79	1.62	0.17

At least, the ratio of lithics –and specially that of debitage- to sherds also supports this idea (Table 6.21). This proposition will be tested with excavation data from the test (as described in the next chapter).

Table 6.21 Lithics (debitage and modified pieces) to sherds ratio per Intensive Surface Collection units

Site	Intensive Surface Collection Unit	sherds	All lithics	debitage	modified pieces	All lithics per sherd	Debitage per sherd	Modified pieces per sherd
P29-1	02.29.01	5355	1002	934	27	**0.19**	**0.17**	0.01
P29-1	03.29.01	5248	204	173	68	0.04	0.03	0.01
P31-1	01.01.01	2613	205	178	31	0.08	0.07	0.01
P5-1	04.05.01	1923	114	99	15	0.06	0.05	0.01
P5-1	05.05.01	1500	191	171	20	0.13	0.11	0.01
P5-1	06.05.01	7167	349	313	36	0.05	0.04	0.01
Total		23806	2065	1868	197	0.09	0.08	0.01

Lithic analysis also aimed at looking at spatial differences in tool production, using the operative chain framework described in Chapter 5. Overall, each of the six Intensive Surface units presents a complete and decreasing lithic operative chain, with very similar proportions among units in each category (or stage). The most noticeable exception is Unit 06.05.01 at P5-1, with a core debitage proportion below the average (at more than a 95% confidence level).

Although we found a high ratio of debitage to modified pieces and a high density (per m^2) at Unit 02.29.01 of P29-01, the proportions of debitage categories were entirely consistent with those of the other Intensive Surface collections units (Table 6.22) Figure 6.12 depicts the proportion of debitage categories from the six collection units, from left to right they each bullet corresponds to units 02.29.01, 03.29.01, 01.01.01, 04.05.01, 05.05.01, 06.05.01, and the average proportion.

Table 6.22 Debitage categories per Intensive Surface Collection units

Site	Intensive Surface Collection Unit	Cores	Core debitage	marginal reduction debitage	bifacial reduction debitage	bifacial retouch debitage	N
P29-1	02.29.01	1.79	82.86	13.46	1.89	0.00	951
P29-1	03.29.01	3.35	84.36	11.73	0.56	0.00	179
P31-1	01.01.01	4.81	83.96	10.70	0.53	0.00	187
P5-1	04.05.01	5.71	83.81	7.62	1.90	0.95	105
P5-1	05.05.01	3.39	83.05	12.99	0.56	0.00	177
P5-1	06.05.01	2.80	77.64	13.98	4.97	0.62	322
Total		2.76	82.30	12.75	2.03	0.16	1921

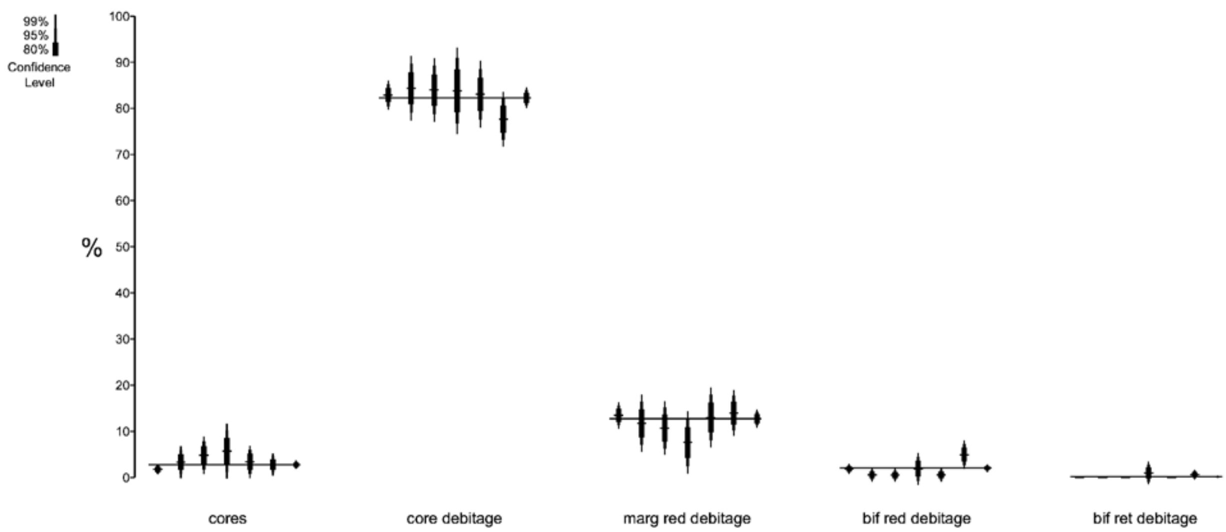

Figure 6.12 Proportions of debitage categories per Intensive Surface Collection units

Close analysis of the cores revealed a clear prevalence of the bipolar reduction technique over other reduction techniques (Table 6.23). This preference has been suggested by Jackson (1997), to have been common on the island as a way to take advantage of the relatively small basalt nodules that were locally available.

Table 6.23 Core reduction technique per Intensive Surface Collection units

Site	Intensive Surface Collection Unit	Bidireccional	Bipolar	Multidireccional	Unidireccional	n
P29-1	02.29.01	1	10	5	1	17
P29-1	03.29.01	0	6	0	0	6
P31-1	01.01.01	0	8	1	0	9
P5-1	04.05.01	0	6	0	0	6
P5-1	05.05.01	0	3	1	2	6
P5-1	06.05.01	0	9	0	0	9
Total		1	42	7	3	53

The proportion of recognizable chipped stone tools in the lithic assemblage was relatively low, suggesting much of Isla Mocha stone tool making was expedient (Table 6.24). So few specimens of finished tools were recovered, that we cannot make confident statements about their distribution among the Intensive Collection assemblages. Certain categories (projectile points, drillers, wedges, bifacial preforms, and knapping tested rocks) are so rare generally, that their absence at a site can be due simply to the vagaries of sampling.

On average the dominant tools in the six Intensive Surface collection units were multi-task ones, (34.95%), followed by scraping (27.64%) and cutting (21.95%) tools. In the case of the multi-task tools, only Unit 01.01.01 at P31-1 presents a proportion above the mean (at more than 99% confidence level). Correspondingly, this unit presents a low proportion of cutting (at more than 95% confidence level) and scraping (at more than 99% confidence level) tools. In contrast, Unit 04.05.01 at P5-1 presents a proportion above the mean (at more than 95%

confidence level) for the cutting tools. While there is the possibility that such differences denote areas specializing in certain activities within the sites, the dominance of multi-task tools, and the small sample under study, do not lend much support to this suggestion.

Figure 6.13 depicts the proportion of knapped tools from the six collection units, from left to right they each bullet corresponds to units 02.29.01, 03.29.01, 01.01.01, 04.05.01, 05.05.01, 06.05.01, and the average proportion.

Table 6.24 Knapped tools per Intensive Surface Collection units

Site	Intensive Surface Collection Unit	Multitask tools	Cutting tools	Scrapping tools	Projectile Point	Driller	Wedge	Bifacial Preform	Knapping tested rocks	n
P29-1	02.29.01	36.17	12.77	40.43	2.13	0.00	2.13	2.13	4.26	47
P29-1	03.29.01	33.33	22.22	27.78	0.00	0.00	0.00	0.00	16.67	18
P31-1	01.01.01	75.00	6.25	6.25	0.00	0.00	6.25	0.00	6.25	16
P5-1	04.05.01	14.29	71.43	14.29	0.00	0.00	0.00	0.00	0.00	7
P5-1	05.05.01	33.33	33.33	25.00	0.00	8.33	0.00	0.00	0.00	12
P5-1	06.05.01	13.04	30.43	21.74	8.70	8.70	13.04	0.00	4.35	23
Total		34.96	21.95	27.64	2.44	2.44	4.07	0.81	5.69	123

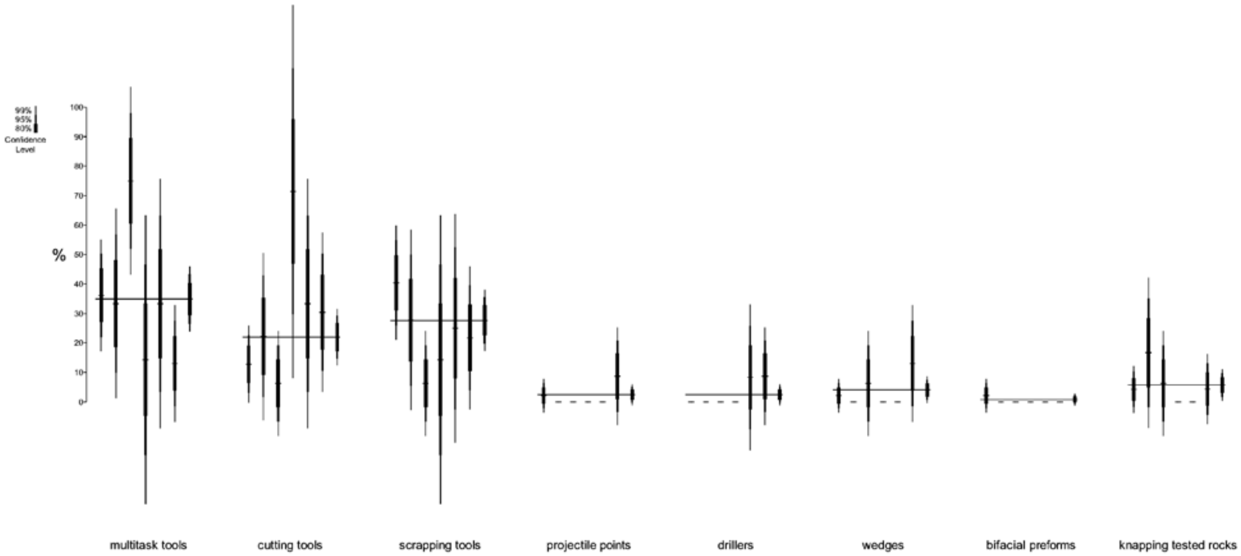

Figure 6.13 Proportion of knapped tools per Intensive Surface Collection units

Polished and pecked lithics are present in such low quantities that we cannot draw any conclusion from the inter-unit distribution at all (Table 6.25). The very low number of grinding stones found in any of the surface collections or excavations itself suggests that primary grinding of plant foods may have been with wooden, rather than stone, implements.

Table 6.25 Polished and pecked tools per Intensive Surface Collection units

		Polished					Pecked		
Site	**Intensive Surface Collection Unit**	**hammerstone-polisher / hide-working tool**	**hammerstone**	**anvil**	**polisher**	**mano**	**net-sinker**	**net-sinker preform**	**Indeterminate**
P29-1	02.29.01		1			1	1		1
P29-1	03.29.01		2		1	1		1	2
P31-1	01.01.01			1					1
P5-1	04.05.01	1	1		1				
P5-1	05.05.01						1		
P5-1	06.05.01	1						1	2
Total		**2**	2	4	1	2	2	2	6

6.2.3 Analysis of Intensive Collection Fauna Remains

As expected, faunal remains from the Intensive Collection units were highly fragmented, and therefore very difficult to classify as to taxon (particular below that of class) or skeletal part. Of the 1449 recovered bone fragments, nearly all of them (90.27%) can only be classified as "indeterminate mammal" remains.

The importance of native camelids to the Isla residents is indicated by the fact that, in each unit, the proportions of camelids surpasses the proportions of European domestic mammals, with camelid values ranging from 3.48% - 15.52% (Tables 6.26, 6.27, 6.28, 6.29, 6.30, and 6.31).

Table 6.26 Faunal remains at Intensive Surface Collection 02.29.01 unit (P29-1 site)

Class	Order	Genera	Specie	NISP	%	%
Aves	Indeterminate.			3	1.28	1.71
Aves	Charadriiformes	Haematopodidae	*Haematopus* sp.	1	0.43	
Chondrichthyes	Indeterminate.			6	2.56	2.56
Mammalia	Indeterminate.			194	82.91	89.74
Mammalia	Cetacea			1	0.43	
Mammalia	Artiodactyla	Camelidae		9	3.85	
Mammalia	Artiodactyla	Bovidae	*Bos taurus*	3	1.28	
Mammalia	Perissodactyla	Equidae	*Equus* sp.	2	0.85	
Mammalia	Rodentia	Octodontidae	*Octodon pacíficus*	1	0.43	
Osteichthyes	Indeterminate.			10	4.27	5.98
Osteichthyes	Perciformes	Carangidae	*Trachurus symmetricus*	2	0.85	
Osteichthyes	Perciformes	Gempylidae	*Thyrsites atun*	2	0.85	
Total				234	100.00	100.00

Table 6.27 Faunal remains at Intensive Surface Collection 03.29.01 unit (P29-1 site)

Class	Order	Genera	Specie	NISP	%	%
Chondrichthyes	Indeterminate.			5	0.80	0.80
Mammalia	Indeterminate.			572	91.23	98.41
Mammalia	Cetacea			1	0.16	
Mammalia	Artiodactyla			1	0.16	
Mammalia	Artiodactyla	Camelidae		24	3.83	
Mammalia	Artiodactyla	Bovidae	*Bos taurus*	3	0.48	
Mammalia	Artiodactyla	Bovidae	Ovis-Capra	4	0.64	
Mammalia	Artiodactyla	Suidae	*Sus scrofa*	1	0.16	
Mammalia	Carnivora	Otariidae	*Otaria flavescens*?	2	0.32	
Mammalia	Perissodactyla	Equidae	*Equus* sp.	9	1.44	
Osteichthyes	Indeterminate.			4	0.64	0.80
Osteichthyes	Batrachoidiformes	Batrachoididae	*Aphos porosus*	1	0.16	
Total				627	100.00	100.00

Table 6.28 Faunal remains at Intensive Surface Collection 01.01.01 unit (P31-1 site)

Class	Order	Genera	Specie	NISP	%	%
Mammalia	Indeterminate.			107	93.04	100.00
Mammalia	Artiodactyla	Camelidae		4	3.48	
Mammalia	Artiodactyla	Bovidae	*Bos taurus*	1	0.87	
Mammalia	Artiodactyla	Suidae	*Sus scrofa*	3	2.61	
Total				115	100.00	

Table 6.29 Faunal remains at Intensive Surface Collection 04.05.01 unit (P5-1 site)

Class	Order	Genera	Specie	NISP	%	%
Aves	Indeterminate.			1	1.72	1.72
Mammalia	Indeterminate.			46	79.31	98.28
Mammalia	Artiodactyla	Camelidae		9	15.52	
Mammalia	Artiodactyla	Bovidae	Ovis-Capra	2	3.45	
Total				58	100.00	100.00

Table 6.30 Faunal remains at Intensive Surface Collection 05.05.01 unit (P5-1 site)

Class	Order	Genera	Specie	NISP	%	%
Mammalia	Indeterminate.			29	100.00	100.00
Total				29	100.00	100.00

Table 6.31 Faunal remains at Intensive Surface Collection 06.05.01 unit (P5-1 site)

Class	Order	Genera	Specie	NISP	%	%
Aves	Indeterminate.			1	0.26	0.26
Mammalia	Indeterminate.			360	93.26	99.22
Mammalia	Artiodactyla	Camelidae		17	4.40	
Mammalia	Artiodactyla	Bovidae	*Bos taurus*	1	0.26	
Mammalia	Artiodactyla	Bovidae	Ovis-Capra	3	0.78	
Mammalia	Artiodactyla	Suidae	*Sus scrofa*	1	0.26	
Mammalia	Perissodactyla	Equidae	*Equus* sp.	1	0.26	
Osteichthyes	Perciformes	Carangidae	*Trachurus symmetricus*	2	0.52	0.52
Total				386	100.00	100.00

Even though the high amount of indeterminate mammal remains gives an image of homogeneity through the 6 Intensive Collection units, there are some differences to indicate. First of all, it is the point that the two units at the site P29-1 presented a larger stock of taxa (n= 12 at each, and 17 if they are combined) than any of the remaining units (n= 8 to1). This aspect is supported even if one excludes the European species.

This situation is not only –or not at all- an artifact of the amount of remains present at each unit, since the unit 06.05.01 at P5-1 presented as high as and similar countings to P29-1 units, and a rather high density of faunal remains per m^2. Also, all the Intensive Collection units, but for 03.29.01 at P29-1, have very similar ratios of faunal remains per sherds (Table 6.32).

Table 6.32 Sherds to faunal remains ratio per Intensive Surface Collections unit

Site	Intensive Surface Collection Unit	Sherds	Faunal remains	Faunal remains per sherd
P29-1	02.29.01	5355	1000	0.04
P29-1	03.29.01	5248	738	**0.12**
P31-1	01.01.01	2613	1321	0.04
P5-1	04.05.01	1923	510	0.03
P5-1	05.05.01	1500	531	0.02
P5-1	06.05.01	7167	1712	0.05
Total		23806	5812	0.06

These differences could be indicating a very diversified diet for the population occupying the P29-1 site. Finally, it is interesting to note that *Trachurus symmetricus*, a medium-size fish that probably demanded off-shore fishing was present at P29-1 and P5-1.

Concerning cultural modifications of faunal remains, the most frequent (n=112) was fire-exposure (burning, carbonization, and calcination) (Table 6.33), followed by far for cutting marks (Table 6.34), furrow and puncture marks (Table 6.35), and trampling marks (Table 6.36). It is very interesting that all of these marks are present in camelid bones, clearly denoting the widespread presence of this taxa on Isla Mocha.

Table 6.33 Faunal remains fire exposure marks per Intensive Surface Collections unit

Site	Intensive Surface Collection Unit	Class	Order	Genera	Specie	NISP
P29-1	02.29.01	Aves	Indeterminate.			1
		Mammalia	Indeterminate.			5
P29-1	03.29.01	Mammalia	Indeterminate.			58
P31-1	01.01.01	Mammalia	Indeterminate.			10
P5-1	04.05.01	Mammalia	Indeterminate.			4
		Mammalia	Artiodactyla	Camelidae		1
P5-1	05.05.01	Mammalia	Indeterminate.			5
P5-1	06.05.01	Mammalia	Indeterminate.			25
		Mammalia	Artiodactyla	Camelidae		3
Total						112

Table 6.34 Faunal remains cutting marks Intensive per Surface Collections unit

Site	Intensive Surface Collection Unit	Class	Order	Genera	Specie	NISP
P29-1	02.29.01	Mammalia	Indeterminate.			1
P29-1	03.29.01	Mammalia	Artiodactyla	Camelidae		1
P5-1	04.05.01	Mammalia	Indeterminate.			1
P5-1	06.05.01	Mammalia	Artiodactyla	Camelidae		2
Total						5

Table 6.35 Faunal remains furrow and puncture marks per Intensive Surface Collections unit

Site	Intensive Surface Collection Unit	Class	Order	Genera	Specie	NISP
P29-1	02.29.01	Mammalia	Indeterminate.			1
		Mammalia	Artiodactyla	Camelidae		1
P29-1	03.29.01	Mammalia	Indeterminate.			1
		Mammalia	Perissodactyla	Equidae	*Equus* sp.	3
P31-1	01.01.01	Mammalia	Artiodactyla	Bovidae	*Bos taurus*	1
		Mammalia	Artiodactyla	Suidae	*Sus scrofa*	1
Total						8

Table 6.36 Faunal remains trampling marks per Intensive Surface Collections unit

Site	Intensive Surface Collection Unit	Class	Order	Genera	Specie	NISP
P29-1	03.29.01	Mammalia	Artiodactyla	Camelidae		2
P31-1	01.01.01	Mammalia	Artiodactyla	Camelidae		1
P5-1	06.05.01	Mammalia	Artiodactyla	Suidae	*Sus scrofa*	3
Total						6

Finally, 3 artifacts were recovered as part of the Intensive Collections. Unit 01.01.01 at P31-1 yielded a spindle whorl manufactured on a camelid bone. Unit 05.05.01, yielded a polished artifact, of an unidentified bone species, that could be related to textile tasks. Unit 02.29.01 yielded a wedge manufactured of cetacean bone, probably related to wood-working.

6.2.4 Analysis of Metallurgical Slag

At the Unit 05.05.01 in P5-1, a small slag-like rounded piece was recovered as part of the Intensive Collection. This piece was analyzed by means of SEM (scanning electron microscope) and PIXE (particle-induced X-ray emission) revealing it is a cooper metallurgical slag.

The lack of an excavation context prevents a better understanding of what this artifact represents. However, given the historical human occupation of the island, the most plausible creators for this slag is the native population. In other words, it is difficult to think why sailors and whalers during the 18th and 19th century and the modern farmers –since 1850s- would be interested in smelting cooper ores to get metal.

This evidence is not at all unexpected for Isla Mocha, given the fact that at P12-1 and P31-1 sites, metallurgical slags have been previously obtained in contexts dated to El Vergel complex (Campbell 2004).

6.3 DISCUSSION OF SURVEY AND INTENSIVE SURFACE COLLECTIONS

The survey was a very useful and necessary tool in order to delineate more propercly the area of each one of the sites. In this sense, contrary to what I was initially expected it did not emerge a pattern of dispersed houselots but rather nucleated settlements. The differences between these settlements are difficult o draw at this moment or, at least, they did not emerge from these stages of analysis.

From the ceramics none of the sites -of a sector of them- stand out. All of them showed -with more or less fluctuations- a high amount of Low Investment ceramics (between 87.88% and 73.25%) and a very low amount of High Investment ceramics (between 3.09 and 0.00%).

The temper analysis indicates for each site differences that can be interpreted as each site was producing its own ceramics. Or at least, that there was not a unique production spot, or a regional exchange that obliterated site differences.

Finally, it is unfortunate that it is not possible to say much about vessel functions in the ceramic assemblages from each site. In the survey, at least, most of the rims had to be classified as indeterminate. The second most numerous category was simple, direct rims. On the other hand, given the nature of El Vergel pottery, it is unlikely that larger sample sizes would make ceramic function comparisons among assemblages much easier.

The lithics reflected clearly the widespread use that the Fine Grain and the Medium-and-Coarse Grain Igneous rocks had. These 2 local raw materials made out more than 60% of the lithic assemblages (63.92%, or 1254 pieces out of 2683). These presented fluctuations between sites and intra-site areas, which however could not be related to any particular process. On the other hand, good quality exotic raw material, presented an almost insignificant representation (1.34%, or 36 pieces out of 2683)

The obsidian and siliceous rocks should have been very valuable for Isla Mocha population, and therefore their relative scarcity is notable. The scarcity raises the question of whether the presence of a single piece of these materials at a site indicates very much at all.

At least for P29-1, I propose that Unit 02.29.01 may be a unit with an assemblage reflecting intensive lithic manufacture, based on the high proportion of debitage per m2, and the high ratios of debitage to lithic modified pieces and sherds.

Beyond that, all sites seemed to be involved in all stages of lithic manufacture. In other words, my samples found no evidence for inter or intra-site specialization in making lithic artifacts. Unit 02.29.01 may represent as assemblage that simply reflects relatively greater involvement in these tasks. The predominant use of local raw material of relatively poor quality, and obtainable only in small nodules, is in line with the widespread use of a bipolar technique of reduction. This situation is probably also reflected in the slight predominance of multi-task tools. Still, cutting tools and scraping tools constituted an important component of the lithic tool assemblages. In this sense, Unit 04.05.01 at P5-1 could have been more involved in tasks that demanded cutting tools. However, beyond this point, my general impression is that all sites were involved in rather similar tasks.

Finally, the faunal remains indicate the overall importance that camelids had in Isla Mocha meat consumption. Along with were birds and fish, which made smaller contribution to the faunal assemblages. Bones of European animals were very rare. An expected problem was the large amount of “indeterminate” or unidentified mammal bones, which could not be assigned as to taxon.

This pattern can be used to argue that most unidentified mammal bones correspond to camelids rather than to exotic species. At the same time, the European species appeared to have a somewhat different discard process, so perhaps their presence should not be expected in the archaeological sites.

Beyond that it is noteworthy that the Intensive Collections units at P29-1 yielded more taxa than any units at P31-1 and P5-1. This situation, then, could indicate a more diverse diet at the former site in comparison to the other two.

From the surface evidence alone, the three sites are very similar to one another, and would appear to represent rather autonomous communities. The lithic and faunal assemblages suggest some subtle differences, which are not so easy to correlate to processes of social differentiation, or wealth/status distinctions.

6.4 TEST PIT EXCAVATION

Test pitting was intended to accomplish two main goals: (1) provide additional assemblages for inter and intra site comparisons, and produce faunal remains and archaeobotanical samples; and (2) generate a chronological perspective through producing assemblages from stratigraphic contexts.

6.4.1 P29-1 Excavation

P29-1 was identified in the Quiroz survey (2003), but my work represented the first stratigraphic excavations carried out there. I excavated six 50 x 50 cm test pits. They were distributed in order to cover the entire site surface that was identified and delimited by the survey on the basis of high surface artifact density (Figure 6.14 and Table 6.37). Additionally, a 35 x 35 cm flotation column was made adjacent to the 29.01.02 test pit.

6.4.1.1 Location and stratigraphy 29.01.01 is in the margin of an agricultural field and very near (within 5 m) of a pond (maybe an ancient backshore pond). The entire deposit fill was a dark brown organic humid matrix. From 20 cm down, the matrix became more clayey, compact, and humid, probably as a result of the nearby pond. The matrix became so compact and water logged, that it was not possible to reach the sterile soil.

29.01.02 is located in an agricultural field. The first 30 cm were a loose clay loam, with shell but no roots, heavily disturbed by plowing. The 30-40 cm level was very similar to the overlying one, but with more and less fragmented shell. This level was not removed by plowing. The 40-50 cm layer was similar to the one above, but with contained an extensive hearth – lens feature. From the 50 cm down, the matrix was a more loamy clay, with less shell and charcoal. The weakness of the test unit walls required ending this unit at 85 cm depth.

29.01.02 Ext SE is adjacent to the 29.01.02 test pit. The stratigraphy here was identical to that of 29.01.02, including the 10 cm thick hearth – lens feature between the 40-50 cm depth. Below 100 cm, the matrix began to include more sand and crushed shells. At 110-120 cm, excavation ended on a sterile, sand and shell stratum, likely representing an ancient beach deposit.

29.01.03 is in an uncultivated, grassy area. The entire deposit was a clay loam matrix mixed with shell. At 60 cm deep the unit ended on the sterile soil formed by the ancient sand and shell beach.

29.01.04 is located in a fallow agricultural field in the slope of the central range. The matrix was a compact clay loam. The low artifact density and compactness of the matrix led to ending this excavation at 30 cm depth.

29.01.05 is located at the side of a private cart path. The first 20 cm consisted of a loose, organic, loamy clay, mixed with shells. At the 25 cm depth we encountered the sterile soil formed by the ancient sand and shell beach. The unit ended at 30 cm deep.

29.01.06 is located in a within a fallow agricultural field. The matrix was a loose clay loam. Given the low amount of remains, excavation ended at 30 cm deep.

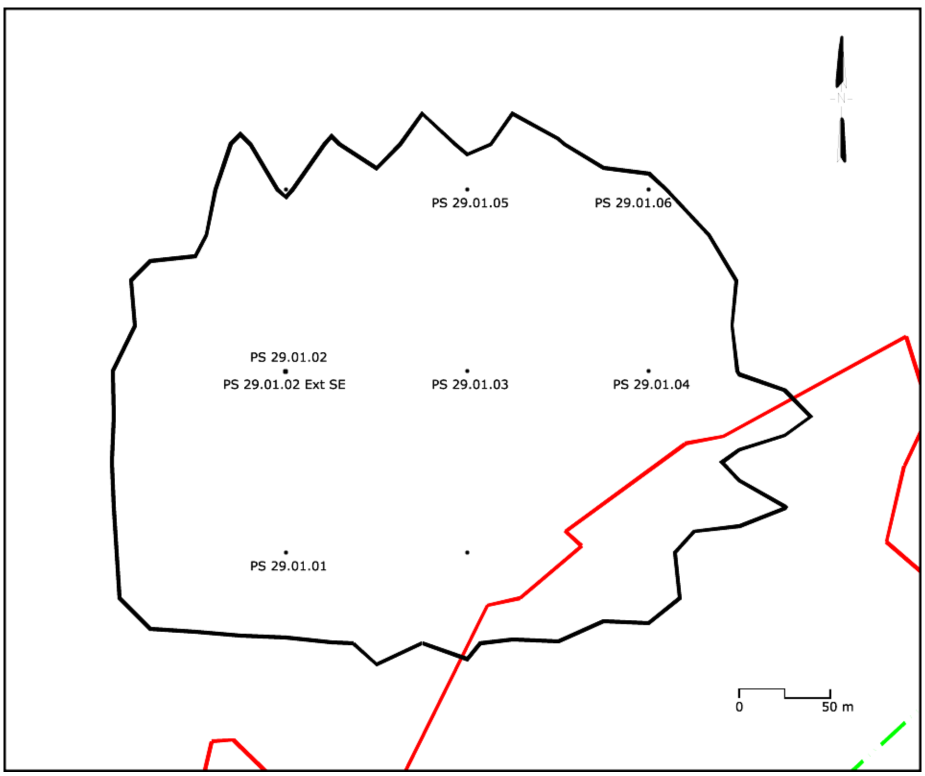

Figure 6.14 Test pits at P29-1 site

Only three units (29.01.01, 29.01.02, and 29.01.03) exposed deep deposits, reaching 60 - 85 cm deep, with artifact density figures of 0.59, 3.46, and 3.72 artifacts/liter, respectively. The other three test pits (29.01.04, 29.01.05, and 29.01.06) just went 30 cm deep. These shallow test pits artifact density figures of only 0.03 - 0.04 artifacts/liter.

The excavations showed a strong surface/subsurface relationship in artifact density. The test units of high density are those that fall within the area of highest surface density, while 29.01.04, 29.01.05 and 29.01.06 were in areas of low surface density.

Table 6.37 P29-1 test pits summary

Test pit	Coordinate (UTM)	Depth (in cm)	# ceramics	# lithics	# faunal remains	# others	Total	Volume excavated (in liters)	Artifacts per liter
29.01.01	593700 W 5756500 S	80	106	9	2	1	118	200	0.59
29.01.02	593700 W 5756600 S	85	470	78	188	1	737	213	3.46
29.01.02 Ext SE	593700 W 5756600 S	120	941	106	375		1422	402	3.54
29.01.03	593800 W 5756600 S	60	428	50	79	1	558	150	3.72
29.01.04	593900 W 5756600 S	30	1	1	1		3	75	0.04
29.01.05	593800 W 5756600 S	30	3				3	75	0.04
29.01.06	593900 W 5756700 S	30	1		1		2	75	0.03
Total			1950	244	646	3	2843	1190	2.39

Two additional test pits were planned for the margin of the site, but I could not obtain permission to dig these in cultivated fields. In order to compensate for this, I extended the unit 29.01.02 to the south-east (called thereafter “29.01.02 Ext E), so that original test pit and the flotation column became a single unit of 85 x 85 cm unit. In 29.01.02 Ext SE the sterile sand base soil was reached at 120 cm deep. My intention was to take the entire 85 x 85 cm unit to sterile, but the earthquake and tsunami prevented this. The artifact density for the 29.01.02 Ext SE was 3.54 artifacts/liter, very similar that of the 29.01.02 and 29.01.03.

6.4.1.2 Chronology Five AMS 14C dates were run on samples from the 29.01.02 Ext SE test pit (Table 6.38 and Figure 6.15)

Table 6.38 P29-1 radiocarbon dates

Sample	Depth	14C Age BP	Cal. Age AD ± 2σ	Δ13C	Material
AA 89416	30-40 cm	895 ± 38	1049 - 1270	-26.4	charcoal
AA 89417	50-60 cm	825 ± 36	1189 - 1287	-25.0	charcoal
AA 89418	70-80 cm	759 ± 38	1226 - 1384	-25.6	charcoal
AA 89419	90-100 cm	964 ± 36	1031 - 1202	-26.6	charcoal
AA 89420	110-120 cm	1105 ± 36	894 - 1033	-24.1	charcoal

The radiocarbon dates place occupation of the site between around AD 900 and 1400 (El Vergel). However, the later two dates (AA 89417 and AA 89416), read somewhat older than expected, given their stratigraphic position. I have no explanation for this, but suggest it may represent dating of agriculturally churned up material from older levels, and a natural perturbation migrating older botanical materials toward the surface. As there no dates from the uppermost 30 cm (much of which may have been plow disturbed or active in other ways), there can be no certainty as to when the site was abandoned. Given the dates available, and the heavy densities of ceramic and lithic remains in the upper three levels, I am tempted to think that the site remained occupied after AD 1400 and even through to island depopulation in AD 1687. Thus this site’s occupation would have begun in late Pitrén times, and ended in the historical period.

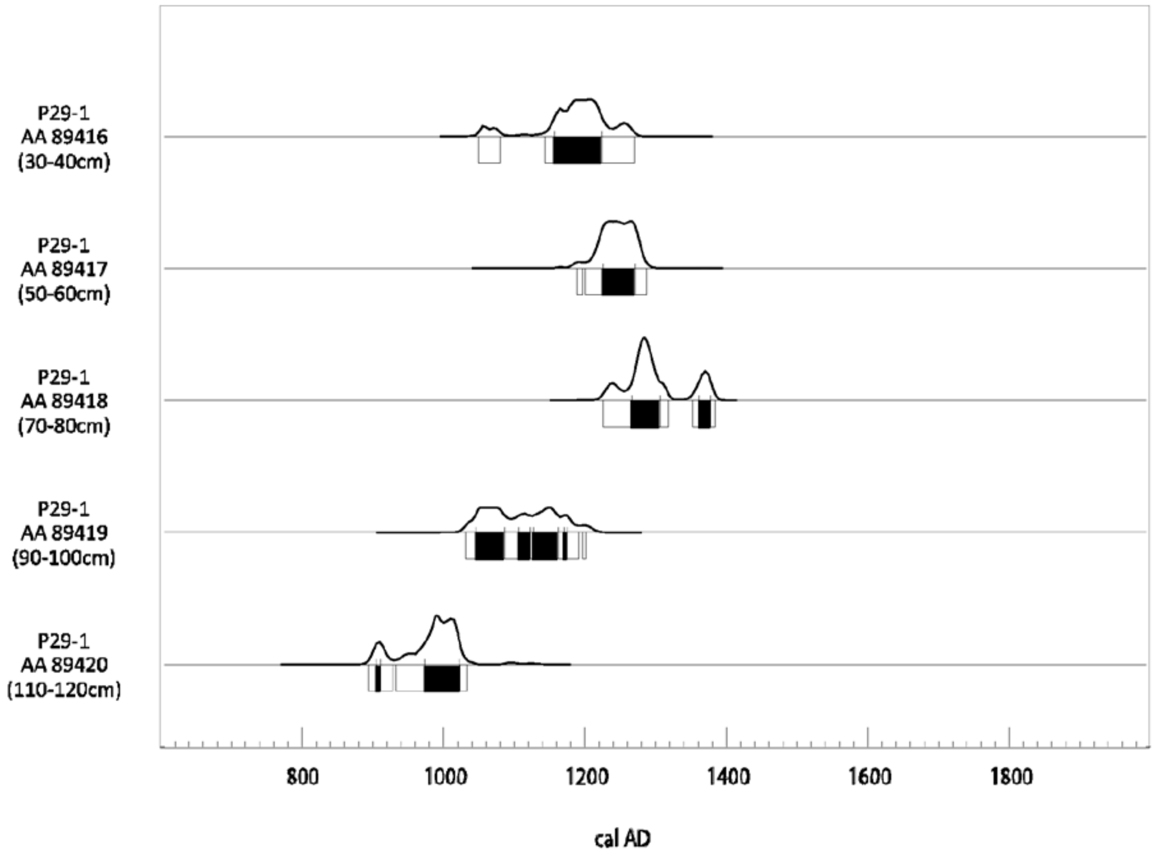

Figure 6.15 Plot for P29-1 radiocarbon dates

6.4.1.3 Ceramics This analysis uses the ceramics obtained from the six original tests pits, together with those from the lower levels (8 to 12, n=174) of 29.01.02 Ext SE. Because 29.01.02 was excavated only down to level 9, the values for the levels 8 and 9 will correspond –unless otherwise indicated- to both units together, and are indicated by the code 8-8SE or 9-9SE. Levels 10, 11, and 12 come only from 29.01.02 Ext SE. The total sample from all units used is 1178 sherds.

A total of 1000 sherds (84.89%) were appropriate for the "Finishing Investment Index" analysis (98 sherds from 29.01.01, 557 sherds from the combined unit “29.01.02 and 29.01.02 Ext SE”, and 345 sherds from 29.01.03), and were classified as Low (n=694, 69.4%), Medium (n=187, 18.70%), and High (n=119, 11.90%) investment. As expected, Low Investment sherds were most common, followed by Medium, while High Investment sherds were least common. The average proportion for each category type (Low, Medium, and High Investment) indicates that their differences are significant at more than 99% confidence level (Figure 6.16).

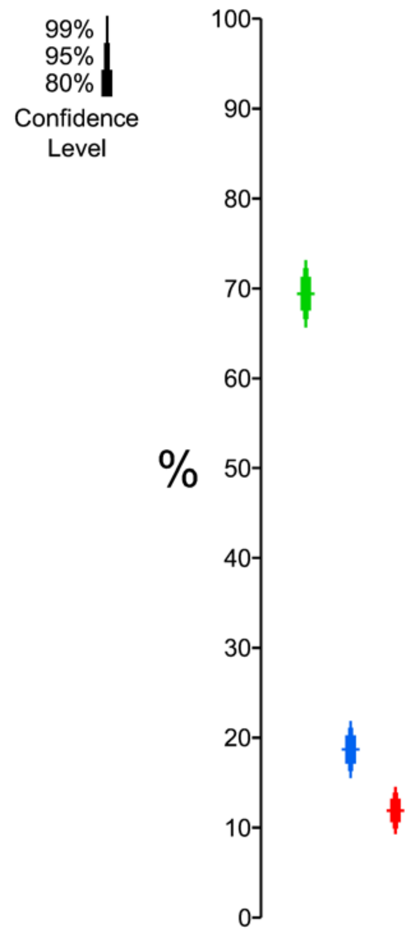

Figure 6.16 Proportions of ceramic Finishing Investment types at P29-1 test pits

Next, to investigate diachronic changes in the ceramic assemblage, I compare proportions through the different levels of each test pit. In two cases, contiguous excavation levels (29.01.03 Levels 5 and 6, and 29.01.02 Ext SE Levels 10-11-12) are combined to give a sample of at least 10 sherds. Thus, this analysis employs 22 “stratigraphic units” (Figure 6.17). The tables 6.39, 6.40, and 6.41 compile this information, showing which levels fell above or below the site mean proportion and the confidence level for each one of those estimates.

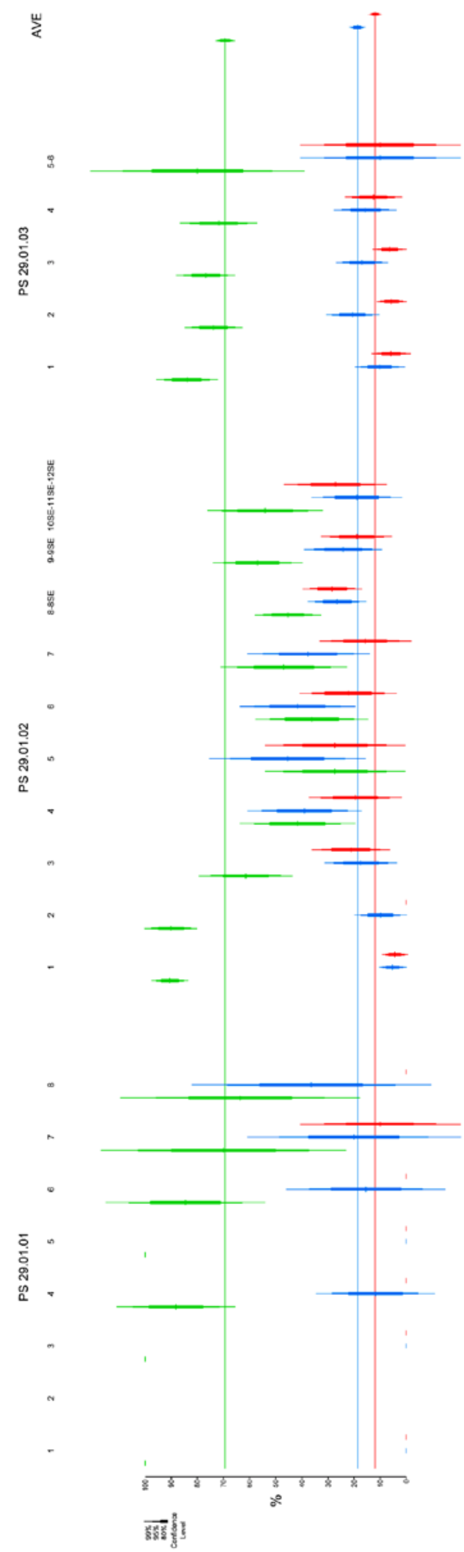

Figure 6.17 Proportions of ceramic Finishing Investment types per test pit stratigraphic unit at P29-1

Table 6.39 Low Investment sherds confidence levels per test pit stratigraphic unit at P29-1

Above the mean				Below the mean			
> 99% CL	> 95% and < 99% CL	> 80% and < 95% CL	< 80% CL	< 80% CL	> 80% and < 95% CL	> 95% and < 99% CL	> 99% CL
29.01.01 Levels 1, 3, 5 29.01.02 Levels 1, 2 29.01.03 Level 1	29.01.01 Level 4	29.01.01 Level 6 29.01.03 Level 3	29.01.01 Level 7 29.01.03 Level 2, 4, 5-6	29.01.01 Level 8 29.01.02 Level 3	29.01.02 Level 9-9E, 10-11-12	29.01.02 Level 7	29.01.02 Level 4, 5, 6, 8-8E

Table 6.40 Medium Investment sherds confidence levels per test pit stratigraphic unit at P29-1

Above the mean				Below the mean			
> 99% CL	> 95% and < 99% CL	> 80% and < 95% CL	< 80% CL	< 80% CL	> 80% and < 95% CL	> 95% and < 99% CL	> 99% CL
29.01.02 Level 6	29.01.02 Levels 4, 5, 7	29.01.02 Level 8-8E	29.01.01 Level 7, 8 29.01.02 Level 9-9E, 10-11-12 29.01.03 Level 2	29.01.01 Levels 4, 6 29.01.02 Level 3 29.01.03 Level 3, 4, 5-6		29.01.02 Level 2 29.01.03 Level 1	29.01.01 Levels 1, 3, 5 29.01.02 Level 1

Table 6.41 High Investment sherds confidence levels per test pit stratigraphic unit at P29-1

Above the mean				Below the mean			
> 99% CL	> 95% and < 99% CL	> 80% and < 95% CL	< 80% CL	< 80% CL	> 80% and < 95% CL	> 95% and < 99% CL	> 99% CL
29.01.02 Level 8-8E	29.01.02 Level 10-11-12	29.01.02 Level 3, 5, 6, 9-9E	29.01.02 Level 4, 7 29.01.03 Level 4	29.01.01 Level 7 29.01.03 Levels 5-6		29.01.03 Levels 1, 3	29.01.01 Levels 1, 3, 4, 5, 6, 8 29.01.02 Levels 1, 2 29.01.03 Level 2

It is clear that levels 9-9SE through 4 of 29.01.02 contained significantly low (at more than 80% confidence level) proportions of the Low Investment ceramics. In contrast, these same levels of both 29.01.01 and 20.01.03 nearly all present values for Low Investment pottery above the site average (at different confident levels). Levels 1 and 2 of 29.01.02 are consistent with the other two test pits in terms of Low Investment pottery, having values above the average at more than 99%confidence level.

In most stratigraphic units, Medium Investment ceramics proportions are either below or above the site average, but at less than 80% confidence level. The only exceptions to this pattern are levels 4 – 8E of 29.01.02 which present proportions above the site average (with confidence levels above 80%), and Level 1 of 29.01.03 Level 1 (with a proportion below the average at more than 95%confidence level).

Also shown in the above tables is that 29.01.02 consistently showed higher proportions of High Investment pottery in comparison with the other units. This unit has values above the mean in 8 of 10 levels, and in 6 levels, with more than 80% confidence level. The other two test pits show values below the site average, mostly at more than 99% confidence level, and indeed the 29.01.01 test pit did not yield High Investment sherds in 7 out of 8 levels.

A total of 2041 temper media were observable on 1183 sherds (Table 6.42). Most sherds presented more than one type of temper, and we ultimately identified 68 different combinations (including those with a single temper type).

Table 6.42 Ceramic tempers at P29-1

Temper	# tempers	%
Peebles	520	**25.48**
Sand	491	**24.06**
Shells	396	**19.40**
Quartz	291	14.26
Basalt	220	10.78
Silex	97	4.75
Graphite	18	0.93
Grog	7	0.34
Total	2041	100.00

Of those 1183 sherds, 505 (42.69%) presented only 1 temper, sand (n=233) being the most common, followed by pebbles (n=184). A total of 522 (44.13%) sherds exhibited 2 temper materials, the most common combination being shell with pebbles (n=121) and sand and shell (n=85). A total of 132 sherds (11.16%) had 3 tempers, but none of these three combinations were seen in more than 20 sherds. Finally, only 24 sherds (2.03%), presented 4 tempers, none of these three combinations were seen in more than 5 sherds.

Most of the pottery represented body fragments, inhibiting the assignation of functions to the ceramic assemblages represented at the site (Table 6.43).

Table 6.43 Sherd types per test pit at P29-1

Test Pit	# sherds	Body	Handle	Rim	Inflection Point	Rim-Neck	Rim-Handle
29.01.01	106	90.57	0.94	6.60	0.94		0.94
"29.01.02 & 29.01.02 Ext SE"	644	83.54	1.24	7.30	7.76	0.16	
29.01.03	428	82.94	0.70	5.84	10.51		
29.01.04	1	100.00					
29.01.05	3	66.67					
29.01.06	1	100.00					
Total	1183	83.94	1.01	6.76	8.11	0.08	0.08

For what it is worth, direct rims were the most common rim form (Table 6.44), and while direct rims have been associated with plates and mugs in previous ceramic typologies, the complete absence of everted rims likely indicates that in this case, direct rims were also used on jars, ollas, bottles, and urns.

Table 6.44 Ceramic rims types per test pit at P29-1

Test Pit	# sherds	Direct	Incurved	Everted	Indeterminate
29.01.01	8	100.00			
"29.01.02 & 29.01.02 Ext SE"	48	79.17	6.25		14.58
29.01.03	25	68.00	12.00		20.00
29.01.05	1				100.00
Total	82	76.83	7.32		15.85

In sum, the ceramic analysis shows inter-residential unit variability in the "value" of domestic pottery assemblages at the site, with Unit 29.01.02 standing out from 29.01.01, and to a lesser extent, 29.01.03, in proportions of high value pottery. In fact, no High Investment ceramics at all were found in levels 1, 3 to 6, and 8 of 29.01.01. The radiocarbon dates show that this difference began at the time occupation in the area was established, and persisted for about 500 years, until 1400.

6.4.1.4 Lithics The test pits provided a total sample of 244 lithics. Most of the material (92.75%) was recovered from units 29.01.02 and 29.01.03, together with 29.01.02 Ext SE. The low sample size makes it difficult to draw confident conclusions from the lithic analysis, or to identify chronological trends. Therefore, I will mostly discuss inter-unit comparisons.

Table 6.45 Lithic raw materials per test pit at P29-1

Test Pit	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
29.01.01	33.33	44.44	11.11	11.11						9
29.01.02	69.23	15.38		6.41		2.56	3.85	2.56		78
29.01.02 Ext SE	55.66	23.58		4.72	2.83		9.43	2.83	0.94	106
29.01.03	46.00	24.00	12.00	6.00	2.00		10.00			50
29.01.04		100.00								1
Total	56.97	22.13	2.87	5.74	1.64	0.82	7.38	2.05	0.41	244

As shown in Table 6.45, most lithics in each test pit were made of local igneous rock, with percentages ranging from 70 – 100%. Surprisingly, fine-grained material dominated in the excavated assemblages, while Medium-and-Coarse Grain made up the majority of the surface assemblages (from both survey and intensive collections). It is difficult to draw an explanation for this phenomenon, other than perhaps a very late change in preference to the latter material.

In Figure 6.18, I combine 29.01.02 and 29.01.02 SE (given that they are contiguous) into a single unit called “29.01.02 & 29.01.02 SE”, and I also exclude test pit 29.01.04 as it yielded only one lithic. We can see that unit, “29.01.02 & 29.01.02 SE” has proportionally more Fine Grain Igneous Rocks (at more than 80% confidence level) than the other test pits. Additionally, the imported obsidian and siliceous rock is restricted to just the “29.01.02 & 29.01.02 Ext SE” test pit. Thus, “29.01.02 & 29.01.02 Ext SE” stand out from the other units in lithic assemblage. In Figure 6.18 each bullet corresponds then from left to right to test pits 29.01.01, “29.01.02 and 29.01.02 Ext SE”, and 29.01.03

If one separates the above sample into debitage (Table 6.46) and modified pieces (Table 6.47), the results are 82.38% (n=201) to 17.62% (n=43), or a ratio of 1:0.21. This ratio is consistent with that observed from the Intensive Surface Collections areas at this site (1:0.03 and 1:0.39, or averaged to 1:0.21).

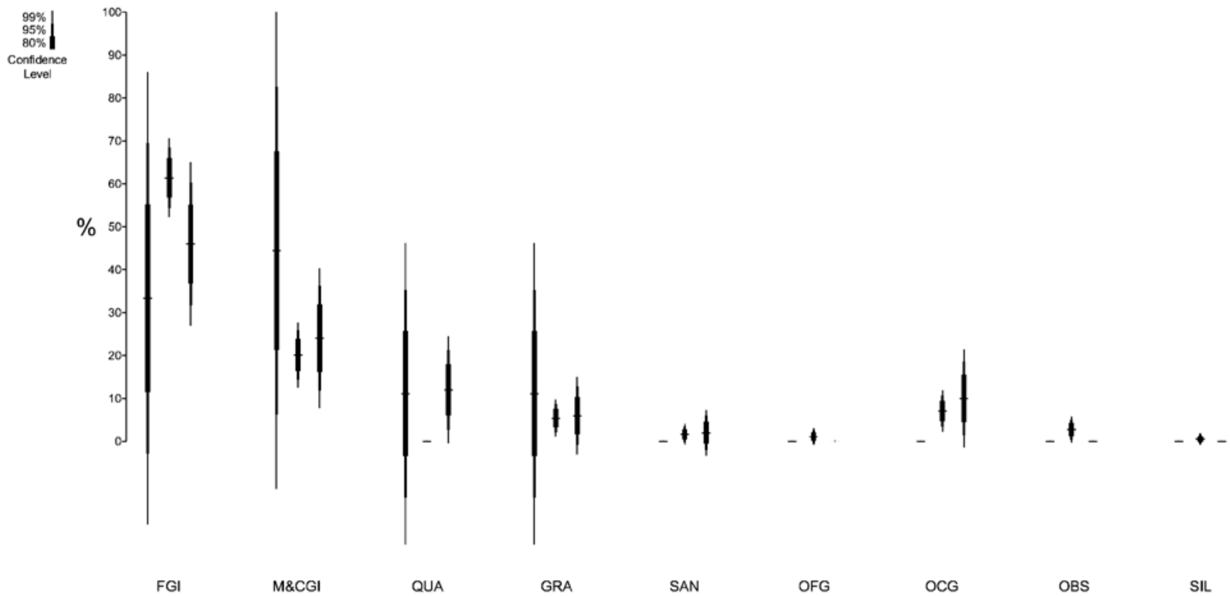

Figure 6.18 Proportions of lithic raw materials per test pit at P29-1

Table 6.46 Debitage by raw material per test pit at P29-1

Test Pit	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
29.01.01	42.86	28.57	14.29	14.29						7
29.01.02	71.21	18.18		7.58		3.03				66
29.01.02 Ext SE	58.02	24.69		3.70	1.23		8.64	2.47	1.23	81
29.01.03	43.48	26.09	13.04	6.52			10.87			46
29.01.04		100.00								1
Total	58.21	23.38	3.48	5.97	0.50	1.00	5.97	1.00	0.50	201

Table 6.47 Modified pieces by raw material per test pit at P29-1

Test Pit	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
29.01.01		100.00								2
29.01.02	58.33						25.00	16.67		12
29.01.02 Ext SE	48.00	20.00		8.00	8.00		12.00	4.00		25
29.01.03	75.00				25.00					4
Total	51.16	16.28		4.65	6.98		13.95	6.98		43

Among the debitage, nine raw materials are represented, while among the classifiable tools, three categories (quartz, Other Fine Grain, and Siliceous) are absent. For both debitage and tools, local igneous rock is the most common. Although the sample yielded significant amounts of quartz and granite debitage, no quartz or granite tools were recovered. This difference likely relates to tool function; granite and sandstone are less likely to be chipped, while polished and pecked tools are manufactured mostly or exclusively in coarse grain raw materials (Medium-and Coarse Grain Rocks, Granite, Sandstone, and Other Coarse Grain Rocks) (Table 6.48).

Table 6.48 Lithic tool categories and cores by raw material at P29-1

Tool category	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
Cores	11	2					1			14
Knapped tools	6	3					1	3		13
Polished tools	5	1		1	3		3			13
Pecked tools		1		1			1			3
Total	22	7		2	3		6	3		43

Table 6.49 Cores and debitage by raw material at P29-1

Lithics type	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
Cores	11	2					1			14
core debitage	77	42	7	11	1	1	8		1	148
marginal reduction debitage	27	5		1		1				34
bifacial reduction debitage	6							2		8
bifacial retouch debitage	1									1
indeterminate	6						4			10
Total	128	49	7	12	1	2	13	2	1	215

The Table 6.49 shows an absence of any cores for six of the raw material groups, although further stages in the manufacture process are represented in the debitage. Granite, quartz, and sandstone can be excused by their use for polished and pecked lithics, and obsidian and Siliceous rock are rare imports. Overall, therefore, the core representation in the assemblage suggest that a “tool producing and tool using” assemblage at the site, rather than a just a tool using assemblage.

Table 6.50 Cores and debitage per test pit and levels

<table>
<tr><th>Test Pit</th><th colspan="2">Cores</th><th colspan="2">core debitage</th><th colspan="2">marginal reduction debitage</th><th colspan="2">bifacial reduction debitage</th><th colspan="2">bifacial retouch debitage</th><th>n</th></tr>
<tr><td></td><td>depth</td><td>#</td><td>depth</td><td>#</td><td>depth</td><td>#</td><td>depth</td><td>#</td><td>depth</td><td>#</td><td></td></tr>
<tr><td>29.01.01</td><td>-</td><td>-</td><td>20-60</td><td>7</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>7</td></tr>
<tr><td rowspan="3">29.01.02</td><td>0-10</td><td>2</td><td rowspan="3">0-85</td><td rowspan="3">43</td><td>0-40</td><td>12</td><td rowspan="3">0-30</td><td rowspan="3">4</td><td rowspan="3">0-10</td><td rowspan="3">1</td><td rowspan="3">70</td></tr>
<tr><td>20-30</td><td>1</td><td rowspan="2">50-90</td><td rowspan="2">6</td></tr>
<tr><td>70-80</td><td>1</td></tr>
<tr><td>29.01.03</td><td>20-30</td><td>1</td><td>0-50</td><td>35</td><td>0-40</td><td>7</td><td>10-20</td><td>1</td><td>-</td><td>-</td><td>44</td></tr>
<tr><td>29.01.04</td><td>-</td><td>-</td><td>10-20</td><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td></td><td>1</td></tr>
<tr><td rowspan="6">29.01.02
Ext SE</td><td>0-10</td><td>2</td><td rowspan="3">0-40</td><td rowspan="3">29</td><td>0-10</td><td>3</td><td rowspan="3">10-20</td><td rowspan="3">1</td><td rowspan="6">-</td><td rowspan="6">-</td><td rowspan="6">83</td></tr>
<tr><td>30-40</td><td>1</td><td rowspan="2">30-40</td><td rowspan="2">1</td></tr>
<tr><td>40-50</td><td>1</td></tr>
<tr><td>50-60</td><td>1</td><td rowspan="3">40-100</td><td rowspan="3">33</td><td>50-60</td><td>2</td><td rowspan="3">60-80</td><td rowspan="3">2</td></tr>
<tr><td>60-70</td><td>3</td><td rowspan="2">70-90</td><td rowspan="2">3</td></tr>
<tr><td>80-90</td><td>1</td></tr>
<tr><td>Total</td><td></td><td>14</td><td></td><td>148</td><td></td><td>34</td><td></td><td>8</td><td></td><td>1</td><td>205</td></tr>
</table>

Lithic debitage of some form is present in almost all levels of each test pit (Table 6.50). All test pits have core debitage but only one has bifacial retouch debitage. All pits show significant evidence for tool manufacture (in terms of core and core debitage), with the assemblage of 29.01.03 consisting largely of the primary stage of reduction. However, in intensive surface collection, it was 02.29.01 Intensive Surface Collection area – located between test pits 29.01.01 and 29.02.01 – that yielded a high proportion of debitage.

Another way to assess stone tool use is simply to compare relative intensities of involvement by examining sherd:lithic ratios. As can be seen in Table 6.51, the unit that stands out in higher proportion of lithics is 29.01.02, on first glance suggesting that the residents that produced this assemblage were doing more with stone tools (in manufacture or use) than the residents producing the other assemblages. However, the adjoining 29.01.02 Ext SE unit tempers this difference.

Table 6.51 Lithics (debitage and modified pieces) to sherds ratio per test pit at P29-1

Test pit	sherds	All lithics	debitage	modified pieces	All lithics per sherd	Debitage per sherd	Modified pieces per sherd
29.01.01	106	9	7	2	0.08	0.07	0.02
29.01.02	470	78	66	12	**0.17**	**0.14**	**0.03**
29.01.02 Ext SE	941	106	81	25	0.11	0.09	**0.03**
29.01.03	428	50	46	4	**0.12**	**0.11**	0.01
29.01.04	1	1	1	0	1.00	1.00	0.00
Total	1946	244	201	43	0.13	0.10	0.02

The amount of tools recovered at each test pit is insufficient to propose tentative functional differences among the assemblages, either comparing units as a whole, or levels within units (Table 6.52). Therefore, we are not able to test the hypothesis (derived from the patterns observed in the intensive surface collection), that a sector of P29-1 specialized in scraping activities.

Table 6.52 Tools per test pit at P29-1

	Knapped					Polished					Pecked	
Test Pit	multitask tools	Cutting tools	Scraping tools	projectile points	drillers	Mano-hammerstone	Net-sinker	net-sinkers preform	polishers	Polished Indeterminate	Pecked Indeterminate	n
29.01.01	1										1	2
29.01.02	2			1	1				1	3		8
29.01.02 Ext SE	3	2	1	1	1	1	2		3	2		16
29.01.03	1				1			1				3
Total	7	2	1	2	3	1	2	1	4	5	1	29

In sum, the lithic analysis shows very broad similarities among the units in lithic activity, as well as through time. The exception to this is Unit 29.01.02 which had proportionally higher amouns of fine grained stone tool material, as well as the only exotic, long distance trade material. The excavation units provide no evidence for occupational specialization or different emphasis in tool production or use.

6.4.1.5 Faunal Remains A total of 646 bone fragments were recovered from the excavation units. Not surprisingly, the majority of these were from the high artifact density, neighboring 29.01.02 and 29.01.02 Ext SE units (Table 6.53). In looking at relative proportions, it can be observed that units 29.01.01 and 29.01.03 show significantly less animal remains (Table 6.54). This difference may be the result of comparing different types of deposition or midden. The hearth – lens feature in 29.01.02 and 29.01.02 Ext SE could represent a food preparation feature. However – all things being equal – the difference could also indicate a dietary difference, that the site residents producing the units 29.01.01 and 29.01.03 assemblages ate less meat than the residents at the 29.01.02 locale. The following analysis is restricted primarily to the assemblages from the 29.01.02 and 29.01.02 Ext SE test pits.

Table 6.53 Faunal remains per test pit at P29-1

Test Pit	# specimens	%
29.01.01	2	0.31
29.01.02	188	29.10
29.01.02 Ext SE	375	58.05
29.01.03	79	12.23
29.01.04	1	0.15
29.01.06	1	0.15
Total	646	100.00

Table 6.54 Faunal remains to sherds ratio per test pit at P29-1

Test Pit	# sherds	# specimens	Faunal remains per sherd
29.01.01	106	2	**0.02**
29.01.02	470	188	0.40
29.01.02 Ext SE	941	375	0.40
29.01.03	428	79	**0.18**
29.01.04	1	1	1.00
29.01.06	1	1	1.00
Total	1947	646	0.33

The problems in extrapolating from zooarchaeological assemblage to diet are many and thorny, and caution against drawing subjective conclusions. Nonetheless, some observations can be made on the representation of different animals at the site (Table 6.55). The amount and types of fish represented do nothing to challenge the common sense observation that fish was likely an important component of the diet. It is also not surprising, given a plausible AD 1400 abandonment date for the site, that there were no European animals represented in the excavations, although bones of these were found in the surface collections. Somewhat surprising, given their relative seasonal abundance, is the relatively low numbers of otariids and cetaceans represented, particular when compared to terrestrial fauna of similar size such as camelids. This suggests a preference for terrestrial "big meat".

Table 6.55 Faunal remains NISP at P29-1 test pits

Class	Order	Genera	Specie	NISP	%	%
Aves	Indeterminate.			16	2.48	2.63
Aves	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax* sp.	1	0.15	
Chondrichthyes	Indeterminate.			22	3.41	3.72
Chondrichthyes	Chimaeriformes	Callorhinchidae	*Callorhynchus callorhynchus*	2	0.31	
Mammalia	Indeterminate.			247	38.24	44.57
Mammalia	Cetacea			1	0.15	
Mammalia	Artiodactyla			1	0.15	
Mammalia	Artiodactyla	Camelidae		30	4.64	
Mammalia	Carnivora	Otariidae	*Otaria flavescens*?	2	0.31	
Mammalia	Rodentia			7	1.08	
Osteichthyes	Indeterminate.			251	38.85	47.95
Osteichthyes	Batrachoidiformes	Batrachoididae	*Aphos porosus*	28	4.33	
Osteichthyes	Batrachoidiformes	Scorpaenidae	*Sebastes capensis*	9	1.39	
Osteichthyes	Gobiesociformes	Gobiesociedae	*Gobiesox marmoratus*	2	0.31	
Osteichthyes	Gobiesociformes	Gobiesociedae	*Sicyases sanguineus*	4	0.62	
Osteichthyes	Ophidiiformes	Ophidiidae	*Genypterus maculatus*	1	0.15	
Osteichthyes	Perciformes	Bovichthyidae	*Bovichthys chilensis*	1	0.15	
Osteichthyes	Perciformes	Carangidae	*Trachurus symmetricus*	5	0.77	
Osteichthyes	Perciformes	Gempylidae	*Thyrsites atun*	1	0.15	
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus microcirrhis*	2	0.31	
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus variolosus*	1	0.15	
Osteichthyes	Perciformes	Pinguipedidae	*Pinguipes chilensis*	2	0.31	
Osteichthyes	Perciformes	Sciaenidae	*Cilus gilberti*	3	0.46	
Indeterminate.				7	1.08	1.08
Total				646	100.00	100.00

If we turn to more specific indexes, such as the MNI, there is the problem of whether to combining different levels (Grayson 1979). For that reason, the tables 6.56, 6.57, and 6.58 present the data in both combined and uncombined forms. I have made separate tables for 29.01.02 and 29.01.02 Ext SE given the fact that they were the only units that provide specimens identified beyond the level of class.

Table 6.56 Faunal remains NISP and MNI per test pits 29.01.01, 29.01.03, 29.01.04, and 29.01.06 at P29-1

Test Pit	Class	Order	NISP	MNI Level	MNI Test Pit
29.01.01	Aves	Indeterminate.	1	-	-
29.01.01	Mammalia	Indeterminate.	1	-	-
29.01.03	Aves	Indeterminate.	1	-	-
29.01.03	Chondrichthyes	Indeterminate.	7	-	-
29.01.03	Mammalia	Indeterminate.	67	-	-
29.01.03	Osteichthyes	Indeterminate.	4	-	-
29.01.04	Mammalia	Indeterminate.	1	-	-
29.01.06	Mammalia	Indeterminate.	1	-	-
Total			83		

Table 6.57 Faunal remains NISP and MNI per test pit 29.01.02 at P29-1

Class	Order	Genera	Specie	NISP	NMI Level	NMI Test Pit
Aves	Indeterminate.			6	-	-
Chondrichthyes	Indeterminate.			2	-	-
Chondrichthyes	Chimaeriformes	Callorhinchidae	*Callorhynchus callorhynchus*	1	1	1
Mammalia	Indeterminate.			78	-	-
Mammalia	Artiodactyla	Camelidae		9	5	1
Mammalia	Carnivora	Otariidae	*Otaria flavescens*?	1	1	1
Mammalia	Rodentia			1	1	1
Osteichthyes	Indeterminate.			63	-	-
Osteichthyes	Batrachoidiformes	Batrachoididae	*Aphos porosus*	8	4	2
Osteichthyes	Batrachoidiformes	Scorpaenidae	*Sebastes capensis*	4	2	1
Osteichthyes	Gobiesociformes	Gobiesociedae	*Gobiesox marmoratus*	1	1	1
Osteichthyes	Gobiesociformes	Gobiesociedae	*Sicyases sanguineus*	2	2	1
Osteichthyes	Perciformes	Bovichthyidae	*Bovichthys chilensis*	1	1	1
Osteichthyes	Perciformes	Carangidae	*Trachurus symmetricus*	2	2	1
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus microcirrhis*	1	1	1
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus variolosus*	1	1	1
Osteichthyes	Perciformes	Sciaenidae	*Cilus gilberti*	1	1	1
Indeterminate				6	-	-
Total				188		

Table 6.58 Faunal remains NISP and MNI per test pit 29.01.02 Ext SE at P29-1

Class	Order	Genera	Specie	NISP	NMI Level	NMI Test Pit
Aves	Indeterminate.			9	-	-
Aves	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax* sp.	1	1	1
Chondrichthyes	Indeterminate.			12	-	-
Chondrichthyes	Chimaeriformes	Callorhinchidae	*Callorhynchus callorhynchus*	1	1	1
Mammalia	Indeterminate.			99	-	-
Mammalia	Cetacea			1	1	1
Mammalia	Artiodactyla			1	-	-
Mammalia	Artiodactyla	Camelidae		21	7	1
Mammalia	Carnivora	Otariidae	*Otaria flavescens*?	1	1	1
Mammalia	Rodentia			6	3	2
Osteichthyes	Indeterminate.			184	-	-
Osteichthyes	Batrachoidiformes	Batrachoididae	*Aphos porosus*	20	11	6
Osteichthyes	Batrachoidiformes	Scorpaenidae	*Sebastes capensis*	5	3	1
Osteichthyes	Gobiesociformes	Gobiesociedae	*Gobiesox marmoratus*	1	1	1
Osteichthyes	Gobiesociformes	Gobiesociedae	*Sicyases sanguineus*	2	2	1
Osteichthyes	Ophidiiformes	Ophidiidae	*Genypterus maculatus*	1	1	1
Osteichthyes	Perciformes	Carangidae	*Trachurus symmetricus*	3	2	1
Osteichthyes	Perciformes	Gempylidae	*Thyrsites atun*	1	1	1
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus microcirrhis*	1	1	1
Osteichthyes	Perciformes	Pinguipedidae	*Pinguipes chilensis*	2	1	1
Osteichthyes	Perciformes	Sciaenidae	*Cilus gilberti*	2	2	2
Indeterminate				1	-	-
Total				375		

Between 2 and 12 camelids are represented in these two last units (this MNI will drop to 1 - 7 if the units are considered as one). All camelid remains were in the upper portion of the units (10 – 80 cm). The most common fish species identified is *Aphos porosus* with 15 to 8 individuals (or between 12 and 6 in the units are combined). This is a coastal species, living in shallow, sandy, and muddy waters.

The ubiquity index analysis of the stratigraphic representation of the different species is presented in Table 6.59. This analysis reinforces the importance of camelids and *Aphos porosus* remains in these two units and, very probably, at the site at large.

Table 6.59 Faunal remains ubiquity at test pits 29.01.02 and 29.01.02 Ext SE at P29-1

Order	Genera	Specie	29.01.02 (9 levels)		29.01.02 Ext SE (12 levels)		Mean Ubiquity
			#	Ubiquity	#	Ubiquity	
Artiodactyla	Camelidae		5	55.56	7	58.33	56.90
Batrachoidiformes	Batrachoididae	*Aphos porosus*	3	33.33	7	58.33	45.83
Batrachoidiformes	Scorpaenidae	*Sebastes capensis*	2	22.22	3	25.00	23.61
Rodentia			1	11.11	4	33.33	22.22
Perciformes	Carangidae	*Trachurus symmetricus*	2	22.22	2	16.67	19.45
Gobiesociformes	Gobiesociedae	*Sicyases sanguineus*	2	22.22	2	16.67	19.45
Chimaeriformes	Callorhinchidae	*Callorhynchus callorhynchus*	1	11.11	1	8.33	9.72
Carnivora	Otariidae	*Otaria flavescens*?	1	11.11	1	8.33	9.72
Perciformes	Labrisomidae	*Auchenionchus microcirrhis*	1	11.11	1	8.33	9.72
Perciformes	Sciaenidae	*Cilus gilberti*			2	16.67	8.34
Perciformes	Bovichthyidae	*Bovichthys chilensis*	1	11.11			5.56
Perciformes	Labrisomidae	*Auchenionchus variolosus*	1	11.11			5.56
Pelecaniformes	Phalacrocoracidae	*Phalacrocorax* sp.			1	8.33	4.17
Cetacea					1	8.33	4.17
Artiodactyla					1	8.33	4.17
Gobiesociformes	Gobiesociedae	*Gobiesox marmoratus*			1	8.33	4.17
Ophidiiformes	Ophidiidae	*Genypterus maculatus*			1	8.33	4.17
Perciformes	Gempylidae	*Thyrsites atun*			1	8.33	4.17
Perciformes	Pinguipedidae	*Pinguipes chilensis*			1	8.33	4.17

Four units provided bones with modifications (n=12). Most of them corresponded to fire exposure and probably butchery marks (Table 6.60). No bone artifacts were recovered from the test pits.

Table 6.60 Bones with modifications per test pit at P29-1

Test Pit	Depth	Class	Order	Family	Bone	Modification
29.01.01	50-60	Mammalia	Indeterminate.		Diafisis	burned
29.01.02	0-10	Mammalia	Indeterminate.		Diafisis	worked?
29.01.02	0-10	Mammalia	Indeterminate.		Diafisis	calcined
29.01.02	50-60	Mammalia	Artiodactyla	Camelidae	Calcaneo	fresh blow
29.01.02	70-80	Mammalia	Artiodactyla	Camelidae	Diafisis	cutting
29.01.02	70-80	Mammalia	Artiodactyla	Camelidae	Radioulna	cutting
29.01.04	10-20	Mammalia	Indeterminate.		Diafisis	calcined
29.01.02 Ext E	20-30	Mammalia	Artiodactyla	Camelidae	Femur Diafisis	blow
29.01.02 Ext E	40-50	Mammalia	Indeterminate.		Vertebrae	puncture
29.01.02 Ext E	50-60	Mammalia	Artiodactyla	Camelidae	Astragalus	calcined
29.01.02 Ext E	50-60	Mammalia	Artiodactyla	Camelidae	Humer	cutting
29.01.02 Ext E	70-80	Aves	Indeterminate.		Femur	burned

6.4.1.6 Paleobotany The flotation column was carried out adjacent to the 29.01.02 test pit. The levels were segregated by 5 cm and reached 80 cm deep. A total of 13317 botanical macro remains were recovered (Table 6.61). These were classified as identified (representing 31 taxa), unidentifiable, and unidentified. The remains were also classified as carbonized (charred) or uncarbonized (uncharred).

Table 6.61 Botanical macro remains at P29-1

Category	Status	n	%
identified	charred	702	5.27%
	uncharred	8214	61.68%
unidentifiable	charred	1460	10.96%
	uncharred	692	5.20%
unidentified	charred	511	3.84%
	uncharred	1738	13.05%
Total		13317	100.00%

As can be seen in the Figure 6.19, botanical remains declined rapidly below the first three levels. A total of 9646 specimens (72.43% of the total sample) were recovered from the first 15 cm. Below Level 3a, the great majority of remains were carbonized. The differential preservation of carbonized remains is shown in Figure 6.20

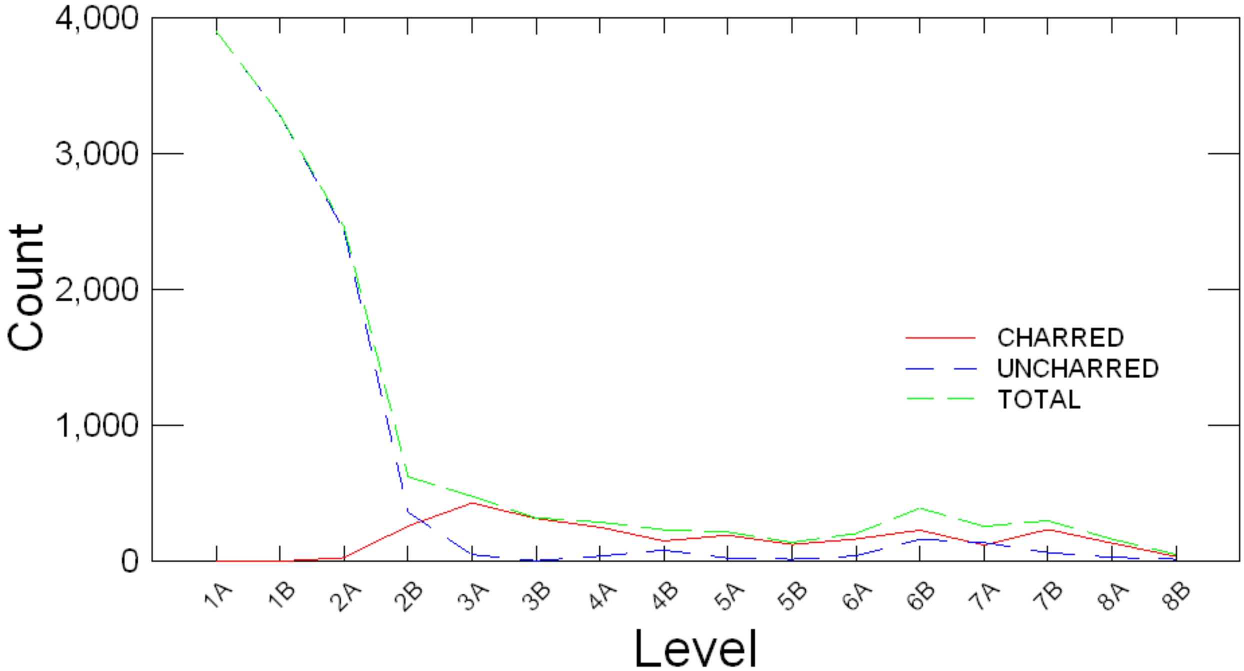

Figure 6.19 Charred and uncharred botanical macro remains per level at P29-1

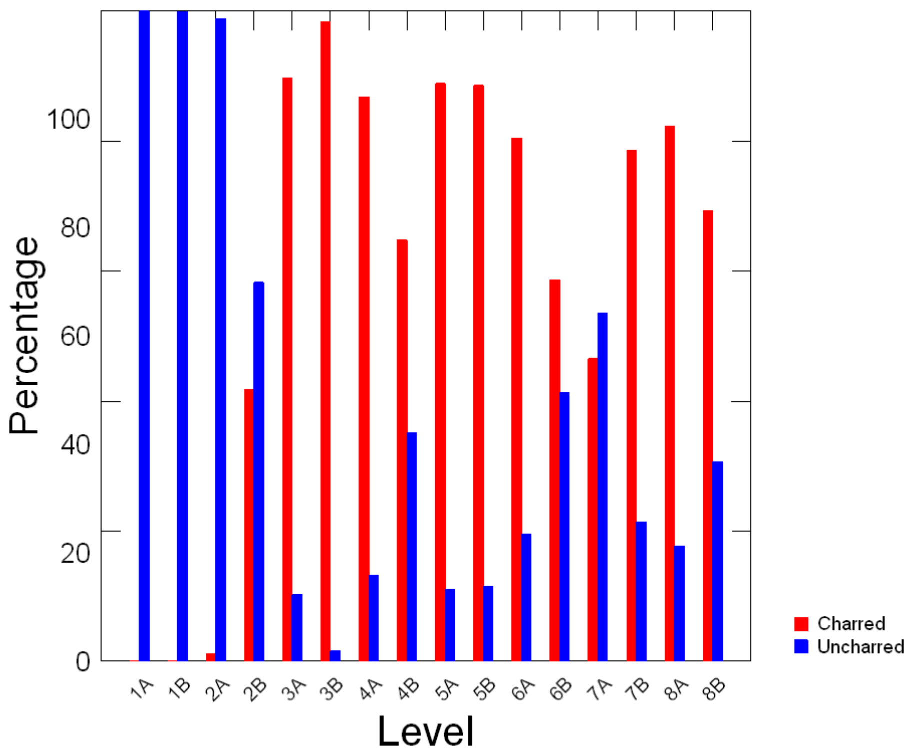

Figure 6.20 Charred versus uncharred botanical macro remains per level at P29-1

Because the wet soil conditions of the research area should have prevented the preservation of non-carbonized botanicals, any non-carbonized remains below 20-30 cm deep, the limit of plowing agriculture, have to be considered modern intrusions (Table 6.62). In fact, many of these specimens do represent post-contact (or even post-1850s) taxa such as *Chenopodium album* or *Raphanus sativus*. Other non-carbonized specimens from deeper contexts, such as *Amaranthus* sp. or Solanaceae, correspond to native species. For these reasons, I have chosen to concentrate in my analysis only on the carbonized remains.

Table 6.62 Uncharred and charred taxa per level at P29-1

TAXA	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	8A	8B	Total	%
Depth (in cm)	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**		
Amaranthus sp. (uncharred)	457	264	113	18	1		3	1	2				10	2	1	2	874	6.56
Aristotelia chilensis (charred)									1								1	0.01
Asteraceae (uncharred)	90	4	1	1						1			3	5		2	107	0.80
Caryophyllaceae (uncharred)	3	3															6	0.05
Chenopodium álbum (uncharred)	1273	1190	521	74	2	1	7	8	2				8	9	4		3099	23.27
Chenopodium quinoa (charred)				22	29	18	13		24	4		9	3	5		3	130	0.98
Chenopodium sp. (charred)				10		2	10	15		1	4	16		19	6	5	88	0.66
Cryptocarya alba (charred)					1			1				1					3	0.02
Fabaceae (charred)										2			1			1	4	0.03
Fragaria aff. *chiloensis* (charred)							2		1	2							5	0.04
Fragaria chiloensis (charred)			1	11	13	1					3	4	4	4			41	0.31
Gevuina avellana (charred)																1	1	0.01
Juncaceae (uncharred)	10	129	505	206	31	3	27	60	14		34	91		17	20		1147	8.61
Luzuriaga radicans (charred)												1					1	0.01
Phaseolus vulgaris (charred)													1				1	0.01
Poaceae (charred)							1	1		1					6		9	0.07
Polygonaceae (charred)					1				1	2		4		1			9	0.07
Polygonaceae (uncharred)	447	238	59	10	3	1		4				1	17	11	1	11	803	6.03
Raphanus sativus (uncharred)	283	147	45	3			1	8				1	11		1		500	3.75

Table 6.62 (continued)

TAXA	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	8A	8B	Total	%
Depth (in cm)	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**		
Rosaceae (uncharred)		1															1	0.01
Rosaceae (charred)				1								1				1	3	0.02
Rubus sp. (uncharred)		3															3	0.02
Rubus sp. (charred)			1	50	74	67	31	24	16	3	26	63	9	20	5	1	390	2.93
Silene gallica (uncharred)	73	73	46	4									1	1			198	1.49
Solanaceae (uncharred)	680	416	320	36	4			1	1		1		10	3	2	1	1475	11.08
Stellaria sp. (uncharred)													1				1	0.01
Typha aff. *angustifolia* (charred)									1								1	0.01
Typha angustifolia (charred)					1	3	1	1		2				2		1	11	0.08
Ugni molinae (charred)												1			1		2	0.02
Zea aff. *mays* (charred)						1											1	0.01
Zea mays (charred)									1								1	0.01
identified (uncharred)	3316	2468	1610	352	41	5	38	82	19	1	35	93	61	48	29	16	8214	61.68
identified (charred)			2	94	119	92	58	42	45	17	33	100	18	51	18	13	702	5.27
unidentifiable (uncharred)	123	354	150	3					1		5	53	3				692	5.20
unidentifiable (charred)			3	121	215	210	172	18	138	73	73	119	97	100	110	11	1460	10.96
unidentified (uncharred)	463	460	674	8	8				4	15		16	74	16			1738	13.05
unidentified (charred)		1	22	45	96	14	21	91	9	34	59	11	5	84	7	12	511	3.84
Total	3902	3283	2461	623	479	321	289	233	216	140	205	392	258	299	164	52	13317	100%

Table 6.63 Charred taxa per level at P29-1

TAXA	**1A**	**1B**	**2A**	**2B**	**3A**	**3B**	**4A**	**4B**	**5A**	**5B**	**6A**	**6B**	**7A**	**7B**	**8A**	**8B**	**Total**	**% Total**
Depth (in cm)	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**		
Aristotelia chilensis									1								1	0.04
Chenopodium quinoa				22	29	18	13		24	4		9	3	5		3	130	4.86
Chenopodium sp.				10		2	10	15		1	4	16		19	6	5	88	3.29
Cryptocarya alba					1			1				1					3	0.11
Fabaceae										2			1			1	4	0.15
Fragaria aff. *chiloensis*							2		1	2							5	0.19
Fragaria chiloensis			1	11	13	1					3	4	4	4			41	1.53
Gevuina avellana																1	1	0.04
Luzuriaga radicans												1					1	0.04
Phaseolus vulgaris													1				1	0.04
Poaceae							1	1		1					6		9	0.34
Polygonaceae					1				1	2		4		1			9	0.34
Rosaceae				1								1				1	3	0.11
Rubus sp.			1	50	74	67	31	24	16	3	26	63	9	20	5	1	390	14.59
Typha aff. *angustifolia*									1								1	0.04
Typha angustifolia					1	3	1	1		2				2		1	11	0.41
Ugni molinae												1			1		2	0.07
Zea aff. *mays*						1											1	0.04
Zea mays									1								1	0.04
Identified			2	94	119	92	58	42	45	17	33	100	18	51	18	13	702	26.26
unidentifiable			3	121	215	210	172	18	138	73	73	119	97	100	110	11	1460	54.62
unidentified		1	22	45	96	14	21	91	9	34	59	11	5	84	7	12	511	19.12
Total	0	1	27	260	430	316	251	151	192	124	165	230	120	235	135	36	2673	100%

When the macrobotanical sample is reduced just to charred remains, the total amount of specimens becomes 2673 (Table 6.63). The identified remains were 702 (26.26%), corresponding to 19 taxa. Unidentifiable specimens numbered 1460 (54.62%), and the unidentified, 511 (19.12%).

Identified specimens include crops (*Chenopodium quinoa*, *Phaseolus vulgaris*, and *Zea mays* –and probably Zea aff. mays), trees (*Aristotelia chilensis*, *Cryptocarya alba*, *Gevuina avellana*), shrubs (*Ugni molinae*), vines (*Luzuriaga radicans*), and herbs (*Fragaria chiloenesis*, *Rubus* sp., *Typha angustifolia*) with edible parts. Obviously, some of these plants, or parts of the plants, had economic uses such as firewood, fibers, and construction material, and do not inform about diet.

The Poaceae, Polygonaceae, Rosaceae, and Fabaceae taxa represent a variety of native species, not all of them with known edible parts or known economic uses. A possible native cultigen is represented by the Poaceae, which includes members of the *Bromus* genus. Some species of this genus (*Bromus mango*, *Bromus berteroanus*, *Bromus catharticus*) were native prehispanic cultivars.

Trying to approach this information in a more quantitative way, I opted to use the ubiquity index (below). This index will be useful then to compare the P29-1 site data with those from P31-1. I explored two scenarios, one considering all 16 levels (Table 6.64), and another which excludes the 3 upper levels (Table 6.65). The rationale for this is that those 3 levels likely represent post-1850s deposit.

Table 6.64 Charred botanical macro remains ubiquity (16 levels)

Taxa	# of levels 1A-8B (16)	Ubiquity
Rubus sp.	14	87.50
Chenopodium quinoa	10	62.50
Chenopodium sp.	9	62.50
Fragaria chiloensis	8	50.00
Typha angustifolia	7	43.75
Polygonaceae	5	31.25
Poaceae	4	25.00
Fragaria aff. *chiloensis*	3	18.75
Cryptocarya alba	3	18.75
Fabaceae	3	18.75
Rosaceae	3	18.75
Ugni molinae	2	12.50
Aristotelia chilensis	1	6.25
Gevuina avellana	1	6.25
Luzuriaga radicans	1	6.25
Phaseolus vulgaris	1	6.25
Typha aff. *angustifolia*	1	6.25
Zea aff. *mays*	1	6.25
Zea mays	1	6.25

Table 6.65 Charred botanical macro remains ubiquity (13 levels)

Taxa	# of levels 2B-8B (13)	Ubiquity
Rubus sp.	13	100.00
Chenopodium quinoa	10	76.92
Chenopodium sp.	9	69.23
Fragaria chiloensis	7	53.85
Typha angustifolia	7	53.85
Polygonaceae	5	38.46
Poaceae	4	30.77
Fragaria aff. *chiloensis*	3	23.08
Cryptocarya alba	3	23.08
Fabaceae	3	23.08
Rosaceae	3	23.08
Ugni molinae	2	15.38
Aristotelia chilensis	1	7.69
Gevuina avellana	1	7.69
Luzuriaga radicans	1	7.69
Phaseolus vulgaris	1	7.69
Typha aff. *angustifolia*	1	7.69
Zea aff. *mays*	1	7.69
Zea mays	1	7.69

In both scenarios the prevalent taxa are *Rubus* sp., followed by *Chenopodium quinoa*, *Chenopodium* sp, and *Fragaria chiloensis*. This ranking would change a little bit if we combined the affine taxa with these taxa. Indeed, there is some sense in doing this, because in the levels in which the specific species were identified lacked the affine taxa, and vice versa. If we combined specific identifications with the affine taxa, the value for *Fragaria chiloensis* would be 68.75 (16 levels) and 76.92 (13 levels); for *Typha angustifolia*, 50.00 (16 levels) and 61.54 (13 levels); and for *Zea mays*, 12.50 (16 levels) and 15.38 (13 levels).

In a chronological sense, and considering the 14C dates, the column reveals for the temporal block AD 1050-1400 that the main staple was probably quinoa. During this same period, maize and beans appeared, but in low proportions. Along with this cultivation was the use of wild resources corresponding to native trees, shrubs, creepers, and herbs.

Additionally, if one considers that the plowing disturbed the first 30 cm of deposit, these levels (0-30 cm deep, or 1A to 3B) could be proposed as representing the post-AD 1400 situation. In fact, the stock of species represented does not differ from that in the lower (sub-30 cm deep) levels.

Beyond that, it is noteworthy of mention the sudden disappearance of native crops –quinoa and maize- and the almost exclusively presence of uncharred remains from the Level 2A (included) and upwards. This is an aspect that touches in the specific taphonomic processes that experimented the archaeobotanical remains at this site, a goal that is beyond this project's goals. In fact, if one discards the disturbing effect of plowing one is tempted to propose that, from an exclusive archaobotanical perspective, the native occupation reached up to Level 2B (inclusive). Therefore, Level 2A and upwards should correspond exclusively to post-AD 1687 –or even, post-AD1850- times.

6.4.1.7 P29-1 Excavation Summary Test units were placed in residential refuse areas. No structure remains were encountered, but a hearth/lens feature was partially excavated in Units 29.01.02 and 29.01.02 Ext SE. The deep occupational stratigraphy in the units at the center of the site, compared to the more shallow occupations at the margin of the site, suggest the site expanded through time, particularly in the latter stages of its occupational span of AD 900 and 1400. Intra-site variability in artifact assemblages (ceramics, lithics) overall, was quite limited; we found no marked wealth/status related differences.

However, Units 29.01.02 and 29.01.02 Ext SE displayed relatively higher proportions of High Investment pottery and higher proportions of fine grain stone tool material, as well as the only imported tool material. It is also possible that the residents contributed to these assemblages ate more meat (particularly camelid) than residents contributing the assemblages of other units. Thus we can identify this zone in the site as a "relatively high status" loci. There were no marked changes through time in the artifact assemblages, save for increased consumption of camelid (in Units 29.01.02 and 29.01.02 Ext SE), after about 1000 AD.

6.4.2 P31-1 Excavation

This site was subject of stratigraphic excavations as part of Quiroz's several projects. In 1991-92, two 2 x 2 m units were excavated. One of these units (1A) was located roughly midway between my test pits 31.02.01 and 01.02.02. Quiroz's second unit (2A) was located between these, and my test pit 31.02.01. In 1995-96, another two 2 x 2 m units (2B and 2C) were dug adjacent to the 2A. About the same time, a test pit program of 19 test pits (50 x 50 cm units) were placed around the area delineated by my later test pits: 01.01.02, 01.02.02, 31.02.02, 31.02.04, and 31.02.01 Finally in 2001 Quiroz dug another two 2 x 2 m units (3B and 3C) in the same area than 2A, 2B, and 2C. Only the 1991-92 excavations have been published (Sánchez et al 1994; Sánchez 1997; Sánchez et al 2004).

As reported, the 1991-92 excavations exposed three main strata (A, B, and C) at the site. The A stratum (0-35 cm depth) contained human remains and large vessel sherds (interpreted as burial urns fragments). This stratum also yielded rare painted Red Over White ceramics. Its chronological position has been assigned to the 16th and 17th centuries. Quiroz's B stratum (35-85 cm) uncovered post holes and a highest proportion of red painted (slipped?) and Red Over White sherds. Radiocarbon dates place this layer into the 14th and 15th centuries. Finally, the C stratum (85-115 cm) revealed post-holes and oven-like structures surrounded by abundant charcoal remains. These latter have been interpreted as ceramic kilns. Although diagnostic El Vergel ceramics were not found in this layer, the C14 dates place it in the 12th and 13th centuries.

As part of my project, 17 50 x 50 cm test pits were excavated at this site. They were distributed in order to cover the entire site surface that was identified and delimited by the survey on the basis of high surface artifact density (Figure 6.21 and Table 6.66). Additionally, a 35 x 35 cm flotation column was made adjacent to the 31.02.01 test pit

6.4.2.1 Location and stratigraphy 01.01.01 is located in a non-cultivated area covered by short grass. The entire deposit is a loam clay organic matrix. The first 20 cm presents rootlets, which then disappear. About the 30 cm depth appeared the degraded bed rock. The unit finished up at this point.

01.01.02 was located at the border of a sloping, cultivated potato field. The deposit is a loamy matrix which in the 10-20 cm depth starts to present the meteorized base rock. About the 20-30 cm deep is reached the base. The unit finished up at this point.

01.02.01 is located in a non-cultivated area covered by short grass. The entire deposit was a semi-compact, organic, loam clay organic matrix. There are roots and rootlets and degraded rock in the first 20 cm. Given the low amount of material yielded by the unit, excavation finished up at 30 cm deep.

01.02.02 is located just outside of the field mentioned for 01.01.02. The first 20 cm are a semi-compact loam clay organic matrix with roots and rootlets. It was not possible to go beyond that depth, since after a heavy rain the test pit became inundated.

01.03.01 is located in a non cultivated area covered by short grass. The entire deposit is a semi-compact loam clay organic matrix with rootlets. At the 20 cm deep there is more presence of shells. Given the low amount of material yielded by the unit it is finished up at the 40 cm deep.

01.03.02 is located in a non cultivated area covered by short grass. The first 10 cm is a semi-compact clayey matrix with rootlets. Then it becomes less compact and with a great contribution of shells. From the 20 cm deep downwards is turns a loam clayey shell midden deposit. Given the low amount of material yielded by the 30 to 50 cm deep levels, the unit is finished up at the 50 cm deep.

31.01.01 is located in a non cultivated area covered by short grass. The matrix is a compact loamy clay, although the test pit southern sector is less compact and darker. The 30-40 cm level did not yield material, and the excavation was finished up at this last depth.

31.02.01 is located in a small terrace in the slope and covered by high grass. The first 25 cm was a semi-compact organic loam clay. At 25 cm deep, we found an ash ring feature in the southern corner of the unit. The intact feature indicated that disturbance produced by plowing did not reach below this depth. In the 30-40 level we identified a hearth-like feature, filled with gray ash, occupying the NE half of the test pit. This feature continued into the 40-50 level, particularly on the NE side. The matrix was the same as in overlying layers, although more compact and with more shell fragments. In the level 50-60 the hearth-like feature practically disappeared completely; the matrix was the same semi-compact loam clay. Around the 60 cm deep, a soft soil feature appeared in the north corner with the hearth-like feature only visible in the eastern corner. In the 70-80 cm level the hearth-like feature disappeared, but the soft soil feature persisted. We subdivided this level into two layers to reflect an increase in charcoal and a soil color change around the 75 cm depth. In the 80-90 cm level another soft soil feature, similar to that of the north corner, appeared in the south corner. The matrix remained the same, although with more intact shells. The 90-100 cm was similar to the previous one, with the south corner feature disappearing at 98 cm depth. Given the physical difficulty of continuing the excavation into the very wet soil below, the unit was concluded here. The flotation column was taken from the NE side of the unit.

31.02.02 is located in a non cultivated area covered by high grass. The entire deposit is a semi-compact loam clay organic matrix. Between the 10-20 cm depth appears the degraded base rock. The unit finished up at the 20 cm depth.

31.02.03 is located in the slope into the forest. The entire deposit is an organic loam clayey matrix with many roots. Given the fact that the first 30 cm did not yield material the unit was finished up at that depth.

31.02.04 is located near the Camino Nuevo stream. The entire deposit is a semi-compact loam clayey matrix with roots and rootlets. At the 25 cm deep the degraded base rock appears and the unit is finished up at that depth.

31.02.05 is located in a non cultivated area covered by short grass. The entire deposit is a semi-compact loam clayey matrix with roots and rootlets. The unit is finished up at the 30 cm depth given the low amount of material this level yielded in contrast to the previous levels.

31.02.06 is located in a non cultivated area covered by short grass. The entire deposit is a semi-compact loam clayey matrix with many rootlets. Given the low amount of material yielded by the unit it is finished up at the 30 cm deep.

31.02.07 is located in a non cultivated area covered by short grass. The entire deposit is a semi-compact loam clayey matrix. The first 10 cm present abundant rootlets which disappear in the following nine levels. At the same time, the matrix becomes more organic and compact. The unit is finished up at 100 cm deep, in fact the 90-100 cm level yielded very few materials.

31.03.01 is located in a non cultivated area covered by short grass. The entire deposit is a semi-compact loam clayey matrix. Given the low amount of material yielded by the unit it is finished up at the 20 cm deep.

31.03.02 is located near the Camino Nuevo stream. The entire deposit is a semi-compact loam clayey matrix with many rootlets in the first 30 cm. In the level 40-50 cm deep only the upper 2 cm yielded material, for this reason the unit is finished up at the 50 cm depth.

31.03.03 is located in a non cultivated area covered by short grass. The entire deposit is a semi-compact loam clayey matrix with many rootlets in the first 20 cm. The level 30-40 cm provide a low amount of material, and the unit was finished up at the 40 cm depth.

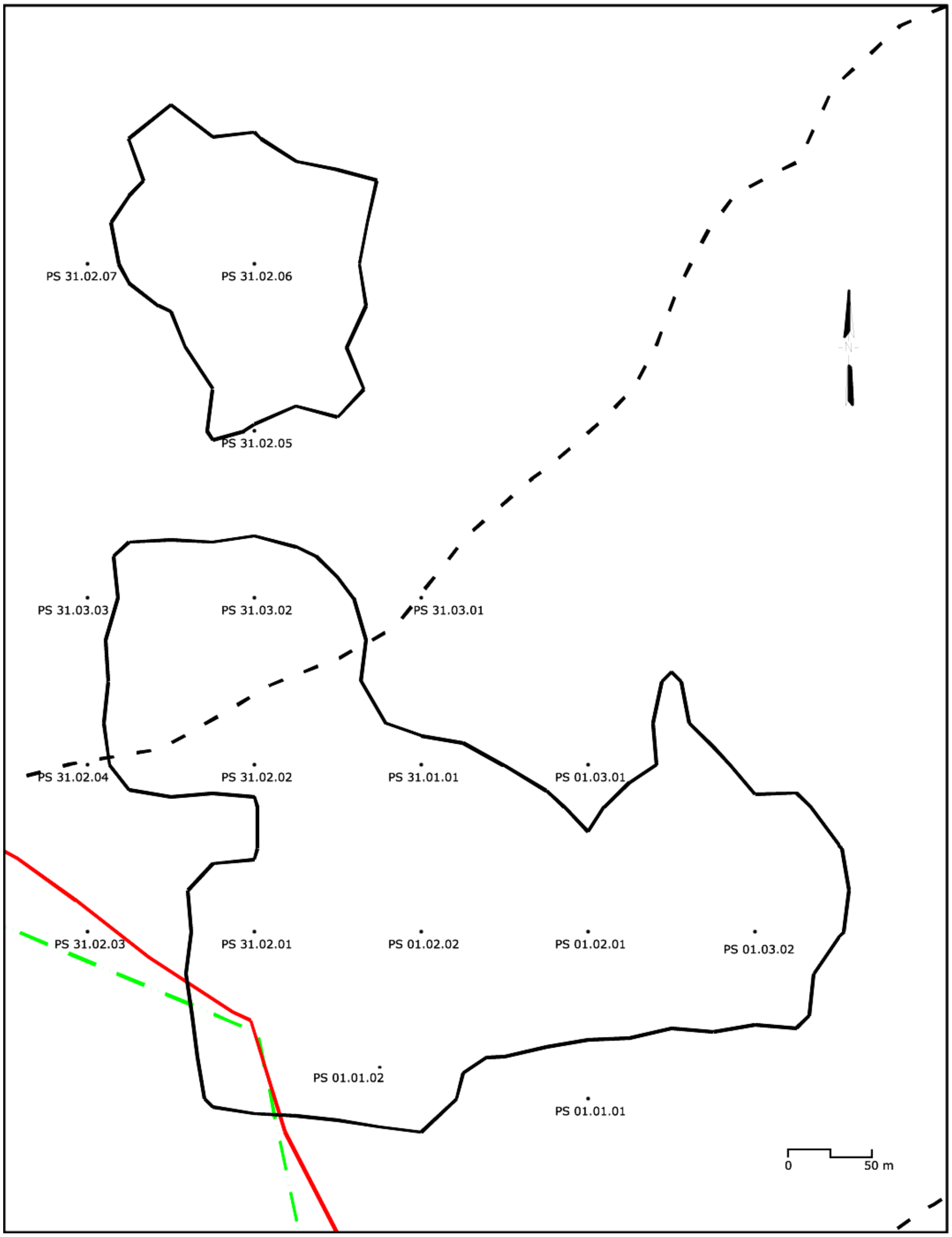

Figure 6.21 Test pits at P31-1 site

Table 6.66 P31-1 test pits summary

Test pit	Coordinate (UTM)	Depth (in cm)	# ceramics	# lithics	# faunal remains	# others	Total	Volume excavated (in liters)	Artifacts per liter
01.01.01	595000 W 5755300 S	30	4				4	75	0.05
01.01.02	594875 W 5755319 S	30	1				1	75	0.01
01.02.01	595000 W 5755400 S	30	10	1	10		21	75	0.28
01.02.02	594900 W 5755400 S	20	8				8	50	0.16
01.03.01	595000 W 5755500 S	40	11	1	2		14	100	0.14
01.03.02	595100 W 5755400 S	50	59	8	2		69	125	0.55
31.01.01	594900 W 5755500 S	40	34		2		36	100	0.36
31.02.01	594800 W 5755400 S	100	456	66	124	23	669	250	**2.68**
31.02.02	594800 W 5755500 S	20	117	14	1		132	50	**2.64**
31.02.03	594700 W 5755400 S	10					0	25	0.00
31.02.04	594700 W 5755500 S	25	2		3		5	62.5	0.08
31.02.05	594800 W 5755700 S	30	60	5			65	75	**0.87**
31.02.06	594800 W 5955800 S	30	11	1			12	75	0.16
31.02.07	594700 W 5755800 S	100	216	38	7	2	263	250	**1.05**
31.03.01	594900 W 5755600 S	20	3			1	4	50	0.08
31.03.02	594800 W 5755600 S	50	143	12			155	125	**1.24**
31.03.03	594700 W 5755600 S	40	12	2		1	15	100	0.15
Total			1147	148	151	27	1473	1662.5	0.89

Artifact densities in the units varied between 0.01 and 2.68 artifacts/liter. Only five units had densities above 0.70 artifacts per liter. If the density per test pit is considered, one can identify an axis of high density material (from 2.82 to 0.87 artifacts per liter) extending from 31.02.01 to 31.02.07, and passing through 31.02.02, 31.03.02, and 31.02.05. This evidence, in fact, supports the finding of the survey that indicated that the site can be divided into two high density sectors.

6.4.2.2 Chronology Four AMS 14C samples were dated for this site, all from the 31.02.01 test pit (Table 6.67 and Figure 6.22).

Table 6.67 P31-1 radiocarbon dates

Sample	Depth	14C Age BP	Cal. Age AD ± 2σ	Δ13C	Material
AA 89421	30-40 cm	408 ± 37	1451 - 1626	-26.0	charcoal
AA 89422	50-60 cm	519 ± 37	1399 - 1460	-24.0	charcoal
AA 89423	75-80 cm	334 ± 34	1495 - 1652	-24.0	charcoal
AA 89424	90-100 cm	826 ± 27	1214 - 1280	-25.7	charcoal

These dates place the occupation of this site from around AD 1200 up to roughly the depopulation (AD 1685-1687). I consider the 8A level (75-80cm) date to represent a dating of intrusive material. My dates are stratigraphically consistent with the 11 previous dates available for this site, which already set it between around 1050 and 1625 (Quiroz pers. com., Sánchez 1997, Sánchez et al 1994, 2004). In the case of the 31.02.01 test pit, plowing affected only the latest deposits, so that materials in the 0-20 cm depth can be confidently assigned to the 16th and 17th centuries.

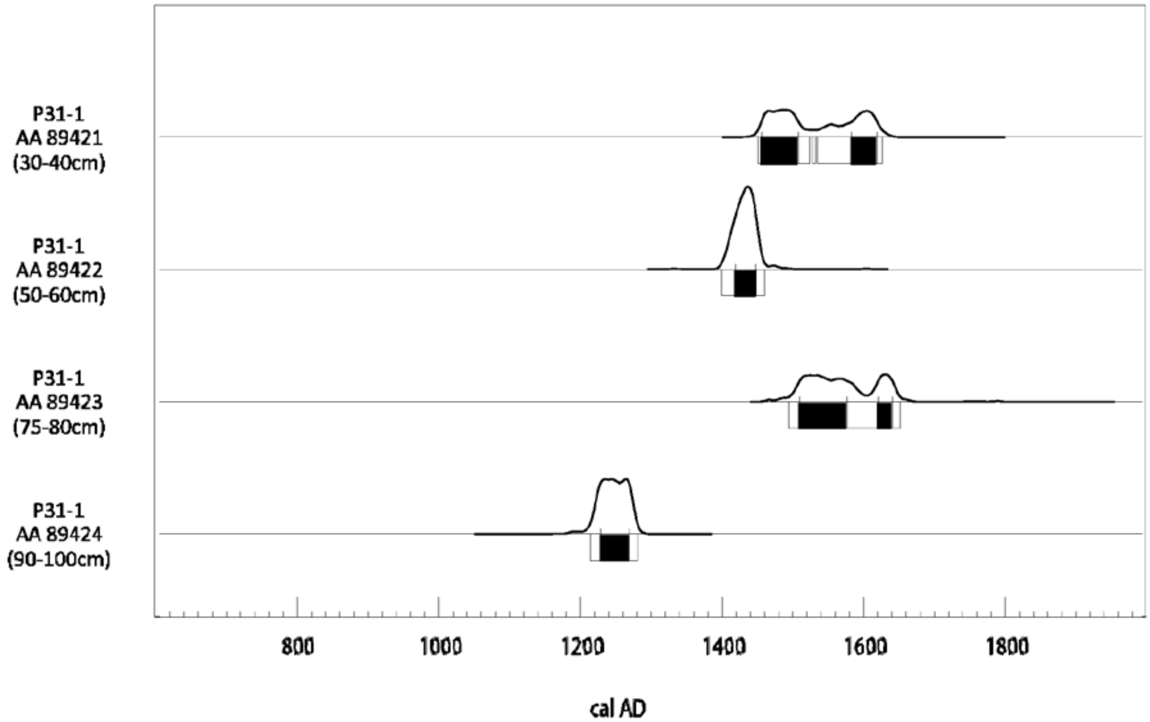

Figure 6.22 Plot for P31-1 radiocarbon dates

6.4.2.3 Ceramics A total of 1147 ceramics were obtained from the 16 test pits. Of these, only 4 test pits yielded more than 100 sherds, while 9 test pits produced less than 20 sherds.

Of these 1147 sherds, 975 sherds (85%) were suitable for the "Finishing Investment index" analysis. The provenience for those sherds is: 01.03.01 (n=11), 01.03.01 (n=45), 31.01.01 (n=33), 31.02.01 (n=42), 31.02.02 (n=57), 31.02.05 (n=58), 31.02.06 (n=11), 31.02.07 (n=12), 31.03.02 (n=34), and 31.03.03 (n=11). I also exclude from analysis those test pits that produced less than 10 sherds (01.01.01 n=3; 01.01.02 n=1; 01.02.01 n=6; 01.02.02 n=5; 31.02.04 n=2; and 31.03.01 n=3). Ultimately, the analysis presented here uses 10 test pits.

The 975 sherds were classified as: Low (n=640, 65.64%), Medium (n=175, 17.95%), and High (n=160, 16.41%) investment. As could be expected, the Low Investment ceramics are the most common, and the High Investment ceramics least common. However, only the Low Invesment sherds showed a mean difference at more than 99%confidence level from the other two groups. Meanwhile, the Medium and Low Investment sherds presented a difference between them at less than 80% confidence level (Figure 6.23).

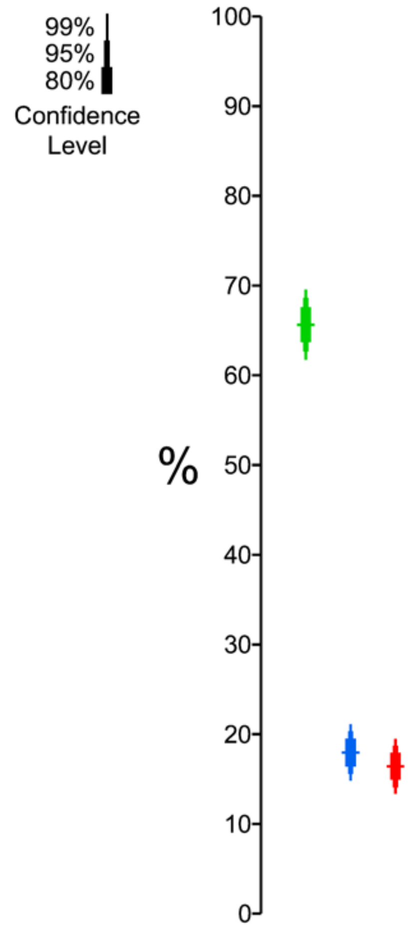

Figure 6.23 Proportions of ceramic Finishing Investment types at P31-1 test pits

Next I compare the proportions across the different excavation levels at each test pit. In some cases I combined stratigraphic levels in order to achieve samples of at least 10 sherds, or to integrate levels with very few sherds to either the upper lying or underlying level. In this way, I ended with 31 “stratigraphic units” (Figure 6.24). The tables 6.68, 6.69, and 6.70 present information on which levels were proportionally above or below the site mean, and the confidence level for each one of those estimates.

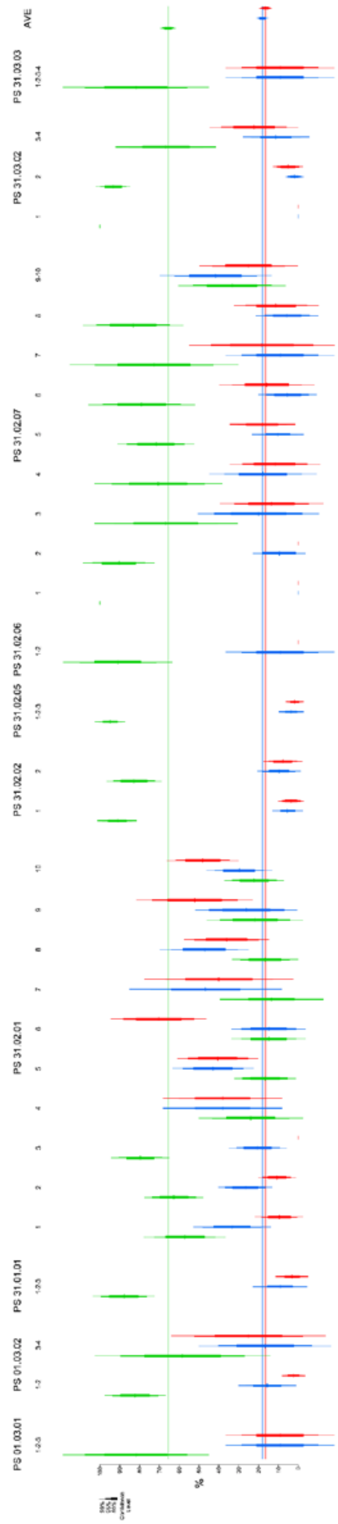

Figure 6.24 Proportions of ceramic Finishing Investment types per test pit stratigraphic unit at P31-1

Table 6.68 Low Investment sherds confidence levels per test pit stratigraphic unit at P31-1

Above the mean				Below the mean			
> 99% CL	**> 95% and < 99% CL**	**> 80% and < 95% CL**	**< 80% CL**	**< 80% CL**	**> 80% and < 95% CL**	**> 95% and < 99% CL**	**> 99% CL**
01.03.02 Levels 1-2 31.01.01 Levels 1-2-3 31.02.02 Level 1, 2 31.02.05 Levels 1-2-3 31.02.07 Levels 1, 2 31.03.02 Levels 1, 2	31.02.01 Level 3 31.02.06 Levels 1 and 2	01.03.01 Levels 1-2-3 31.02.07 Level 6, 8 31.03.03 Levels 1-2-3-4	31.02.07 Levels 3, 4, 5, 7 31.03.02 Levels 3-4	01.03.02 Level 3-4 31.02.01 Level 1, 2			31.02.01 Levels 4, 5, 6, 7, 8, 9, and 10 31.02.07 Levels 9-10

Table 6.69 Medium Investment sherds confidence levels per test pit stratigraphic unit at P31-1

Above the mean				Below the mean			
> 99% CL	> 95% and < 99% CL	> 80% and < 95% CL	< 80% CL	< 80% CL	> 80% and < 95% CL	> 95% and < 99% CL	> 99% CL
31.02.01 Levels 5, 8	31.02.01 Levels 1, 7 31.02.07 Level 9-10	31.02.01 Levels 2, 4, 10	31.02.01 Levels 3, 9 31.02.07 Level 3	01.03.01 Levels 1-2-3 01.03.02 Levels 1-2, 3-4 31.02.01 Level 6 31.02.06 Level 1-2 31.02.07 Level 2, 4, 7 31.03.02 Levels 3-4 31.03.03 Levels 1-2-3-4	31.01.01 Levels 1-2-3 31.02.07 Levels 5	31.02.02 Level 2 31.02.07 Levels 6, 8	31.02.02 Level 1 31.02.05 Level 1-2-3 31.02.07 Level 1 31.03.02 Level 1, 2

Table 6.70 High Investment sherds confidence levels per test pit stratigraphic unit at P31-1

Above the mean				Below the mean			
> 99% CL	> 95% and < 99% CL	> 80% and < 95% CL	< 80% CL	< 80% CL	> 80% and < 95% CL	> 95% and < 99% CL	> 99% CL
31.02.01 Level 5, 6, 9, 10	31.02.01 Level 8	31.02.01 Level 4, 7	01.03.02 Levels 3-4 31.02.07 Level 5, 7, 9-10 31.03.02 Levels 3-4	01.03.01 Levels 1-2-3 31.02.07 Level 3, 4, 6, 8 31.03.03 Levels 1-2-3-4	31.02.01 Levels 1, 2	31.02.02 Level 2	01.03.02 Levels 1-2 31.01.01 Levels 1-2-3 31.02.01 Level 3 31.02.02 Level 2 31.02.05 Levels 1-2-3 31.02.06 Levels 1-2 31.02.07 Levels 1 and 2 31.03.02 Level 1, 2

This analysis shows dramatically that Levels 4 – 10 of Unit 31.02.01 are the only ones that present significantly (above 80% confidence level) high proportions of High Investment ceramics. The proportion of this pottery declined in Levels 1 to 3. This proportion of High Investment sherds distinguishes this test pit from the remaining test pits at this site, and is a persistent difference because Levels 4 – 10 correspond to roughly AD 1214 to AD 1626.

In contrast, Unit 31.02.06, a very shallow unit (20 cm) displayed very significantly high proportions of Low Investment sherds, very significant low proportions of Medium Investment sherds, and no High Investment sherds at all. Units 31.02.05 and 31.02.02 are close to this pattern. The other test units fall in between these two extremes, although Unit 31.02.07 (also a very deep unit (100 cm) has a pattern very similar to Unit 31.02.06. Therefore, the differences in proportions of High Investment pottery among the units are not simply a reflection of a site-wide diachronic trend.

The units can also be looked at in terms of presence/absence. High Investment ceramics were absent from only 5 stratigraphic units: 31.02.01 (level 3), 31.02.06 (levels 1-2), 31.02.07 (levels 1 and 2), and 31.03.02 (level 1). Medium Investment ceramics were absent on 2 units: 31.02.07 (level 1) and 31.03.02 (level 1). Low Investment ceramics were present in all units.

I believe that the absence of High – or even Medium - investment sherds in the upper levels at 31.02.06, 31.02.07, and 31.03.02, can be interpreted as showing an "impoverishment" of some sectors of the site's population in the last stages of the site's occupation. At the same time, unit 31.02.01 witnessed a decrease in High Investment sherds proposrtion in its upper levels (1-3). According to the dates, those levels should not be earlier than AD 1450. Therefore this "impoverishment" is reflecting something that occurred in late prehistoric or during early historic times. A similar situation was already indicated for P29-1.

A total of 1965 tempers were readily visible on 1145 sherds (Table 6.71). Eight different tempers were defined for P31-1 sherds. Most sherds presented more than one temper, and 48 combinations were identified.

Table 6.71 Ceramic tempers at P31-1

Temper	# tempers	%
Sand	805	**40.97**
Peebles	349	**17.76**
Shells	315	**16.03**
Quartz	238	12.11
Basalt	225	11.45
Graphite	20	1.02
Silex	12	0.61
Grog	1	0.05
Total	1965	100.00

Of the 1145 sherd sample, 473 (41.31%) presented only one temper, the most common being sand (n=312), followed by pebbles (n=71) and shell (n=42). A total of 537 (46.90%) sherds had two tempers, the most common combinations were sand and shell (n=125) and sand and pebble (n=110). A total of 122 (10.66%) sherds had three tempers, but none of these three combinations were seen in more than 25 sherds. Finally, only 13 sherds (1.14%), displayed 4 tempers.

Most of the sherds were body fragments, making it difficulty to infer functional aspects of the ceramic assemblages (Table 6.72).

Table 6.72 Sherd types per test pit at P31-1

Test Pit	# sherds	Base	Body	Handle	Handle-Body-Rim	Rim	Inflection Point
01.01.01	4		100.00				
01.01.02	1		100.00				
01.02.01	10		90.00				10.00
01.02.02	8		87.50				12.50
01.03.01	11		81.82			18.18	
01.03.02	59		88.14			6.78	5.08
31.01.01	34		94.12				5.88
31.02.01	456	0.22	87.50	0.66	0.22	8.77	2.63
31.02.02	117		94.02	0.85		4.27	0.85
31.02.04	2		100.00				
31.02.05	60		91.67	1.67		5.00	1.67
31.02.06	11		81.82			9.09	9.09
31.02.07	216		88.89	1.39		7.41	2.31
31.02.01	3		100.00				
31.03.02	143		93.71			4.20	2.10
31.03.03	12		100.00				
Total	1147	0.09	89.90	0.70	0.09	6.71	2.62

As at P29-1, most of the rims rims were direct, and were likely parts of plates and mugs as well as jars, ollas, bottles, urns, and urn caps (Table 6.73).

Table 6.73 Ceramic rims types per test pit at P31-1

Test Pit	# sherds	Direct	Incurved	Everted	Indeterminate
01.03.01	2	50.00	50.00		
01.03.02	4	100.00			
31.02.01	41	63.41	7.32		29.27
31.02.02	5	80.00	20.00		
31.02.05	3	66.67			33.33
31.02.06	1			100.00	
31.02.07	16	75.00		6.25	18.75
31.03.02	6	83.33		16.67	
Total	78	69.23	6.41	3.85	20.51

Comparison of the ceramic assemblages reveals some significant differences among the units. Foremost among these is the high proportions of High Investment pottery in Unit 31.02.01, through much of the occupational sequence there. In contrast, Unit 31.02.07 and Unit 31.02.06 had low proportions of these ceramics, indicating that the residents contributing to these assemblages were of relatively lower wealth (in household pottery terms), than the residents contributing to the Unit 31.02.01 assemblage.

6.4.2.4 Lithics Only 148 lithics were obtained from the excavations, and most of these (70.27%) came from two tests pits (31.02.01 and 31.02.07). Because of the low density of lithics, I will make comparisons at the unit level, rather than the strata, level.

Table 6.74 Lithic raw materials per test pit at P31-1

Test Pit	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
01.02.01		100.00								1
01.03.01		100.00								1
01.03.02	50.00	25.00		12.50		12.50				8
31.02.01	60.61	25.76	3.03	1.52	1.52		7.58			66
31.02.02	71.43	28.57								14
31.02.05	40.00	60.00								5
31.02.06	100.00									1
31.02.07	34.21	44.74	5.26	15.79						38
31.03.02	66.67	16.67	8.33					8.33		12
31.02.03	100.00									2
Total	54.05	31.76	3.38	5.41	0.68	0.68	3.38	0.68	0.00	148

Local igneous rock was the most common (100% to 75%) tool material in the 10 test pits. In fact, only one fragment of exotic material (obsidian) was found, this from Unit 31.03.02 (Table 6.74). As at P29-1, the excavation assemblages contrast with the surface collection assemblages in that fine Fine Grain Igneous rock is most common in the former, while Medium-and-Coarse Grain Igneous rock is most common in the latter.

In producing the Figure 6.25, I excluded test pits with less than 10 lithics, so that the graph shows (from left to right) only test pits 31.02.01, 31.02.02, 31.02.07, and 31.03.02. Unit 31.02.07 differ dramatically from the other three test pits, with its significantly lower proportion of Fine Grain Igneous rock (at more than 95% confidence level), and high proportion of Granite (at more than 95%confidence level). This unit also displayed a higher proportion of Medium-and-Coarse Grain Igneous rock (at more than 95%confidence level) than Units 31.02.01 and 31.03.02.

That Unit 31.02.07 stands out in having presumably lower value stone tool making material, is consistent with the ceramic assemblages from the unit having significantly higher proportions of Low Investment ceramics than other units. These differences hint at the area of

Unit 31.02.07 and Unit 31.02.06 representing a relatively lower status sector of P31-1. On the other hand, units 31.02.01, 31.02.02, and 31.03.02 are characterized by a higher representation of Fine Grain Igneous Rocks and the unique obsidian piece.

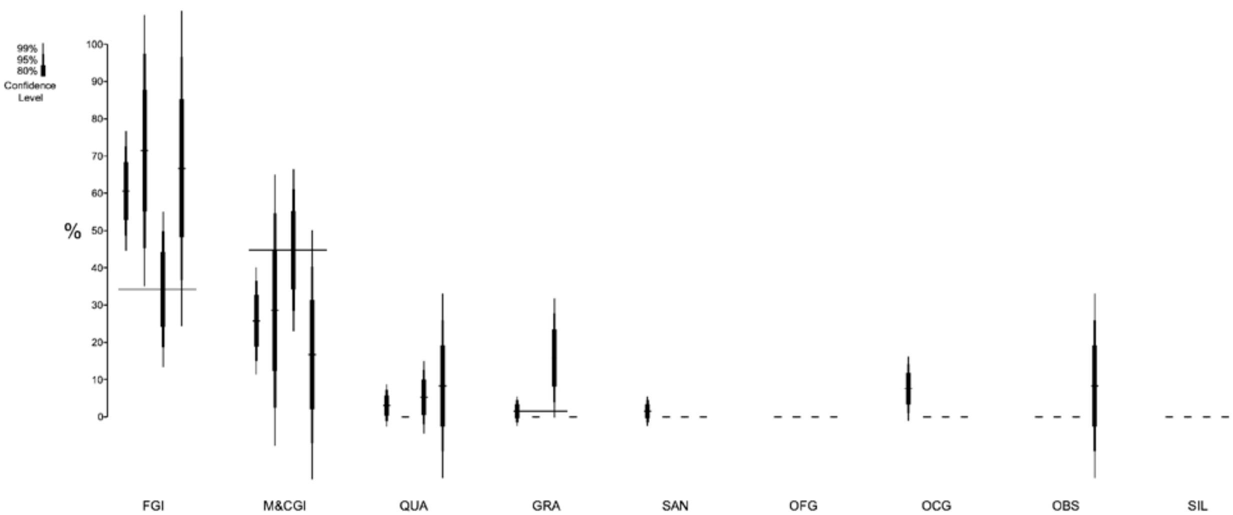

Figure 6.25 Proportions of lithic raw materials per test pit at P31-1

In the total lithic assemblage, 92.57% (n=137) of the specimens are debitage (Table 6.75), and 7.43% (n=11) are modified pieces (Table 6.76), giving a ratio of 1:0.08. This figure is below the 1:0.17 ratio obtained in the intensive surface collection area at this site, so that the excavation assemblages have more debitage per modified piece. In this case, I think the explanation lies in different collection techniques, as only in the excavations was material screened.

Table 6.75 Debitage by raw material per test pit at P31-1

Test Pit	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
01.03.01		100.00								1
01.03.02	60.00	20.00		20.00						5
31.02.01	61.29	25.81	3.23	1.61	1.61		6.45			62
31.02.02	71.43	28.57								14
31.02.05	40.00	60.00								5
31.02.06	100.00									1
31.02.07	33.33	44.44	5.56	16.67						36
31.03.02	72.73	18.18	9.09							11
31.02.03	100.00									2
Total	55.47	31.39	3.65	5.84	0.73	0.00	2.92	0.00	0.00	137

Table 6.76 Modified pieces by raw material per test pit at P31-1

Test Pit	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
01.02.01	100.00									1
01.03.02	33.33	33.33				33.33				3
31.02.01	50.00	25.00					25.00			4
31.02.07	50.00	50.00								2
31.03.02								100.00		1
Total	45.45	27.27				9.09	9.09	9.09		11

Of the nine raw materials identified in this study, only six of them were found in the debitage, and just five in the modified pieces. Quartz, granite, and sandstone were represented in debitage but not in tools.

The small sample size of tools and cores does not make comparisons among the units worthwhile, as any differences will be explainable as a result of the vagaries of sampling (Table 6.77).

Table 6.77 Lithic tool categories and cores by raw material at P31-1

Tool category	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
Cores	2					1				3
Knapped	2	1						1		4
Polished		2					1			3
Pecked		1								1
Total	4	4				1	1	1		11

The only cores from excavation were from Fine Grain Igneous rock and Other Fine Grain rock, although the other raw materials were represented at further stages in the manufacture process (Table 6.78). Quartz may have been used as a pottery temper.

Seven of the 10 test pits yielded core debitage, distributed fairly equally through the test pit levels. The same can be said for the marginal reduction debitage (Table 6.79). Unlike at P29-1, there was next to no bifacial reduction debitage or bifacial retouch debitage in the P31-1 assemblages.

Table 6.78 Cores and debitage by raw material at P31-1

Lithics category	Fine Grain Igneous Rocks	Medium-and-Coarse Grain Igneous Rocks	Quartz	Granite	Sandstone	Other Fine Grain Rocks	Other Coarse Grain Rocks	Obsidian	Siliceous Rocks	n
Cores	2					1				3
core debitage	49	34	5	4	1		4			97
marginal reduction debitage	26	9		4						39
bifacial reduction debitage	1									1
bifacial retouch debitage										0
indeterminate										0
Total	78	43	5	8	1	1	4			140

Table 6.79 Cores and debitage per test pit and levelsat P31-1

<table>
<tr><th>Test Pit</th><th colspan="2">Cores</th><th colspan="2">core debitage</th><th colspan="2">marginal reduction debitage</th><th colspan="2">bifacial reduction debitage</th><th colspan="2">bifacial retouch debitage</th><th>n</th></tr>
<tr><th></th><th>depth</th><th>#</th><th>depth</th><th>#</th><th>depth</th><th>#</th><th>depth</th><th>#</th><th>depth</th><th>#</th><th></th></tr>
<tr><td>01.03.01</td><td>-</td><td>-</td><td>10-20</td><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>1</td></tr>
<tr><td>01.03.02</td><td>10-20</td><td>2</td><td>10-20</td><td>5</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>7</td></tr>
<tr><td rowspan="3">31.02.01</td><td rowspan="3">10-20</td><td rowspan="3">1</td><td>0-20</td><td>13</td><td>10-20</td><td>3</td><td rowspan="3">70-75</td><td rowspan="3">1</td><td rowspan="3">-</td><td rowspan="3">-</td><td rowspan="3">63</td></tr>
<tr><td>30-70</td><td>23</td><td rowspan="2">30-75</td><td rowspan="2">13</td></tr>
<tr><td>75-100</td><td>9</td></tr>
<tr><td>31.02.02</td><td>-</td><td>-</td><td>0-20</td><td>12</td><td>0-20</td><td>2</td><td>-</td><td>-</td><td>-</td><td>-</td><td>14</td></tr>
<tr><td>31.02.05</td><td>-</td><td>-</td><td>0-20</td><td>3</td><td>0-10</td><td>2</td><td>-</td><td>-</td><td>-</td><td>-</td><td>5</td></tr>
<tr><td>31.02.06</td><td>-</td><td>-</td><td>-</td><td>-</td><td>10-20</td><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td>1</td></tr>
<tr><td rowspan="2">31.02.07</td><td rowspan="2">-</td><td rowspan="2">-</td><td>0-50</td><td>20</td><td rowspan="2">10-50</td><td rowspan="2">13</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">-</td><td rowspan="2">36</td></tr>
<tr><td>70-100</td><td>3</td></tr>
<tr><td>31.03.02</td><td>-</td><td>-</td><td>10-40</td><td>8</td><td>10-30</td><td>3</td><td>-</td><td>-</td><td>-</td><td>-</td><td>11</td></tr>
<tr><td>31.03.03</td><td>-</td><td>-</td><td>-</td><td>-</td><td>10-30</td><td>2</td><td>-</td><td>-</td><td>-</td><td>-</td><td>2</td></tr>
<tr><td>Total</td><td></td><td>3</td><td></td><td>97</td><td></td><td>39</td><td></td><td>1</td><td></td><td></td><td>140</td></tr>
</table>

As a measure of the volume or intensity of participation in lithic manufacture/use activities, I use a simple sherd:lithic ratio for comparison. Table 6.80 shows some differences among the units in this regard, with Unit 31.02.07 (the "low value" unit in terms of pottery and stone tool raw material) having the proportionally highest amount of lithics.

Table 6.80 Lithics (debitage and modified pieces) to sherds ratio per test pit at P31-1

Test pit	sherds	All lithics	debitage	modified Pieces	Lithics per sherd	Debitage per sherd	Modified pieces per sherd
01.02.01	10	1	0	1	0.10	0.00	**0.10**
01.03.01	11	1	1	0	0.09	0.09	0.00
01.03.02	59	8	5	3	**0.14**	0.08	0.05
31.02.01	456	66	62	4	**0.14**	**0.13**	0.01
31.02.02	117	14	14	0	0.11	0.11	0.00
31.02.05	60	5	5	0	0.08	0.08	0.00
31.02.06	11	1	1	0	0.08	0.08	0.00
31.02.07	216	38	36	2	**0.18**	**0.17**	0.01
31.03.02	143	12	11	1	0.08	0.07	0.01
31.03.03	12	2	2	0	**0.13**	**0.13**	0.00
Total	1095	148	137	11	**0.14**	**0.13**	0.01

Finally, as indicated, the amount of tools recovered at the site is not enough to indicate any peculiarituy about them, or to propose tentative functional differences between the test pits or different sectors at the site (Table 6.81). Still, it is noteworthy that in this small sample there is not a single knapped multitask tool. On the other hand, the only tool manufactured on exotic raw material –obsidian- correspond to 1 scraper. This was found in the Level 5 (40-50 cm) of the 31.03.02 test pit.

Table 6.81 Tools per test pit at P31-1

	Knapped			Polished			Pecked	
Test Pit	Cutting tools	scrapping tools	projectile point Preform	Polisher	net-sinker	indeterminate	hammerstone	n
01.02.01				1				1
01.03.02						1		3
31.02.01	1	1			1			4
31.02.07			1				1	2
31.03.02		1						1
Total	1	2	1	1	1	1	1	8

6.4.2.5 Faunal Remains A total of 151 faunal bones were recovered from the excavations (from which I have subtracted from analysis three that represent bone tools). As shown in Table 6.82, most of the faunal remains come from Unit 31.02.01, a high density unit. However, the sherd:fauna ratios (Table 6.83) show that, indeed, there is proportionally more bone in this unit than in other units. In contrast, there are very low proportions of bones in Unit 31.02.07. In fact, between between units 31.02.01 and 31.02.07 seems to be an area mostly devoided of faunal remains but not of ceramic sherds.

Table 6.82 Faunal remains per test pit at P31-1

Test Pit	# specimens	%
01.02.01	10	6.76
01.03.01	2	1.35
01.03.02	2	1.35
31.01.01	2	1.35
31.02.01	122	82.43
31.02.04	3	2.03
31.02.07	7	4.73
Total	148	100.00

Table 6.83 Faunal remains to sherds ratio per test pit at P31-1

Test Pit	sherds	# specimens	Faunal remains per sherd
01.02.01	10	10	1.00
01.03.01	11	2	**0.18**
01.03.02	59	2	0.03
31.01.01	34	2	0.06
31.02.01	456	122	**0.27**
31.02.04	25	3	**0.12**
31.02.07	216	7	0.03
Total	811	148	0.18

That the preponderance of bones comes from Unit 31.02.01 means that the assemblages of this unit essentially must be a proxy for characterizing the faunal assemblage at the site as a whole when it comes to taxonomic identifications.

Table 6.84 Faunal remains NISP at P31-1 test pits

Class	Order	Genera	Specie	NISP	%	%
Aves	Indeterminate.			17	11.49	12.84
Aves	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax* sp.	2	1.35	
Chondrichthyes	Indeterminate.			1	0.68	0.68
Mammalia	Indeterminate.			48	32.43	43.93
Mammalia	Artiodactyla	Camelidae	Indeterminate.	5	3.38	
Mammalia	Carnivora	Otariidae	*Otaria flavescens*?	1	0.68	
Mammalia	Cetacea	Indeterminate.		1	0.68	
Mammalia	Perissodactyla	Equidae	*Equus* sp	1	0.68	
Mammalia	Rodentia	Indeterminate.		9	6.08	
Osteichthyes	Indeterminate.			46	31.08	38.52
Osteichthyes	Batrachoidiformes	Batrachoididae	*Aphos porosus*	8	5.41	
Osteichthyes	Batrachoidiformes	Scorpaenidae	*Sebastes capensis*	2	1.35	
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus microcirrhis*	1	0.68	
Indeterminate.				6	4.05	4.05
Total				148	100.00	100.00

Keeping in mind the problems in extrapolating from zooarchaeological assemblage to diet some observations can be made on the representation of different animals at the site (Table 6.84). As with P29-1, fish are well represented. The range of identified fish at P31-1 is smaller than P29-1 (3 species at P31-1, and 13 species at P29-1), although *Aphos porosus* is again the predominant one. Camelids are less well represented here than at P29-1. It is possible that camelid numbers are "hidden" within the number of indeterminate mammal remains, but on the face of it, there is no reason why the faunal assemblage here should be more fragmented than that of P29-1. Again, otariids and cetaceans are not well represented. Although occupation at this site may have run to the time of abandonment, only a single fragment of non-native mammal (a horse bone) was recovered. Rodent bones may represent natural rodent mortality or post-depositional intrusive individuals rather than meals. Again, otariids and cetaceans are not well represented. In contrast to P29-1, birds make at P31-1 a much higher contribution to the faunal assemblage.

Although occupation at this site may have run to the time of abandonment, only a single fragment of non-native mammal (a horse bone) was recovered. In a chronological sense, the presence of *Aphos porosus* and camelids would be covering, at least, a time span that goes from around the AD 1300 to AD 1500.

As was discussed for P29-1 I will use the MNI index in analysis, for both the individual level and test pit (Grayson 1979) (Tables 6.85 and 6.86) I have made a separate table for 31.02.01 given the fact that it was the units that provide specimens identified beyond the level of class

Table 6.85 Faunal remains NISP and MNI per test pits 01.02.01, 01.03.01, 01.03.02, 31.01.01, 31.02.04, and 31.02.07 at P31-1

Test Pit	Class	Order	Genera	Specie	NISP	NMI Level	NMI Test Pit
01.02.01	Mammalia	Indeterminate.			7	-	-
01.02.01	Indeterminate.				3	-	-
01.03.01	Indeterminate.				2	-	-
01.03.02	Mammalia	Indeterminate.			2	-	-
31.01.01	Mammalia	Indeterminate.			2	-	-
31.02.04	Mammalia	Indeterminate.			2	-	-
31.02.04	Mammalia	Perissodactyla	Equidae	*Equus* sp	1	1	1
31.02.07	Mammalia	Artiodactyla	Camelidae	Indeterminate.	1	1	1
31.02.07	Aves	Indeterminate.			1	-	-
31.02.07	Peces	Indeterminate.			1	-	-
31.02.07	Mammalia	Indeterminate.			3	-	-
31.02.07	Indeterminate.				1		
Total					26		

Table 6.86 Faunal remains NISP and MNI per test pit 31.02.01 at P31-1

Class	Order	Genera	Specie	NISP	NMI Level	NMI Test Pit
Aves	Indeterminate.			16	-	-
Aves	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax* sp.	2	2	1
Chondrichthyes	Indeterminate.			1	1	1
Mammalia	Indeterminate.			32	-	-
Mammalia	Artiodactyla	Camelidae	Indeterminate.	4	3	1
Mammalia	Carnivora	Otariidae	*Otaria flavescens*?	1	1	1
Mammalia	Cetacea	Indeterminate.		1	1	1
Mammalia	Rodentia	Indeterminate.		9	5	5
Osteichthyes	Indeterminate.			45		
Osteichthyes	Batrachoidiformes	Batrachoididae	*Aphos porosus*	8	5	1
Osteichthyes	Batrachoidiformes	Scorpaenidae	*Sebastes capensis*	2	2	1
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus microcirrhis*	1	1	1
Total				122		

These results indicate a widespread distribution for *Aphos porosus*. This fish appears intermittently from Levels 5 (40-50 cm) to 10 (90-100 cm) in Unit 31.02.01. The surprisingly low number of camelid bones (MNI of 2 – 4 individuals), is matched by their limited stratigraphic distribution (between 30 and 80 cm).

The ubiquity index analysis (Table 6.87) is consistent with the observations made above, reinforcing the apparent importance at P31-1 of *Aphos porosus*, rodents, and camelids.

Table 6.87 Faunal remains ubiquity at test pits 31.02.01, 31.02.04, and 31.02.07 at P31-1

Order	Genera	Specie	31.02.01 (10 levels)		31.02.04 (2 levels)		31.02.07 (10 levels)		Mean Ubiquity
			#	Ubiquity	#	Ubiquity	#	Ubiquity	
Batrachoidiformes	Batrachoididae	*Aphos porosus*	5	50.00					16.67
Perissodactyla	Equidae	*Equus* sp			1	50.00			16.67
Rodentia	Indeterminate.		4	40.00					13.33
Artiodactyla	Camelidae	Indeterminate.	3	30.00			1	10.00	13.33
Pelecaniformes	Phalacrocoracidae	*Phalacrocorax* sp.	2	20.00					6.67
Batrachoidiformes	Scorpaenidae	*Sebastes capensis*	2	20.00					6.67
Carnivora	Otariidae	*Otaria flavescens*?	1	10.00					3.33
Cetacea	Indeterminate.		1	10.00					3.33
Perciformes	Labrisomidae	*Auchenionchus microcirrhis*	1	10.00					3.33

In my sample there is evidence of fire exposure in indeterminate and mammal remains (n=11). Bones with these characteristics are present in different test pits (01.02.01, 01.03.02, 31.01.01, 31.02.01, 31.02.07), and, at least one of them, was identified as a camelid phalange.

There is also evidence of intentionally crushed bones, what gives support to the large number of indeterminate bones. No cutting marks or carnivore punctures were identified in my sample (Table 6.88).

Table 6.88 Bones with modifications per test pit at P31-1

Test Pit	Depth	Class	Order	Family	Bone	Modification
01.02.01	20-30	Indeterminate.			Diafisis	calcined
01.02.01	20-30	Indeterminate.			Epifisis	Calcined
01.02.01	20-30	Indeterminate.			Diafisis	Calcined
01.03.02	40-50	Mammalia	Indeterminate.		Epifisis	Calcined
31.01.01	10-20	Mammalia			Diafisis	Calcined
31.02.01	75-80	Mammalia	Artiodactyla	Camelidae	Phalanx	Carbonized
31.02.01	80-90	Mammalia	Indeterminate.		Diafisis	Calcined
31.02.01	90-100	Mammalia	Indeterminate.		Diafisis	Burned
31.02.01	0-10	Mammalia	Indeterminate.		Diafisis	Burned
31.02.07	90-100	Indeterminate.			Diafisis	calcined
31.02.07	60-70	Mammalia	Indeterminate.		Diafisis	burned

Finally, a handful of bone artifacts were recovered from Units 31.02.01 and 31.02.02. In the former was a decorated tooth from a carnivore, probably an otariid, in Level 5 (40-50 cm), and a carved wedge fragment of cetacean bone was found in Level 9 (80-90 cm). A nearly complete fish hook made from camelid bone was recovered from Level 1 of Unit 31.02.02.

6.4.2.6 Paleobotany The flotation column was adjacent to Unit 31.02.01. The levels were 5 cm thick, and extended down 100 cm. A total of 2755 macroremains were recovered (Table 6.89). These were classified as: identified (corresponding to 24 taxa), unidentifiable, and unidentified, and within each group if they were carbonized (charred)or non carbonized (uncharred).

Table 6.89 Botanical macro remains at P31-1

Category	Status	n	%
Identified	charred	1516	55.03%
	uncharred	640	23.23%
Unidentifiable	charred	54	1.96%
	uncharred	164	5.95%
unidentified	charred	242	8.78%
	uncharred	139	5.05%
Total		2755	100.00%

Figure 6.26 shows a parallel situation with P29-1 in which macroremains decline drastically in number below about 25 cm, and in which non carbonized remains are common in this 25 cm, but then practically disappear. This situation is probably showing a drastic boundary between the end of the native occupation (AD 1687) and the modern deposits, and gives support to the idea that in this test pit the levels below the 25 cm deep remain mostly undisturbed. In fact, at that depth was recognized an intact feature.

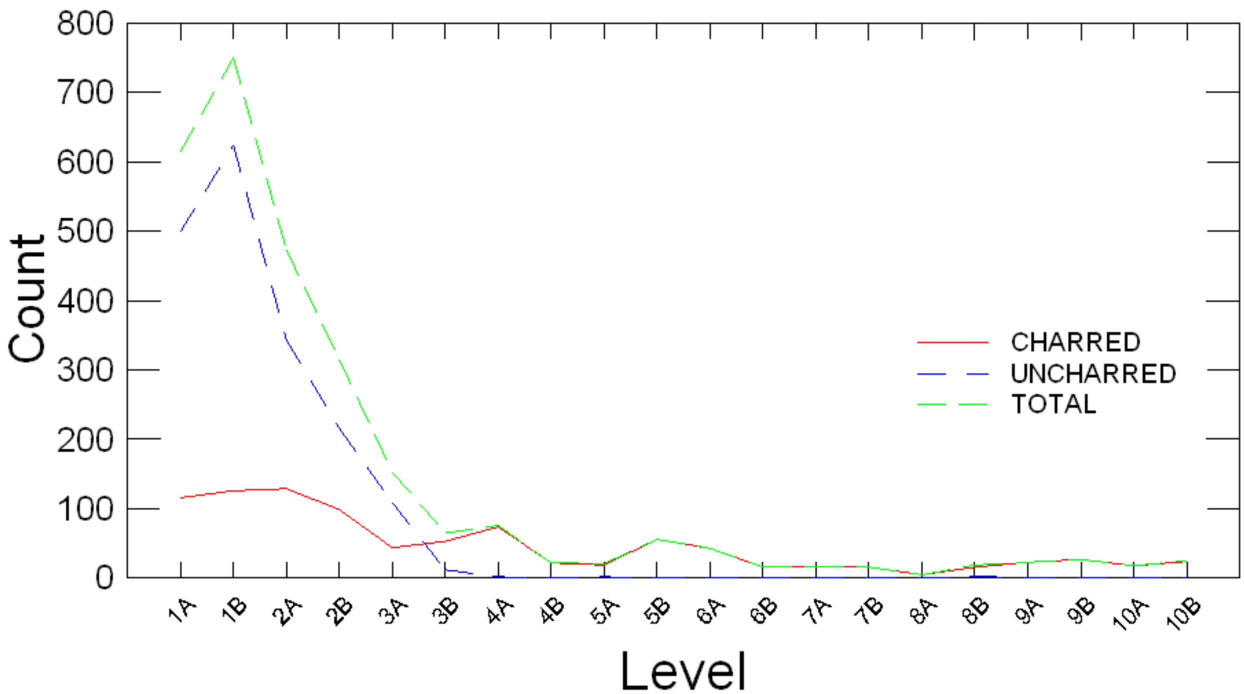

Figure 6.26 Charred and uncharred botanical macro remains per level at P31-1

As at P29-1, comparing Levels 3A to 3B reveals a dramatic shift in the representation of carbonized versus non carbonized remains (Figure 6.27). As with P29-1, I will therefore treat all non carbonized remains as modern, even when found below 25 cm (Table 6.90). The few identified non carbonized taxa (n=14) found below Level 3B represent taxa that could be either native or post-contact (Fabaceae and Poaceae) or directly post-contact (*Portulaca oleracea*).

On the order hand, the identified carbonized remains found in the five uppermost levels (n=323) correspond mostly to taxa that could be either native or post-contact (*Cyperus* sp. *Rubus* sp., Asteraceae, Fabaceae, Poaceae, Polygonaceae), and directly post-contact (*Silene gallica* and *Medicago* sp.); the only native species is *Fragaria chiloensis*.

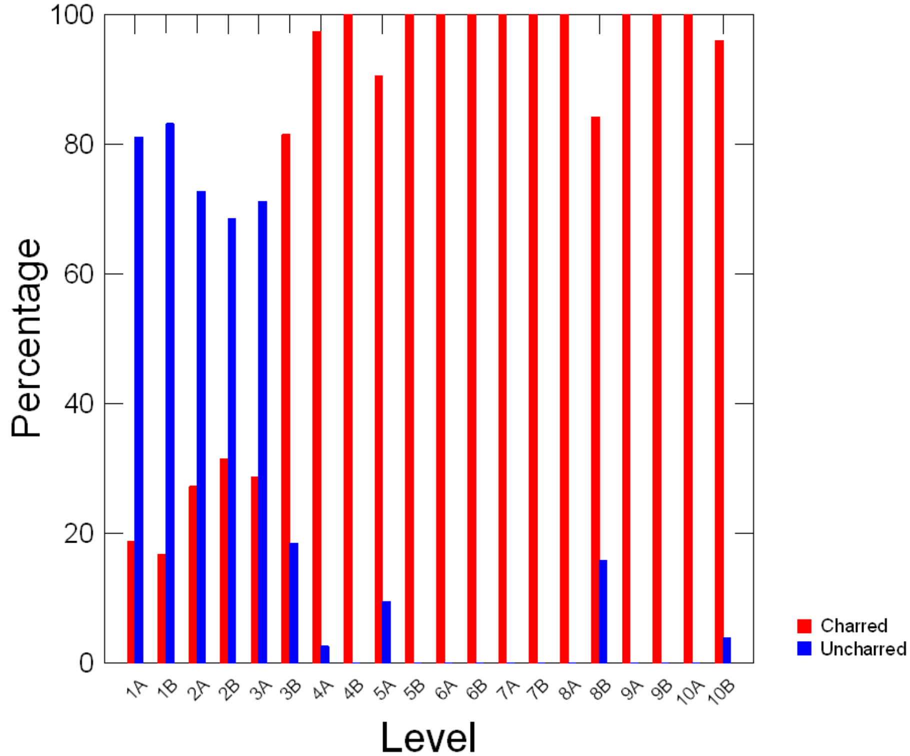

Figure 6.27 Charred versus uncharred botanical macro remains per level at P31-1

Table 6.90 Uncharred and charred taxa per level at P31-1

Taxa	**1A**	**1B**	**2A**	**2B**	**3A**	**3B**	**4A**	**4B**	**5A**	**5B**	**6A**	**6B**	**7A**	**7B**	**8A**	**8B**	**9A**	**9B**	**10A**	**10B**	**Total**	**% Total**
cm	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**	**80-85**	**85-90**	**90-95**	**95-100**		
Aristotelia chilensis (charred)										2											2	0.07
Asteraceae (uncharred)	41	34	24	6	28																133	
Asteraceae (charred)		49	8	17	7	1	8	2		2		2									96	
Bromus sp. (charred)							4	1													5	0.18
Chenopodium quinoa (charred)						19	21	3	7	17	21	8	8	9	3	9	5	8	3	7	148	5.37
Chenopodium sp. (uncharred)	24	21																			45	
Chenopodium sp. (charred)						2	17	12	3	11	5	1	1	1		2	2		4	2	63	
Cissus striata (charred)										4											4	0.15
Cryptocarya alba (charred)													1								1	0.04
Cyperus sp. (charred)			5							1											6	0.22
Drimys winteri (charred)										1							3	1			5	0.18
Fabaceae (uncharred)	22	16	45	5	8	3	1									3					103	
Fabaceae (charred)	7	8	9		15		1													1	41	
Fragaria chiloensis (uncharred)	12	11	4	3																	30	
Fragaria chiloensis (charred)			6	4			1			1	1					1			1	1	16	0.58
Gevuina avellana (charred)										2			1								3	0.11
Lapageria rosea (charred)							1														1	0.04
Medicago sp. (uncharred)	37	65	75	13																	190	
Medicago sp. (charred)	11		15	6																	32	
Muehlenbeckia hastulata (charred)									1	3	1	1	1			1		4			12	0.44

Table 6.90 (continued)

Taxa	**1A**	**1B**	**2A**	**2B**	**3A**	**3B**	**4A**	**4B**	**5A**	**5B**	**6A**	**6B**	**7A**	**7B**	**8A**	**8B**	**9A**	**9B**	**10A**	**10B**	**Total**	**% Total**
cm	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**	**80-85**	**85-90**	**90-95**	**95-100**		
Poaceae (uncharred)	44	64	14	18	19	3			1												163	
Poaceae (charred)	26	19	20	7	7																79	
Polygonaceae (uncharred)	102	56	44	39	15																256	
Polygonaceae (charred)	15	9	9	6																	39	
Portulaca oleracea	47	58	46	39			1		1											1	193	
Portulaca oleracea (charred)								1													1	
Rubus sp. (uncharred)	21	24	15	9																	69	
Rubus sp. (charred)				5													3	4	3	3	18	
Silene gallica (uncharred)	91	169	52	10																	322	
Silene gallica (charred)				33																	33	
Tritricum aestivum (uncharred)	7	5																			12	0.44
Typha angustifolia (charred)							1			1				1	1					1	5	0.18
Ugni molinae (charred)							1			4	7		3	2			6				23	0.83
Zea mays (charred)						2	1	1	1		1	1									7	0.25
identified (uncharred)	448	523	319	142	70	6	2		2							3				1	1516	55.03
identified (charred)	59	85	72	78	29	24	56	20	12	49	36	13	15	13	4	13	19	17	11	15	640	23.23
unidentifiable (uncharred)	14	9	5	6	20																54	1.96
unidentifiable (charred)	23	25	31	15	8	12	12	1	6	1	2	3	1	2	1	2	3	6	5	5	164	5.95
unidentified (uncharred)	37	92	20	68	19	6															242	8.78
unidentified (charred)	34	16	26	6	7	17	6	1	1	6	5		1	1		1	1	4	2	4	139	5.05
Grand Total	615	750	473	315	153	65	76	22	21	56	43	16	17	16	5	19	23	27	18	25	2755	100.0

Table 6.91 Charred taxa per level at P31-1

TAXA	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	8A	8B	9A	9B	10A	10B	Total	% Total
cm	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**	**80-85**	**85-90**	**90-95**	**95-100**		
Aristotelia chilensis										2											2	0.21
Asteraceae		49	8	17	7	1	8	2		2		2									96	10.18
Bromus sp.							4	1													5	0.53
Chenopodium quinoa						19	21	3	7	17	21	8	8	9	3	9	5	8	3	7	148	15.69
Chenopodium sp.						2	17	12	3	11	5	1	1	1		2	2		4	2	63	6.68
Cissus striata										4											4	0.42
Cryptocarya alba													1								1	0.11
Cyperus sp.			5							1											6	0.64
Drimys winteri										1							3	1			5	0.53
Fabaceae	7	8	9		15		1													1	41	4.35
Fragaria chiloensis			6	4			1			1	1					1			1	1	16	1.70
Gevuina avellana										2			1								3	0.32
Lapageria rosea							1														1	0.11
Medicago sp.	11		15	6																	32	3.39

Table 6.91 (continued)

TAXA	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B	7A	7B	8A	8B	9A	9B	10A	10B	Total	% Total
cm	**0-5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-65**	**65-70**	**70-75**	**75-80**	**80-85**	**85-90**	**90-95**	**95-100**		
Muehlenbeckia hastulata									1	3	1	1	1			1		4			12	1.27
Poaceae	26	19	20	7	7																79	8.38
Polygonaceae	15	9	9	6																	39	4.14
Portulaca oleracea								1													1	0.11
Rubus sp.				5													3	4	3	3	18	1.91
Silene gallica				33																	33	3.50
Typha angustifolia							1			1				1	1					1	5	0.53
Ugni molinae							1			4	7		3	2			6				23	2.44
Zea mays						2	1	1	1		1	1									7	0.74
identified	59	85	72	78	29	24	56	20	12	49	36	13	15	13	4	13	19	17	11	15	640	67.87
unidentifiable	23	25	31	15	8	12	12	1	6	1	2	3	1	2	1	2	3	6	5	5	164	17.39
unidentified	34	16	26	6	7	17	6	1	1	6	5		1	1		1	1	4	2	4	139	14.74
Grand Total	116	126	129	99	44	53	74	22	19	56	43	16	17	16	5	16	23	27	18	24	943	100.0

Among the carbonized macroremains (n=943), 640 (or 67.87%) could be identified, corresponding to 23 taxa, while 164 (17.39%) were unidentifiable, and 139 (14.74%) classified as unidentified (Table 6,91).

In this sample, *Chenopodium quinoa* and *Zea mays* have to be considered the only clear crop plants present. The remaining taxa are trees (*Aristotelia chilensis*, *Cryptocarya alba*, *Drimys winteri*, *Gevuina avellana*), shrubs (*Muehlenbeckia hastulata*, *Ugni molinae*), vines (*Cissus striata*, *Lapageria rosea*), and herbs (*Cyperus* sp., *Fragaria chiloenesis*, *Rubus* sp., *Typha angustifolia*) with edible parts. Again, some of these plants, or parts of them, would also have had economic uses.

The Asteraceae, Fabaceae, Poaceae, Poligonaceae, can correspond to either native or exotic species. In both cases, there are many species with no edible parts or known economic uses. Still, it is relevant to mention that the first two are found both above and below Level 3A, denoting Asteraceae and Fabaceae pre-European contact presence. In contrast the Poaceae and Poligonaceae are only found in Level 3A and above. This pattern is also seen in the known non-native *Silene gallica* and *Medicago* sp. In this context the presence of 1 specimen of *Portulaca oleracea* –also non-native- in Level 4B has to be considered very probably as intrusive.

In relation to this, and even though above it was indicated as either native or exotic, *Rubus* sp. probably correspond to the native *Rubus geoides* or *Rubus radicans* given its predominant presence in pre-contact levels. A similar argument can be made, but not so strongly, for *Cyperus* sp.

Finally, Bromus sp. might correspond to either *Bromus mango*, *Bromus berteroanus*, and/or *Bromus catharticus*, which were native prehispanic crops. On the other hand, *Chenopodium* sp. can correspond to a non-cultivated variety of quinoa, although closely related to it given their almost tandem presence during the entire column.

In order to evaluate this data in a more quantitative way, I again turn to the ubiquity index. I consider 2 scenarios, one in which all the levels (n=20) are included (Table 6.92), and another in which just the levels from 3B to 10B (n=15) are included (Table 6.93). The rationale for this is explained below.

Table 6.92 Charred botanical macro remains ubiquity (20 levels)

TAXA	# of levels 1A-10B(20)	Ubiquity
Chenopodium quinoa	15	75.00
Chenopodium sp.	13	65.00
Asteraceae	9	45.00
Fragaria chiloensis	8	40.00
Muehlenbeckia hastulata	7	35.00
Fabaceae	6	30.00
Ugni molinae	6	30.00
Zea mays	6	30.00
Poaceae	5	25.00
Rubus sp.	5	25.00
Typha angustifolia	5	25.00
Poligonaceae	4	20.00
Drimys winteri	3	15.00
Medicago sp.	3	15.00
Bromus sp.	2	10.00
Cyperus sp.	2	10.00
Gevuina avellana	2	10.00
Aristotelia chilensis	1	5.00
Cissus striata	1	5.00
Cryptocarya alba	1	5.00
Lapageria rosea	1	5.00
Portulaca oleracea	1	5.00
Silene gallica	1	5.00

Table 6.93 Charred botanical macro remains ubiquity (15 levels)

TAXA	# of levels 3B-10B(15)	Ubiquity
Chenopodium quinoa	15	100.00
Chenopodium sp.	13	86.67
Muehlenbeckia hastulata	7	46.67
Fragaria chiloensis	6	40.00
Ugni molinae	6	40.00
Zea mays	6	40.00
Typha angustifolia	5	25.00
Rubus sp.	4	33.33
Drimys winteri	3	20.00
Fabaceae	2	13.33
Bromus sp.	2	13.33
Gevuina avellana	2	13.33
Asteraceae	1	6.67
Cyperus sp.	1	6.67
Aristotelia chilensis	1	6.67
Cissus striata	1	6.67
Cryptocarya alba	1	6.67
Lapageria rosea	1	6.67
Portulaca oleracea	1	6.67
Poaceae	0	0.00
Poligonaceae	0	0.00
Medicago sp.	0	0.00
Silene gallica	0	0.00

If one considers the 20 levels, the most represented taxa are *Chenopodium quinoa*, and *Chenopodium* sp. If we assume (from the C14 dates) that Levels 4A and 4B are in the AD 1451-1626 range, these would correspond to the period right before and following the European arrival. The level above this (Level 3B) also contains native crops as quinoa and maize, but a dramatic shift occurs in the Level 3A, with the disappearance of these two crops. Perhaps this development marks the abandonment of the island?

If we consider the Levels 3B through 10B (15 levels), *Chenopodium quinoa* is present in each of them, followed closely by *Chenopodium* sp. (in 13 levels), showing the importance that quinoa cultivation had for the native population from the 13th century to the late 17th century. Maize is less represented, perhaps denoting a different economic importance or role. *Muehlenbeckia hastulata*, *Cryptocarya alba*, and *Lapageria rosea*, are known on the island only from archaeological deposits. They are absent today from the island, and have not been yet identified in the pollen columns. The high ubiquity of *Muehlenbeckia hastulata* could indicate that this species was present on the island in the past, while the other two species may have been imported.

6.4.2.7 P31-1 Excavation Summary Test units were placed in residential refuse areas. No structure remains were encountered, but features, including a hearth-like feature in Unit 31.02.01 were found. Probably not coincidentally, that unit was also one of the highest artifact density units excavated at this site. The differences in artifact densities in the units, and in the relative depth of occupations, support the conclusions derived from surface collections that the occupation can be divided into at least two zones of high density or concentrated settlement – roughly to the north and south of the Quebrada del Camino Nuevo stream-, and that the site expanded through time, from AD 1200 through AD 1685.

Intra-site variability in artifact assemblages (ceramics, lithics) was quite limited overall; we found no marked wealth/status related differences, or even object identifiable as luxury or high value goods. Comparison of the ceramic assemblages, however, reveals some significant differences among units, including the high proportions of High Investment pottery and animal bone in Unit 31.02.01, and the low proportions of High value pottery in Unit 31.02.06 and Unit 31.02.07. Unit 31.02.07 also exhibited the highest proportions of coarse grain stone tool material, and the lowest proportion of animal bone. Therefore, we may be able to identify the Unit 31.02.01 zone as a “relatively high status” loci, and the Unit 31.02.06 and Unit 31.02.07 zone as a “low status” one.

6.4.3 P5-1 Excavation

The earthquake and tsunami that hit south-central Chile on February 27, 2010, forced me to suspend all fieldwork, and for that reason I was unable to perform test pits in this site.

6.4.4 Mound Complex Excavation

The two mounds of the research zone are located on a flat area, bracketed by an arm of the central range and an ancient landslide, facing the ocean and, across it, the mainland. On mainland sites, mounds are set on low, expansive platforms (Dillehay 2007), and this is true for the Isla Mocha mounds as well, although the size of this platform has not been completely determined. Visual inspection of the surface suggest that the platform may have been as large as 4.5 ha.

Apparently the terraplein took advantage of one of a paleocoastline to the northeast of the mounds The presence of the platform seems to be supported by a depression that lies between it and the landslide. Finally a possible causeway goes from the mounds themselves to the landslide.

Figure 6.28 depicts the above features. The platform is in red, the causeway en blue, and the northern limit of the landslide in black.

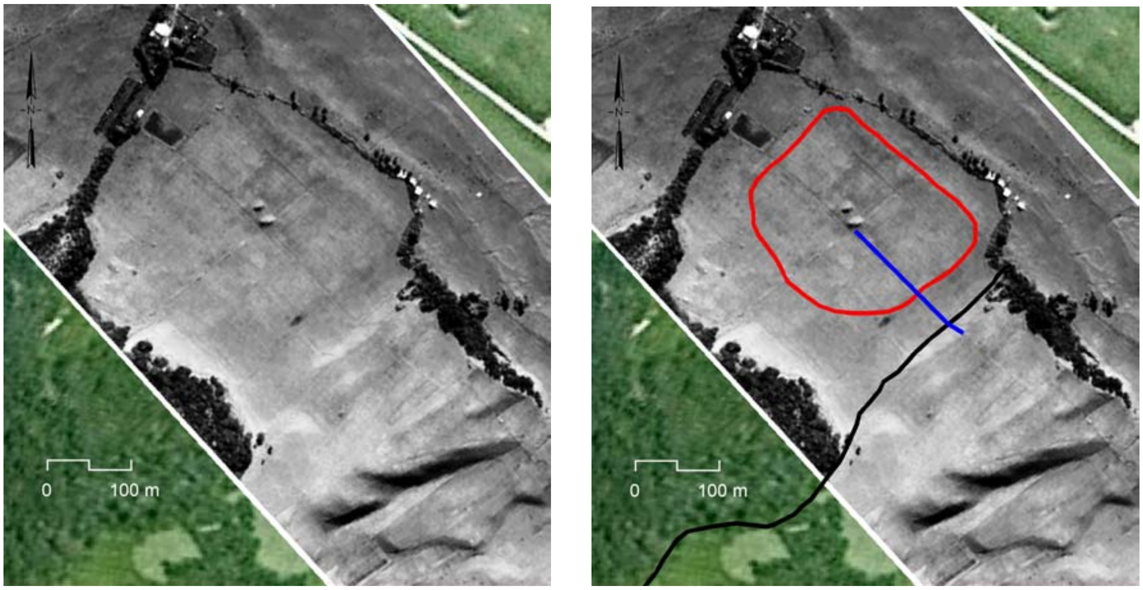

Figure 6.28 Mounds, platform, and causeway (Gobierno Regional del Biobio 2010 photograph)

Figure 6.29 shows more clearly the possible causeway, the apparent south-eastern boundary of the platform, and the depression between the platform and the landslide.

Figure 6.29 Causeway, and depression between the platform and the landslide

An excavation trench was placed into the northern mound, with the goal of exposing its stratigraphy and construction processes, and obtaining archaeological material including samples for dating. The trench measured 7.4 m x 0.6 m, and extended from the mound top to the south and into the space between the mounds. Thus the trench generated two profiles: one of the mound itself, and the other ("mound base profile") of the space between the mounds. In Figure 6.30 the small rectangle over the North Mound is the excavated trench; the dashed lines are elevation curves at 25 m intervals, in order to denote the "amphitheater" disposition of area.

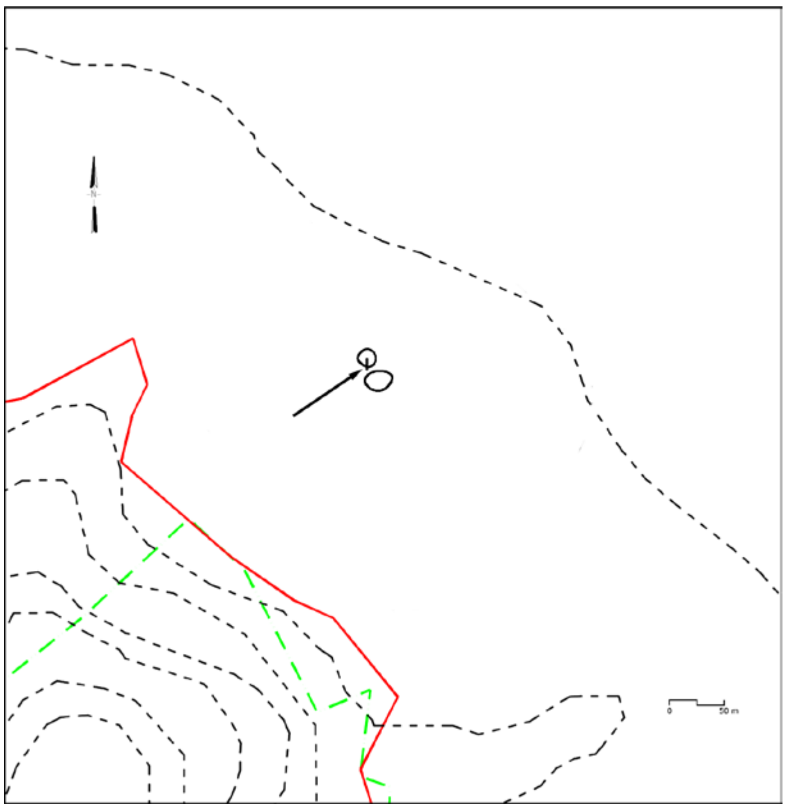

Figure 6.30 Mounds setting and excavation trench

In the mound itself, the excavation exposed 5.24 m of stratigraphy: 2.80 m from the current top of the mound to the ground surface, together with another 2.44 m of strata below the current ground level around the mound. The mound base profile reached a depth of 0.97 m. (Figure 6.31).

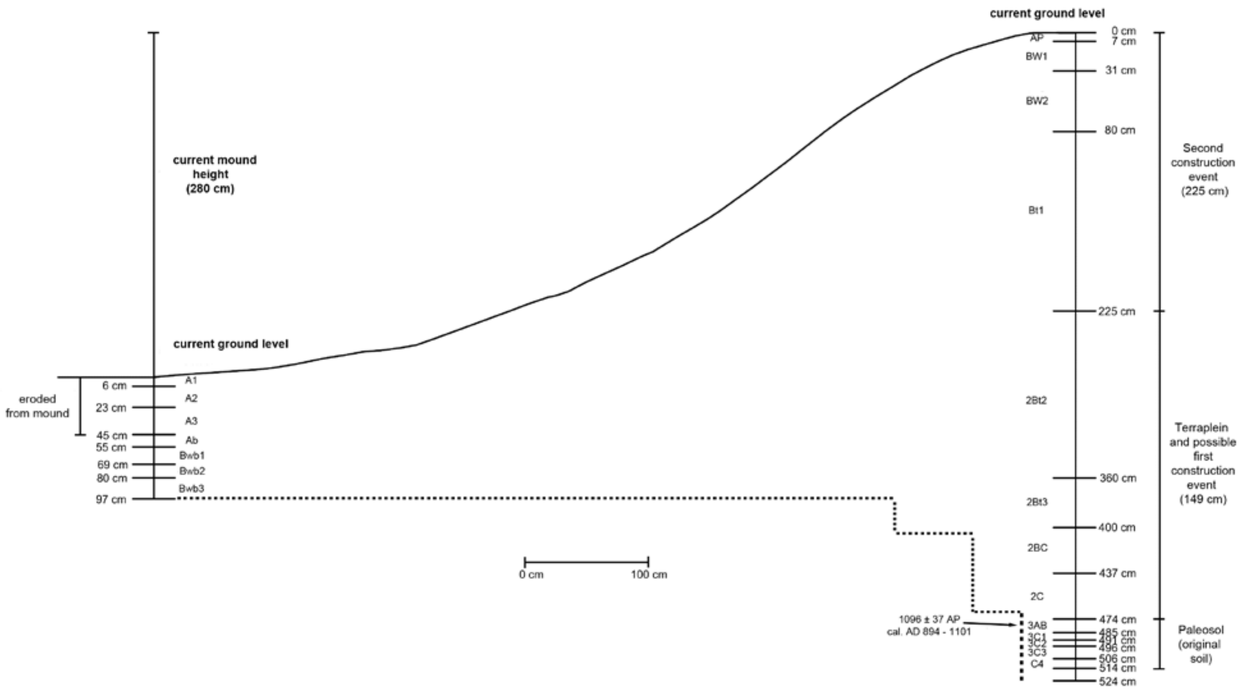

Figure 6.31 North Mound excavation

Excavation quickly confirmed the mound's cultural origin, and a series of strata were distinguished. The natural original paleosol, over which the mound was constructed, was found to a depth of 4.74 m from the mound top. The strata in the mound profile also allowed the identification of two possible major construction episodes in the mound profile. The first of these would correspond to the construction of the large leveling platform on top of the paleosol, and represented deposition of some 1.35 m of fill. A second construction episode added another 2.25 m to the top of the mound. Unfortunately, the entire matrix of the mound is a rather homogenous soil fill, devoid of any archaeological remains. Only in the first 11 cm (474-485 cm depth) of the buried paleosol was archaeological material found. The Mound Base profile also revealed indications of erosion from the mound, in the lower 0.45 m around the mounds, denoting that the mound had had a larger size in the past.

6.4.4.1 Chronology One AMS 14C dates was run for the mound. This sample was taken from the 3Ab horizon, in the palesol, beneath the mound (Table 6.94 and Figure 6.32). A second date, taken from the Ab horizon, in the mound base profile, and buried below mound eroded soil is now being processed. The 3Ab horizon date is:

Table 6.94 North Mound radiocarbon date

Sample	Depth	14C Age BP	Cal. Age AD ± 2σ	Δ13C	Material
AA 89415	474-485 cm	1096 ± 37	894 - 1101	-25.4	charcoal

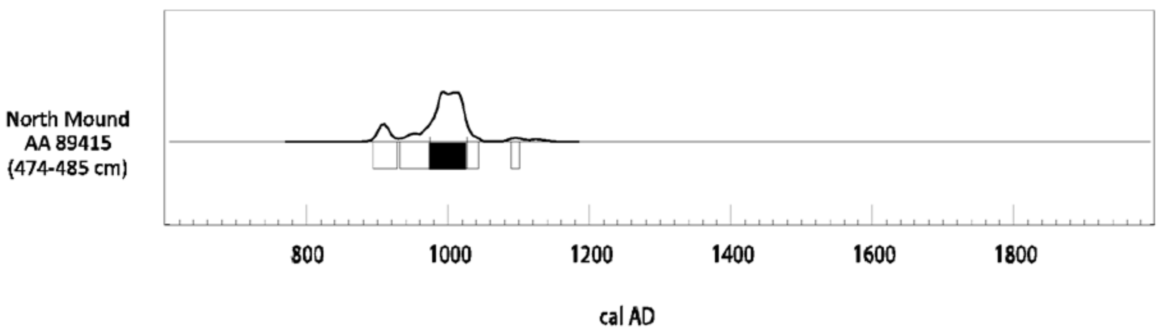

Figure 6.32 Plot for North Mound radiocarbon dates

This date puts the mound construction into the early El Vergel complex time frame, and, in fact, construction of the mound may have been contemporaneous with the early occupation of P29-1.

6.4.4.2 Ceramics Nine sherds were recovered from the paleosol layer. Using the “Finishing Investment” index, the assignation of these sherds is:

- 4 Low Investment sherds (Smoothed and Fine Smoothed without any decoration),
- 2 Medium Investment sherds (Fine Smoothed with Slip in one side), and
- 3 High Investment sherds (Fine Smoothed with Slip in both sides).

Twenty-eight different tempers were identified in these 9 sherds (Table 6.95).

Table 6.95 Ceramic tempers at North Mound

Temper	# tempers	%
Peebles	8	28.57
Shells	6	21.43
Quartz	8	28.57
Basalt	6	21.43
Total	28	100.00

6.4.4.3 Lithics Just 2 lithics were found in the paleosol layer. One corresponds to schist core debitage, and the other to a sandstone net sinker. This last one is a very small (19 mm length, 21.7 mm width, 14.5 mm thickness), with a weight of 6.3 gm.

6.4.4.4 Faunal Remains Seven bones were recovered from paleosol layer, but only two could be identified, as Spheniscidae sp. (penguins), and very probably as *Spheniscus humboldti* (Humboldt Penguin) (Table 6.96).

Table 6.96 Faunal remains NISP at North Mound

Class	Order	Genera	Specie	NISP	%
Aves	Ciconiiformes	Spheniscidae	*Spheniscus humboldti*?	2	28.57
Indeterminate				5	71.43
Total				7	100.00

6.4.4.5 Paleobotany A 30 x 30 cm column was excavated in the paleosol strata from 474 to 494 cm depth. 4 samples were taken following the methodology already outlined (Table 6.97).

Table 6.97 Botanical macro remains at North mound

Taxa	1 (474-479 cm)	2 (479-484 cm)	3 (484-489 cm)	4 (489-494 cm)	Total
Chenopodium sp. (charred)	2				2
Poaceae (uncharred)			1		1
Poaceae (charred)				3	3
Unidentifiable (charred)			2	4	6
Total	2		3	7	12

It is noticeable the presence of charred remains beneath the mound, which then should be previous to the mound construction. Unfortunately level of burning of the bones prevented a more accurate identification.

7.0 DISCUSSION

7.1 CERAMICS

Ceramics were by far the most ubiquitous remain found, therefore they became in a sense the backbone for my research, and for that reason most discussion will revolve around this line of evidence.

In comparing the ceramics from the Survey, Intensive Surface Collections and Test Pits, it appears that weathering severely affected the samples gathered by the two first techniques. A study based solely on the surface materials would face important constraints. Therefore, excavation became important as a way to gather assemblages of less eroded sherds.

The use of the "finishing Investment" index to compare the results of these three strategies across the 3 sites (P29-1, P31-1, and P5-1) provides interesting results. However, a drawback is the absence of Intensive Surface Collections results for P31-1 and of Test Pits for P5-1. Only in the case of P29-1 do I have results from all three strategies.

For P29-1 (Table 7.1), the three investment categories (Low, Medium, and High) present differences at less than 80% confidence level, if one compares the Survey and the Intensive Surface Collection. Therefore one could argue that the intensive surface collections replicated at a certain level the results of the general survey collections. However, if one compares the Survey and the Test Pits, for the Low Investment sherds, the difference is at more than 80% confidence level, for the Medium Investment at less than 80%confidence level, and for the High Investment at more than 99% confidence level. Here, then is a tendency to disagreement between the results obtained from the two techniques

Finally, the Intensive Surface Collections and the Test Pits provide differences of more than 95% confidence level (for the Low Investment) and more than 99% confidence level (for the Medium and High Investment ceramics). Here there is a dramatic dissimilarity between the results of each collection technique. This is more relevant if one considers that the Intensive Surface Collection Unit 02.29.01 at P29-1 is located between the test pits 29.01.02 and 29.01.01, which yielded 65.5% of this analysis' sherds.

These results are in line with the situation originally envisioned concerning an increase of the Low Investment sherds and a decrease of the High Investment sherds in the upper 30 cm at the test pit 29.01.02, and at a lesser degree at 29.01.03. It is important to remember that modern plowing disturbs the ground up to 25 to 30 cm deep, therefore the surface material corresponds in great part to those upper 30 cm deposit material.

Table 7.1 Differences on ceramic investment types proportions between collection technique at P29-1

Investment type	Technique	Technique	Proportion Differences
Low	Survey	Intensive Surface Collection	Less than 80% CL
	Survey	Test Pit	**More than 80% CL**
	Intensive Surface Collection	Test Pit	**More than 95% CL**
Medium	Survey	Intensive Surface Collection	Less than 80% CL
	Survey	Test Pit	Less than 80% CL
	Intensive Surface Collection	Test Pit	**More than 99% CL**
High	Survey	Intensive Surface Collection	Less than 80% CL
	Survey	Test Pit	**More than 99% CL**
	Intensive Surface Collection	Test Pit	**More than 99% CL**

In the case of P31-1 (Table 7.2), I only have Survey and Test Pit information. In a sense both techniques cover the same area –not like the Intensive Surface Collections that corresponds to a specific sector within the site-, and therefore one should expect alike values. However, in this case, both the Low and High Investment sherds present proportion differences at more than 99% confidence level. Meanwhile, for the Medium Investment sherds, the difference is at less than 80% confidence level. This situation could be reflecting, again, the increase of the Low Investment sherds and a decrease of the High Investment sherds in the upper 30 cm, already indicated for test pit 31.02.01, and probably also represented at test pits 31.02.06, 31.02.07, and 31.03.02

Table 7.2 Differences on ceramic investment types proportions between collection technique at P31-1

Investment type	Technique	Technique	Proportion Difference
Low	Survey	Test Pit	**More than 99% CL**
Medium	Survey	Test Pit	Less than 80% CL
High	Survey	Test Pit	**More than 99% CL**

Finally, for P5-1 (Table 7.3), I do not have stratigraphic information. In this case the Survey and Intensive Surface Collections (just one unit) show a difference at more than 95% confidence level for the Low and Medium Investment sherds. Meanwhile, for the High Investment sherds the difference is at less than 80% confidence level. This situation might be indicating that this Intensive Collection unit differs from the site as a whole.

Table 7.3 Differences on ceramic investment types proportions between collection technique at P5-1

Investment type	Technique	Technique	Proportion Difference
Low	Survey	Intensive Surface Collection	**More than 95% CL**
Medium	Survey	Intensive Surface Collection	**More than 95% CL**
High	Survey	Intensive Surface Collection	Less than 80% CL

These conclusions are confirmed if one compares each one of these strategies to the average proportion obtained for the whole sample under study (Table 7.4 and Figure 7.1). Doing this, we can see that, for the Low Investment sherds, only the Test Pit assemblages provided proportions below the average, and only P31-1 at more than 99% confidence level.

Table 7.4 Differences on ceramic investment types proportions by collection technique per site

Technique	Site	Low Investment		Medium Investment		High Investment	
		Above	Below	Above	Below	Above	Below
Survey	P29-1	> 80% and < 95% CL			< 80% CL		> 99% CL
	P31-1	> 99% CL			> 80% and < 95% CL		> 99% CL
	P5-1	> 99% CL			< 80% CL		> 99% CL
Intensive Surface Collection	P29-1	> 80% and < 95% CL		> 95% and < 99% CL			> 99% CL
	P5-1	> 80% and < 95% CL		> 95% and < 99% CL			> 99% CL
Test Pit	P29-1		< 80% CL		< 80% CL	> 95% and < 99% CL	
	P31-1		> 99% CL		> 80% and < 95% CL	> 99% CL	

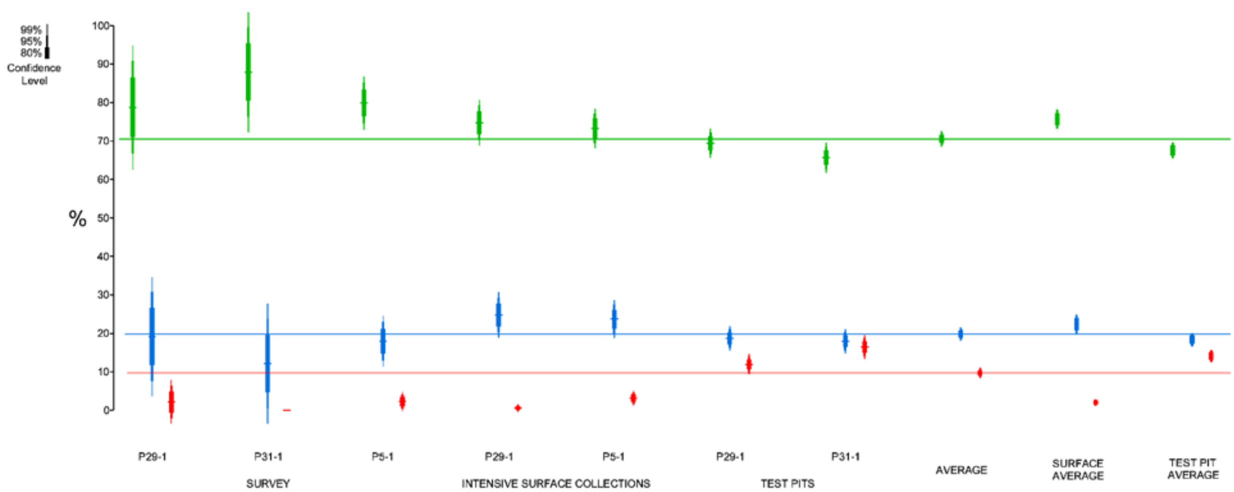

Figure 7.1 Proportions of ceramic investment types by collection technique per site

The results so far indicate indeed for the test pits a higher proportion of High Investment sherds and a lower proportion of Low Investment sherds. One observation to be gained from this is that the sub-surface materials are not reflecting so clearly the surface materials. A second observation is that, from the test pit material, P29-1 and P31-1 seem to be not so similar sites.

In order to evaluate these observations, I decided to focus on getting a broader view by comparing the test pits (P29-1, 3 test pits; P31-1, 10 test pits) from each site.

The first approach I took was using each pit's proportions of Low, Medium, and High Investment sherds. Figure 7.2 shows these results. The most noticeable aspect is how much the test pit 31.02.01 at P31-1 differs from all other test pits. It has the lowest proportion of Low Investment sherds and the highest proportion of High Investment sherds. In second place in this pattern is test pit 29.01.02 at P29-1.

These aspects are parallel with the results obtained from the analysis of each site. They indicate that these two test pits differ significantly from their counterparts. But now we can see that the first one (31.02.01) is much different from all others, while the second one (29.01.02) is somewhat more similar to the remaining P29-1 and P31-1 test pits.

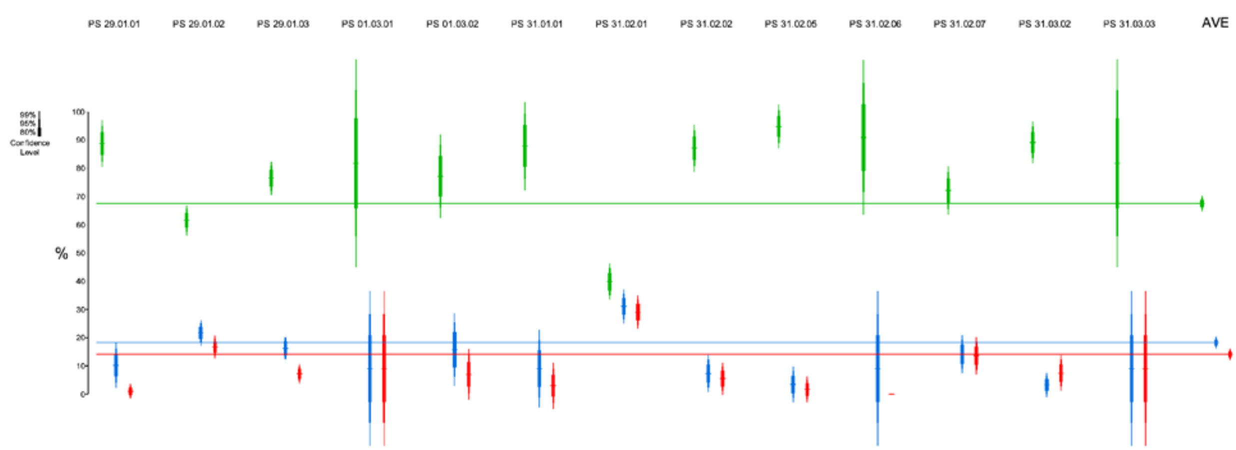

Figure 7.2 Proportions of ceramic investment types by test pit

To further understand the test pit variability, I next turn to Multidimensional Scaling (MDS), with the goal of getting a more visually comprehensible pattern of the test pits and their ceramic type distributions. In the MDS analysis, I used as variables the proportion of High, Medium, and Low Investment sherds at each test pit (Table 7.5). In order to create a similarity matrix, I used the Gower's coefficient and the SIMS software with a treatment without square root.

Table 7.5 Summary of ceramic investment types proportions per test pit

Case #	Test Pit	Depth (in cm)	# sherds	Low	Medium	High
1	29.01.01	80	98	0.89	0.10	0.01
2	"29.01.02 (y Ext SE)"	120	557	0.62	0.22	0.17
3	29.01.03	60	345	0.77	0.16	0.07
4	01.03.01	30	11	0.82	0.09	0.09
5	01.03.02	40	57	0.77	0.16	0.07
6	31.01.01	30	33	0.88	0.09	0.03
7	31.02.01	100	389	0.40	0.31	0.29
8	31.02.02	20	109	0.87	0.07	0.06
9	31.02.05	30	58	0.95	0.03	0.02
10	31.02.06	20	11	0.91	0.09	0.00
11	31.02.07	100	177	0.72	0.14	0.14
12	31.03.02	40	120	0.89	0.03	0.08
13	31.03.03	40	11	0.82	0.09	0.09

The graph of declining final stress values (Figure 7.3) indicates that a 1 dimension plot is already an interpretable one (with a value of 0.046), while the 2 dimension solution presents a value of 0.014. I opted for the 2 dimension plot since it is visually easier to read.

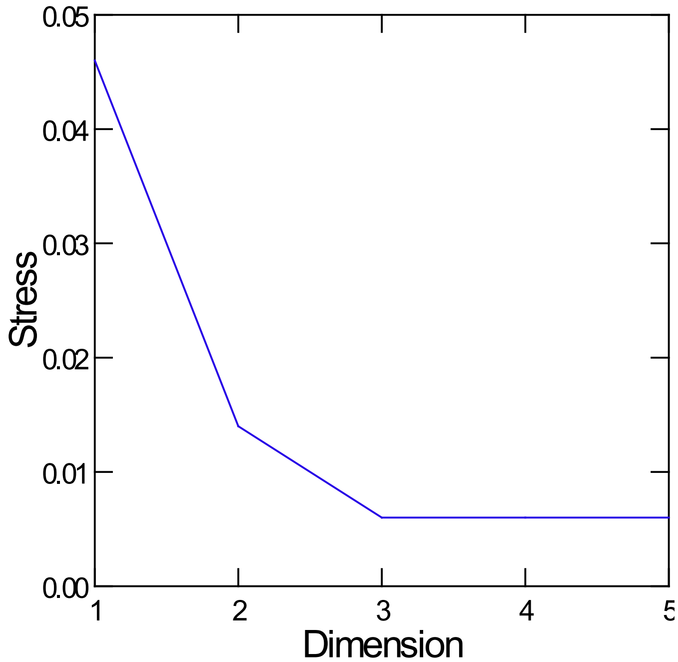

Figure 7.3 Graph of declining final stress values

The plots for each one of the variables (that is, ceramic investment types) are in green for the Low Investment sherds, in blue for the Medium Investment sherds, and in red for the High Investment sherds. The size of each circle refers to its value proportion (Figure 7.4).

These plots present a single axis, and help to locate each test pit along this axis. That axis goes from the case (case 7) with the highest proportion of High Investment sherds and the lowest proportion of Low Investment sherds, to the inverse (case 9) at the other extreme. In other words, one could propose that axis as a kind of status axis. In that case, those test pits with a higher status are in the left part of the plot, and those with a lower status in the right part of the plot. In this way, one can recognize 4 groups within the plot (already discernable in the previous three plots) (Figure 7.5 and Table 7.6).

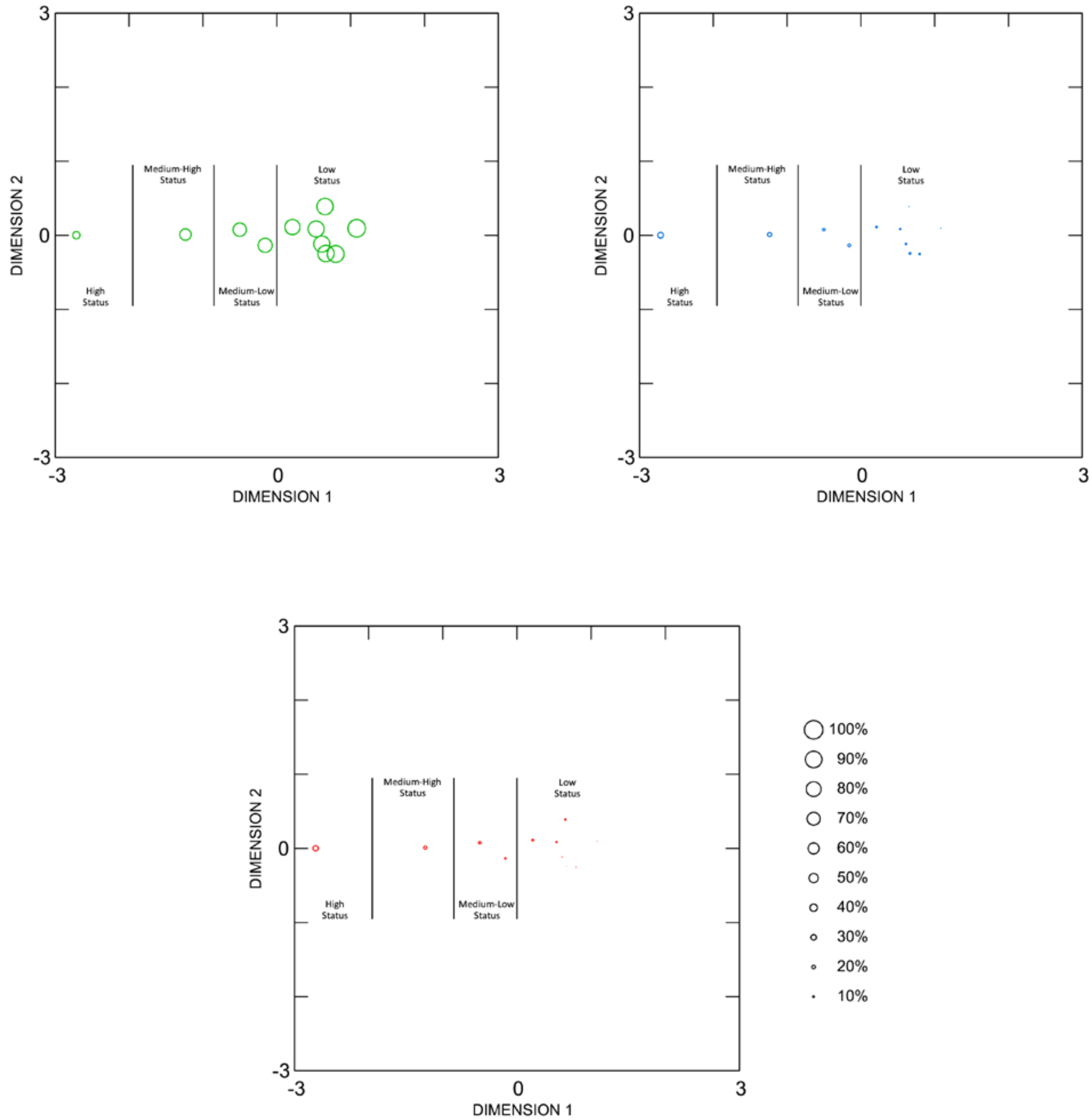

Figure 7.4 Plots for the ceramic investment types

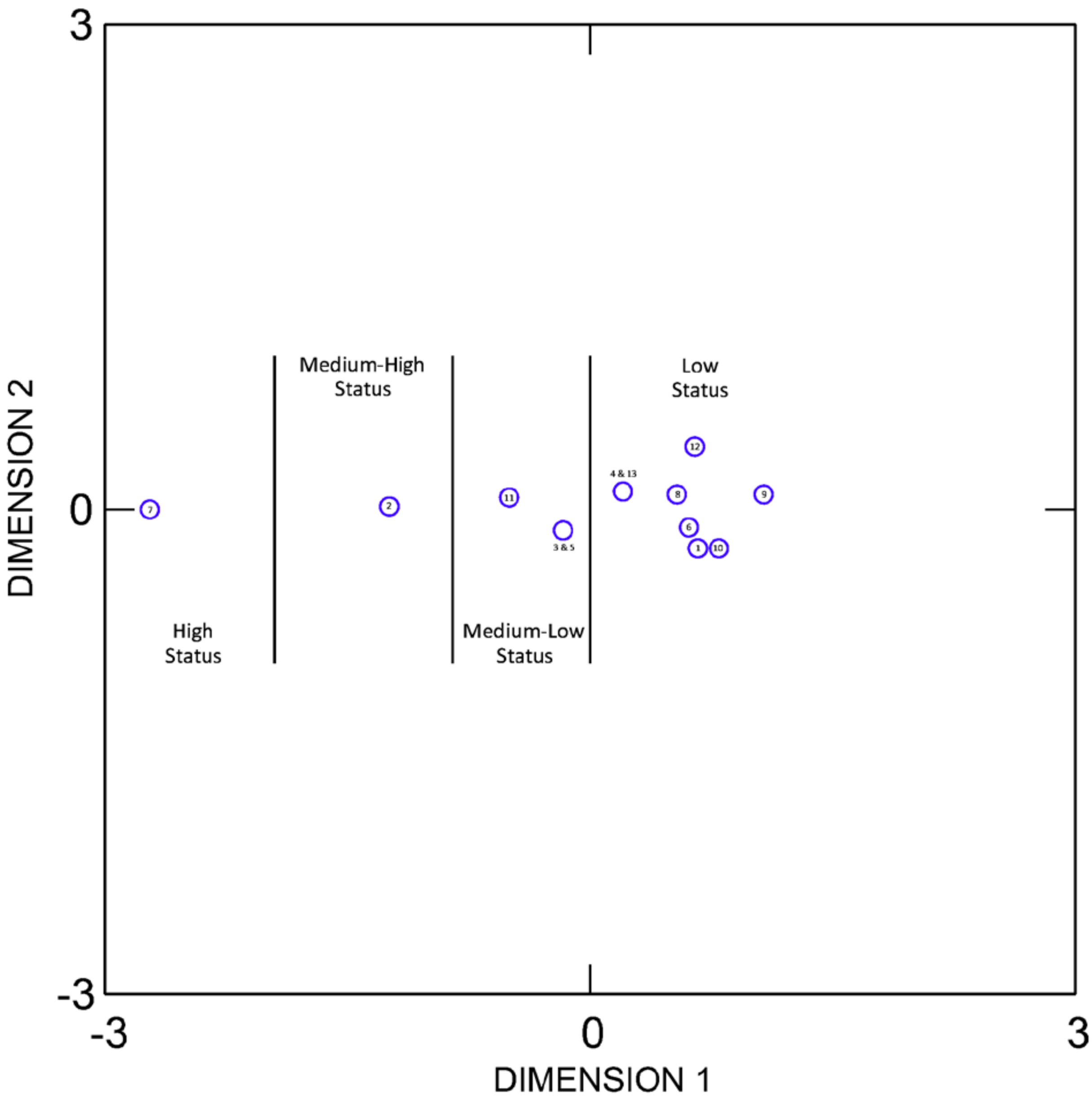

Figure 7.5 Status groups plot

Table 7.6 Average proportions of ceramic investment types per status group

Status Group	Case #	Average Low	Average Medium	Average High
High	7	39.85	31.11	29.05
Medium-High	2	61.58	21.72	16.70
Medium-Low	3, 5 and 11	75.13	15.54	9.33
Low	1, 4, 6, 8, 9, 10, 12, and 13	88.91	6.65	4.43

These results are very interesting because they confirm the uniqueness in the sample of test pit 31.02.01 (case 7) in contrast to the other test pits. At the same time, the test pit 29.01.02 is also different, but to a lesser degree. In other words, I have two test pits (one on each site) with a high proportion of High Investment sherds, but the one at P31-1 clearly is higher in this regard.

To complicate matters, it should be observed that there are test pits with a shallow deposit (30 cm or less) (cases 4, 6, 8, 9, and 10) which make up a good part of the Low status group. This situation is very interesting since those 30 cm correspond to the levels disturbed by the modern plowing and also because of the trend observed at 29.01.02 and 31.02.01 –as was presented in each site section in Chapter 6- where I found a dramatic increase in the proportion of Low Investment sherds along a decrease in the proportion of High Investment sherds. Therefore, the figure above could be capturing some temporal variability.

To deal with this problem, and as a way to test the homogeneity through time of the test pit ceramic assemblages, I decided to run a Multidimensional Scaling using each level as a case analysis (Table 7.7). I used the same parameters as in the previous analysis: the Gower's coefficient and the SIMS software with a treatment without square root. In some cases I opted to combine different levels in order to get samples with no less than 10 sherds per stratigraphic unit.

Table 7.7 Summary of ceramic investment types proportions per stratigraphic unit

Case #	Test Pit	Depth(in cm)	# sherds	Low	Medium	High
1	29.01.01	0-10	14	1.00	0.00	0.00
2	29.01.01	20-30	12	1.00	0.00	0.00
3	29.01.01	30-40	17	0.88	0.12	0.00
4	29.01.01	40-50	21	1.00	0.00	0.00
5	29.01.01	50-60	13	0.85	0.15	0.00
6	29.01.01	60-70	10	0.70	0.20	0.10
7	29.01.01	70-80	11	0.64	0.36	0.00
8	29.01.02	0-10	117	0.91	0.05	0.04
9	29.01.02	10-20	61	0.90	0.10	0.00
10	29.01.02	20-30	52	0.62	0.17	0.21
11	29.01.02	30-40	36	0.42	0.39	0.19
12	29.01.02	40-50	22	0.27	0.45	0.27
13	29.01.02	50-60	36	0.36	0.42	0.22
14	29.01.02	60-70	32	0.47	0.38	0.16
15	29.01.02 y Ext E	70-80	106	0.45	0.26	0.28
16	29.01.02 y Ext E	80-90	58	0.57	0.24	0.19
17	29.01.02 Ext E	90-120	37	0.54	0.19	0.27
18	29.01.03	0-10	69	0.84	0.10	0.06
19	29.01.03	10-20	107	0.74	0.21	0.06
20	29.01.03	20-30	95	0.77	0.17	0.06
21	29.01.03	30-40	64	0.72	0.16	0.13
22	29.01.03	40-60	10	0.80	0.10	0.10
23	01.03.01	0-30	11	0.82	0.09	0.09
24	01.03.02	0-20	45	0.82	0.16	0.02
25	01.03.02	20-40	12	0.58	0.17	0.25
26	31.01.01	0-30	33	0.88	0.09	0.03
27	31.02.01	0-10	42	0.57	0.33	0.10

Table 7.7 (continued)

Case #	Test Pit	Depth(in cm)	# sherds	Low	Medium	High
28	31.02.01	10-20	75	0.63	0.27	0.11
29	31.02.01	20-30	54	0.80	0.20	0.00
30	31.02.01	30-40	21	0.24	0.38	0.38
31	31.02.01	40-50	42	0.17	0.43	0.40
32	31.02.01	50-60	27	0.15	0.15	0.70
33	31.02.01	60-70	15	0.13	0.47	0.40
34	31.02.01	70-80	36	0.17	0.47	0.36
35	31.02.01	80-90	23	0.22	0.26	0.52
36	31.02.01	90-100	54	0.22	0.30	0.48
37	31.02.02	0-10	57	0.91	0.05	0.04
38	31.02.02	10-20	52	0.83	0.10	0.08
39	31.02.05	0-30	58	0.95	0.03	0.02
40	31.02.06	0-20	11	0.91	0.09	0.00
41	31.02.07	0-10	12	1.00	0.00	0.00
42	31.02.07	10-20	21	0.90	0.10	0.00
43	31.02.07	20-30	15	0.67	0.20	0.13
44	31.02.07	30-40	17	0.71	0.18	0.12
45	31.02.07	40-50	39	0.72	0.10	0.18
46	31.02.07	50-60	19	0.79	0.05	0.16
47	31.02.07	60-70	11	0.73	0.09	0.18
48	31.02.07	70-80	19	0.79	0.05	0.16
49	31.02.07	80-100	24	0.33	0.42	0.25
50	31.03.02	0-10	34	1.00	0.00	0.00
51	31.03.02	10-20	59	0.93	0.02	0.05
52	31.03.02	20-40	27	0.67	0.11	0.22
53	.31.03.03	0-40	11	0.82	0.09	0.09

Again, the graph of declining final stress values (Figure 7.6) indicates that a 1 dimension plot is already an interpretable one (with a value of 0.112). However I opted for the 2 dimension solution (with a stress value of 0.032) because it is easy to read and interpret.

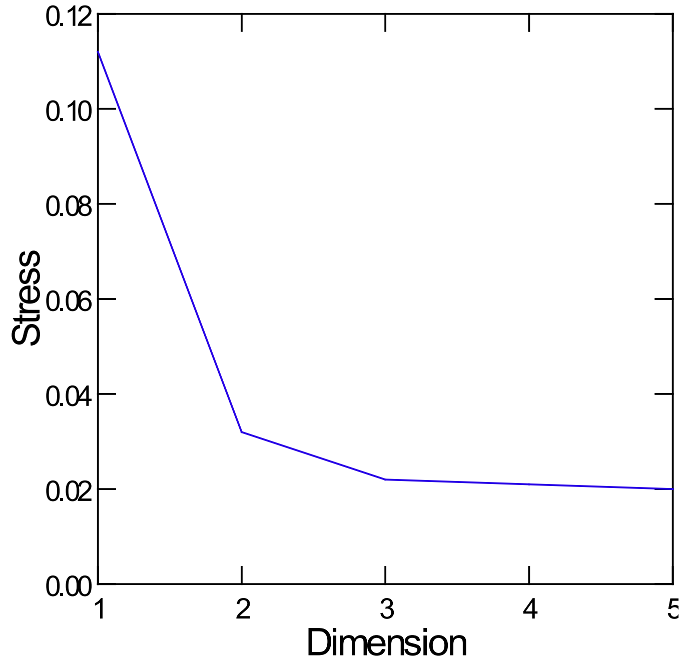

Figure 7.6 Graph of declining final stress values

The plots for each one of the variables (that is, ceramic investment types) are in green for the Low Investment sherds, in blue for the Medium Investment sherds, and in red for the High Investment sherds. The size of each circle refers to its value proportion (Figure 7.7).

In this case, one can identify the same status axis –although a curved one- as already discussed for the previous plot. This axis goes from case 32 (as its higher status extreme) to the cases 1, 2, 4, 41, and 50 (as its lower status extreme).Within this axis I recognized 3 groups. (Figure 7.8 and Table 7.8).

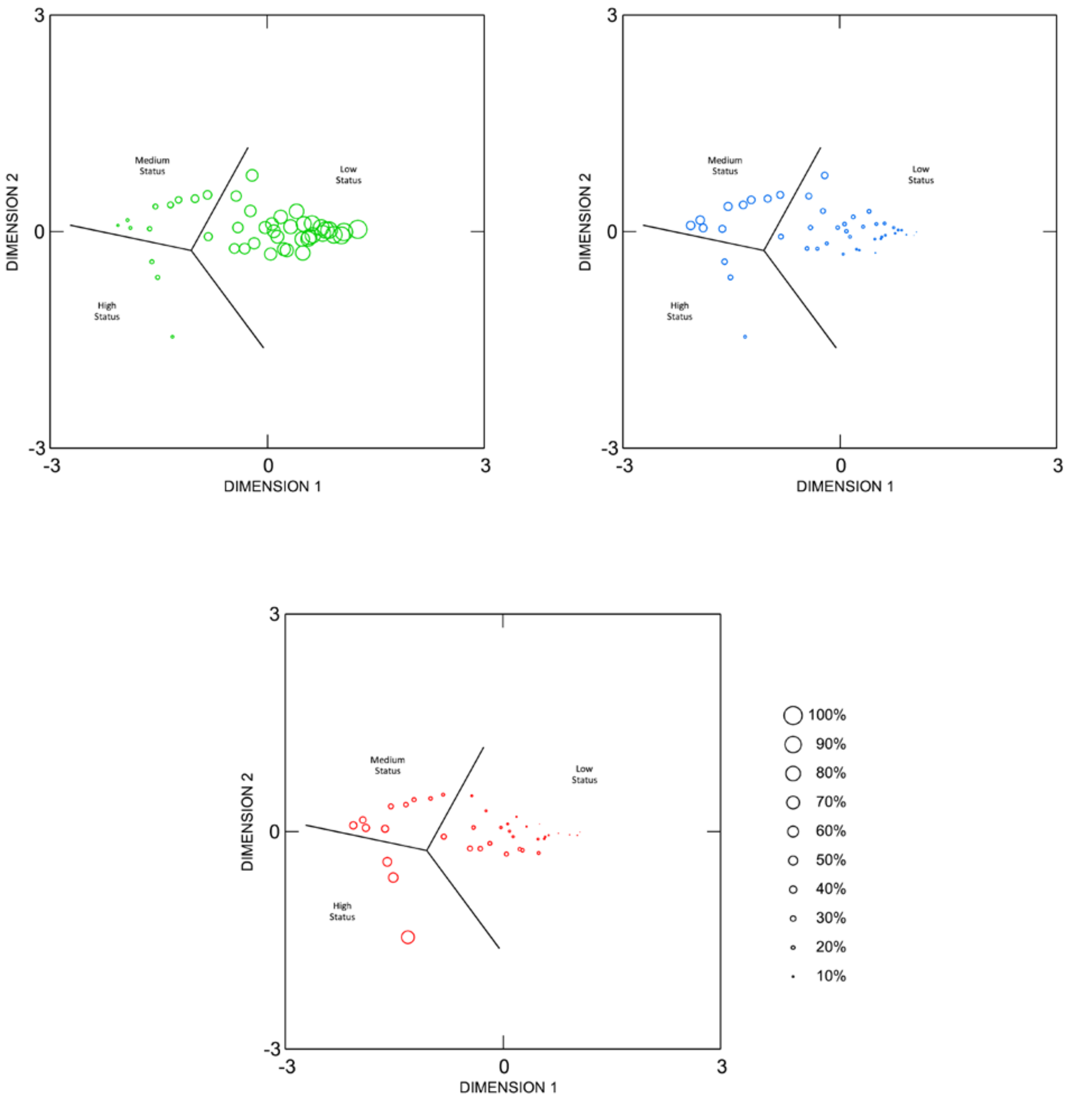

Figure 7.7 Plots for the ceramic investment types

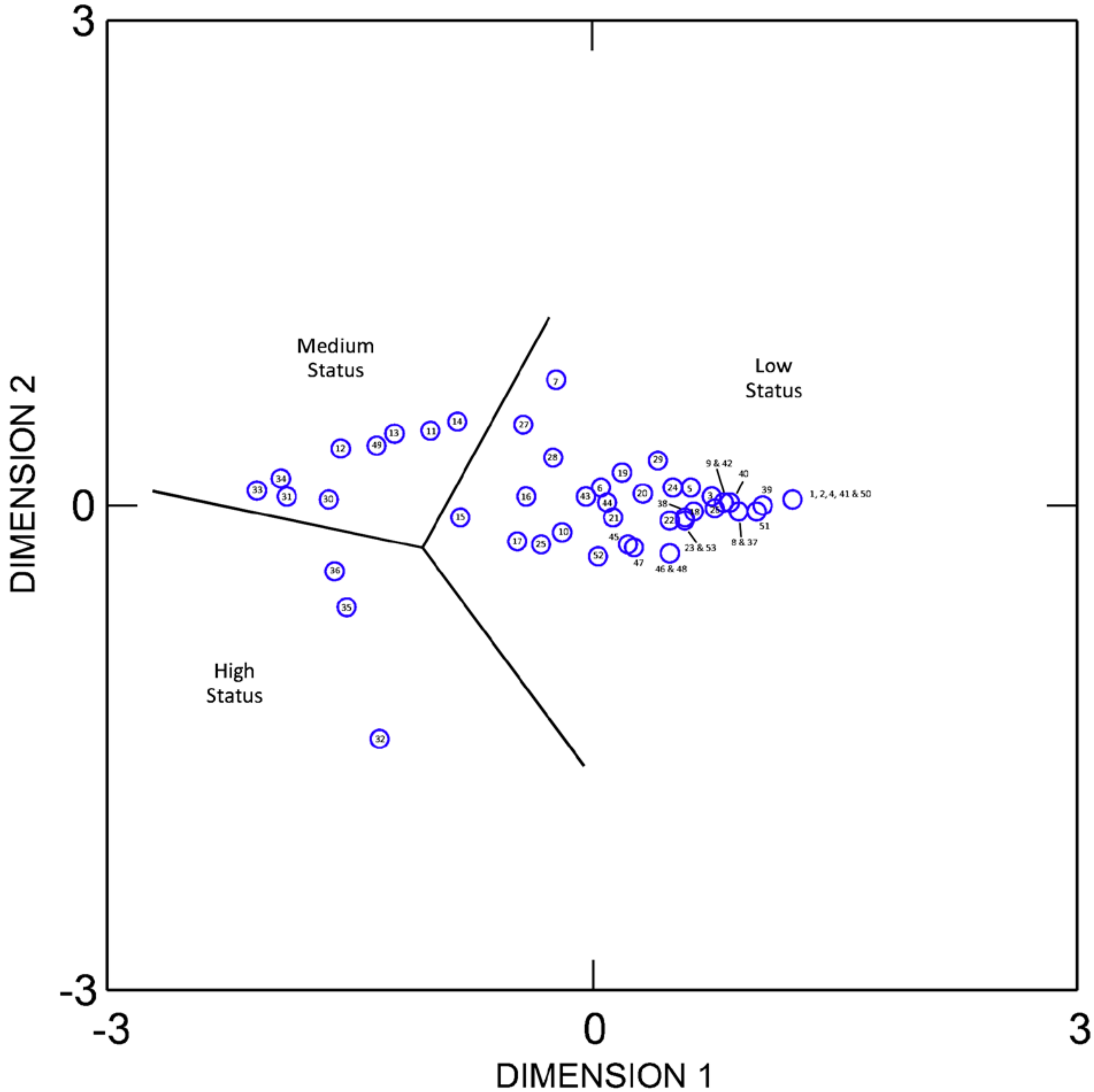

Figure 7.8 Status groups plot

Table 7.8 Average proportions of ceramic investment types per status group

Status Group	Case #	Low	Medium	High
High	32, 35, 36	20.19	25.00	54.81
Medium	7, 11, 12, 13, 14, 15, 27, 30, 31, 33, 34, 49	36.88	37.12	26.00
Low	1, 2, 3, 4, 5, 6, 8, 9, 10, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 52, 53	79.85	12.35	7.80

These results are consistent with the observations already made in the sections of Chapter 6 devoted to each site. This plot shows the relative consistency or homogeneity of the ceramic assemblages through the levels. The plot also shows the increase in Low Investment sherds and the decrease on High Investment sherds on the upper levels, a situation that I will call "impoverishment" but in relation to social status, rather than wealth.

These points might be better illustrated if one picks up the test pits that have deeper deposits and trace the position on the plot of their levels from the deeper to the upper ones. For example, test pit 31.02.01 (cases 36 to 27, the red line in Figure 7.9 left side), the higher status test pit, constitutes by itself the High status group and also the Medium group (where the cases are extremely close to the High status group). Those cases correspond to the levels from 100 to 30 cm. But then in the upper 30 cm, this unit's levels are part of the Low group (case 29 and 27, 30-0 cm level).

A somewhat similar situation occurs with the test pit 29.01.02 (cases 17 to 8, the blue line in Figure 7.9 left side). The deepest levels fall into the Low group (cases 17 and 15, 120-70 cm). The next four levels (cases 15 to 11, 70-30 cm) are part of the Medium group. Then, the uppermost levels are part of the Low group (case 10 to 8, 30-0cm), and in fact, the last two levels are very close to the lowest status extreme.

A unit with less visible clarity is 29.01.01 (case 7 to 1, the green line in Figure 7.9 left side), whose levels fall out within the Low group, moving progressively in the upper levels towards lowest status extreme.

An interesting case is 31.02.07 (cases 49 to 41, the red line in Figure 7.9 right side). Here, levels start in the Medium group and conclude in the Low group (in its lowest extreme). From the 80 to 30 cm depth (cases 48 to 43) the levels fall within a cluster in the Low Group, and then in the upper two levels (cases 42 and 41, 20-0 cm) the scores move downward.

Finally, test pit 29.01.03 (case 22 to 18, the green line in Figure 7.9 right side) displays no changes through time. The levels from this unit are all restricted to just the Low status group.

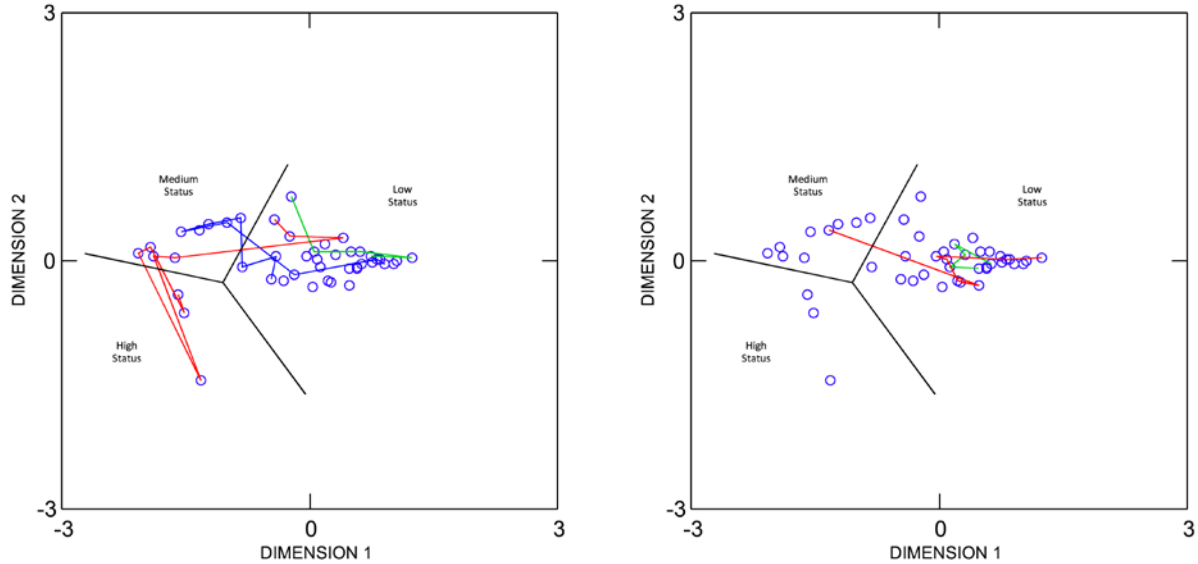

Figure 7.9 Status ploting for test pits 31.02.01, 29.01.02, and 29.01.01, 31.02.07 and 29.01.03

In consideration of the dramatic differences in the ceramic assemblages from the upper 30 cm of each unit, I decided to re-run the MDS analysis, but now excluding those levels. My objective was to test if the levels below that threshold show a higher consistency.

For this analysis I used the same data already outlined (and the same case numbers), with the same parameters. This sample was formed then, of 27 cases. The 2 dimension solution has a final stress value of 0.036 (while, the 1 dimension is 0.148). I opted for the 2 dimension solution (Figure 7.10).

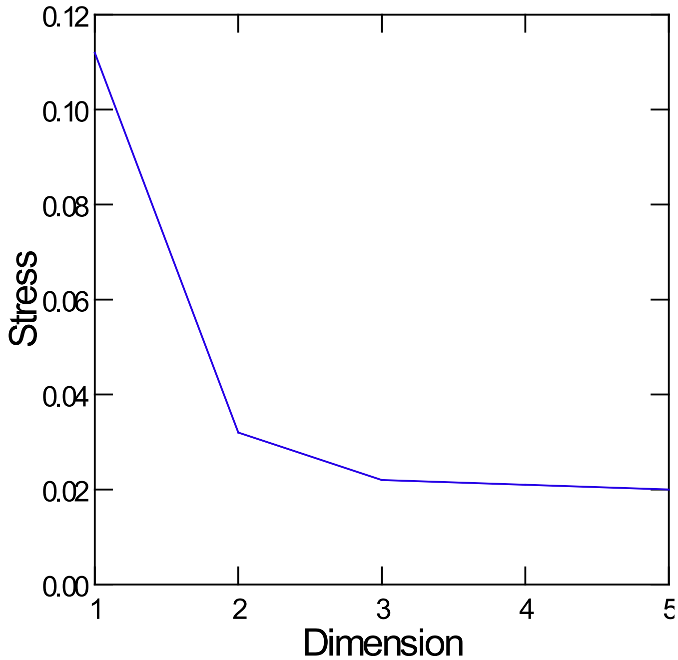

Figure 7.10 Graph of declining final stress values

The plot for each one of the variables (that is, ceramic investment types) are in green for the Low Investment sherds, in blue for the Medium Investment sherds, and in red for the High Investment sherds. The size of each circle refers to its value proportion (Figure 7.11). In this case I was able to recognize 3 groups (Figure 7.12 and Table 7.9).

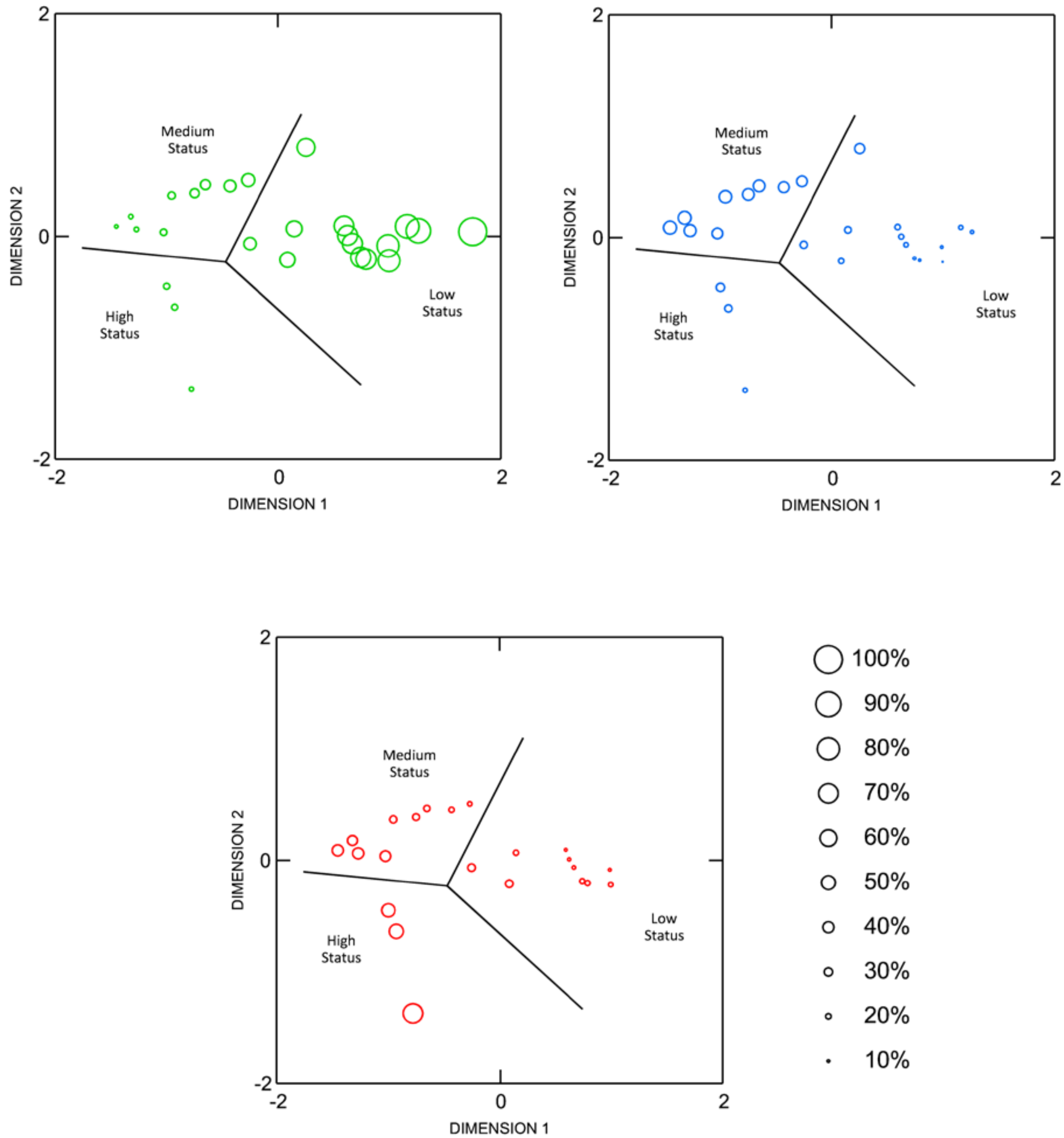

Figure 7.11 Plots for the ceramic investment types

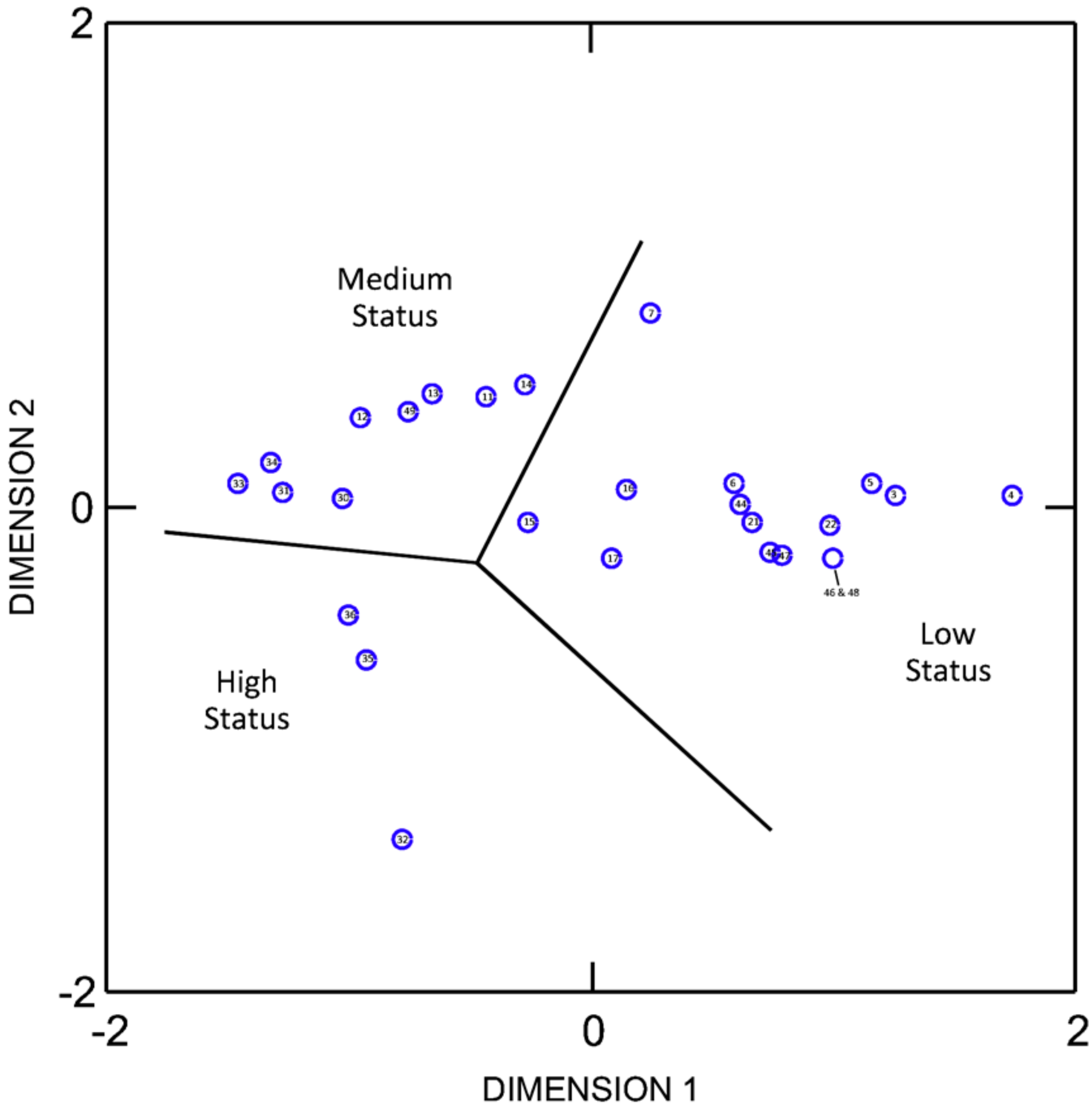

Figure 7.12 Status groups plot

Table 7.9 Average proportions of ceramic investment types per status group

Status Group	Case #	Low	Medium	High
High	32, 35, 36	20.19	25.00	54.81
Medium	7, 11, 12, 13, 14, 15, 16, 30, 31, 33, 34, 49	37.59	35.76	26.65
Low	3, 4, 5, 6, 17, 21, 22, 44, 45, 46, 47, 48	74.37	12.27	13.36

Those 3 groups capture in a tidy way the variability seen earlier among the different test pits. The levels from 31.02.01 (cases 36 to 30, the red line in Figure 7.13 left side) provide all of the High Status group cases and the higher ranking of the Medium Status group cases. The test pit 29.01.02 (cases 17 to 11, the blue line in Figure 7.13 left side) has levels that begin in the Low status group, before providing Medium status group cases.

A similar –but inverse- situation occurs with the levels of test pit 29.01.01 (case 7 to 3, the green line in Figure 7.13 left side) and 31.02.07 (cases 49 to 44, the line in Figure 7.13 right side). In these units, all of the deepest levels are close to the Medium status group, while upper lying levels are well situated within the Low Status group. Finally, the test pit 29.01.03 (cases 22 to 21, the green line in Figure 7.13 right side) provides levels exclusively within the Low status group.

In other words, this new plot shows that the diachronic change among levels within each unit that one can see in the previous analysis –when all the levels are considered- is notably reduced if one excludes the levels above 30 cm deep.

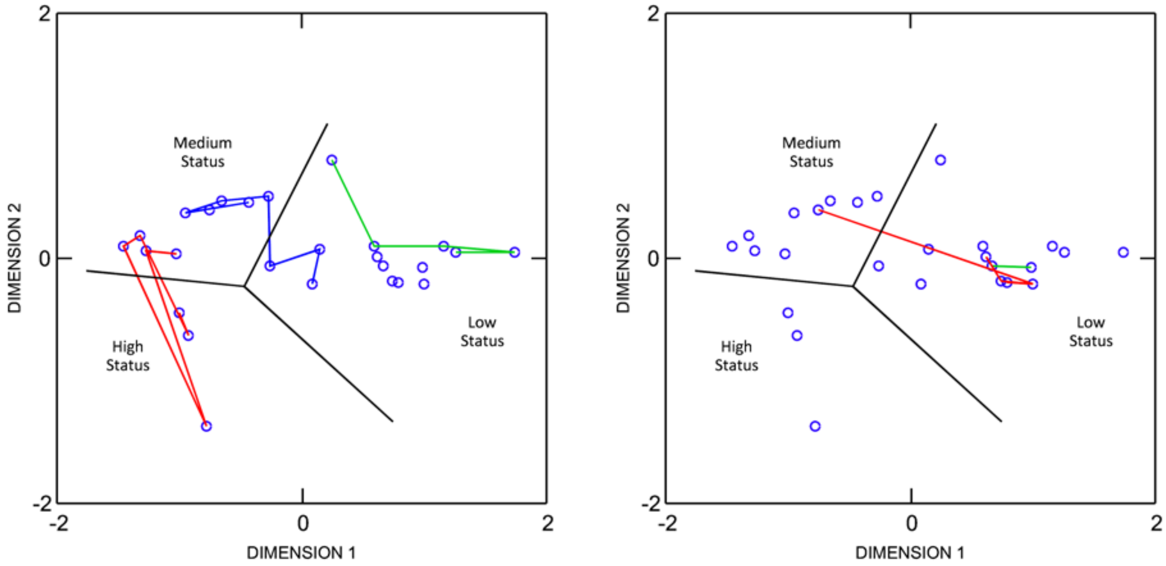

Figure 7.13 Status ploting for test pits 31.02.01, 29.01.02, and 29.01.01, 31.02.07 and 29.01.03

In conclusion, these analyses lend support to my supposition that the upper 30 cm of each unit, even though disturbed by plowing, provides very interesting and significant information. The investment indexes of the assemblages from these levels suggest that in the late moments of the native occupation of the island, a dramatic shift in native organization may have occurred.

Considering the dates obtained for P29-1 and P31-1, that shift should have happened no earlier than the 15th century, following roughly three centuries without such dramatic ceramic change.

This change could be representing the impact of the European arrival to Araucania. However, it is important to consider that my sample comes from just a sector of Isla Mocha and therefore this shift could be reflecting that this sector as a whole experimented a status “impoverishment”, (as measured in the consistent decline of High Investment pottery proportions) and not necessarily the entire island. This interpretation does not deny the plausible European impact but set a less mechanic link between these 2 situations. In fact, only a study including the whole of the island will reveal if what I have proposed characterized the entire island, or if the “impoverishment” in my research zone was accompanied by “enrichment” of another sector.

Finally, just as a reflective exercise, I ran the Multidimensional Scaling analysis with the 26 levels belonging to the upper 30 cm of each test pit. I opted for the 2 dimension solution (with a final stress value of 0.032) (Figure 7.14)

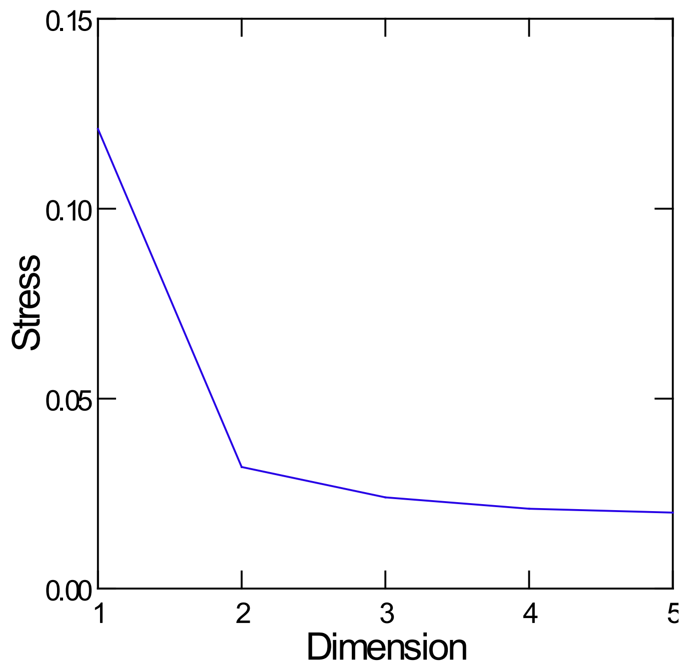

Figure 7.14 Graph of declining final stress values

The plots for each one of the variables (that is, ceramic investment types) are in green for the Low Investment sherds, in blue for the Medium Investment sherds, and in red for the High Investment sherds. The size of each circle refers to its value proportion (Figure 7.15). In this case I also identified 3 groups (Figure 7.16 and Table 7.10).

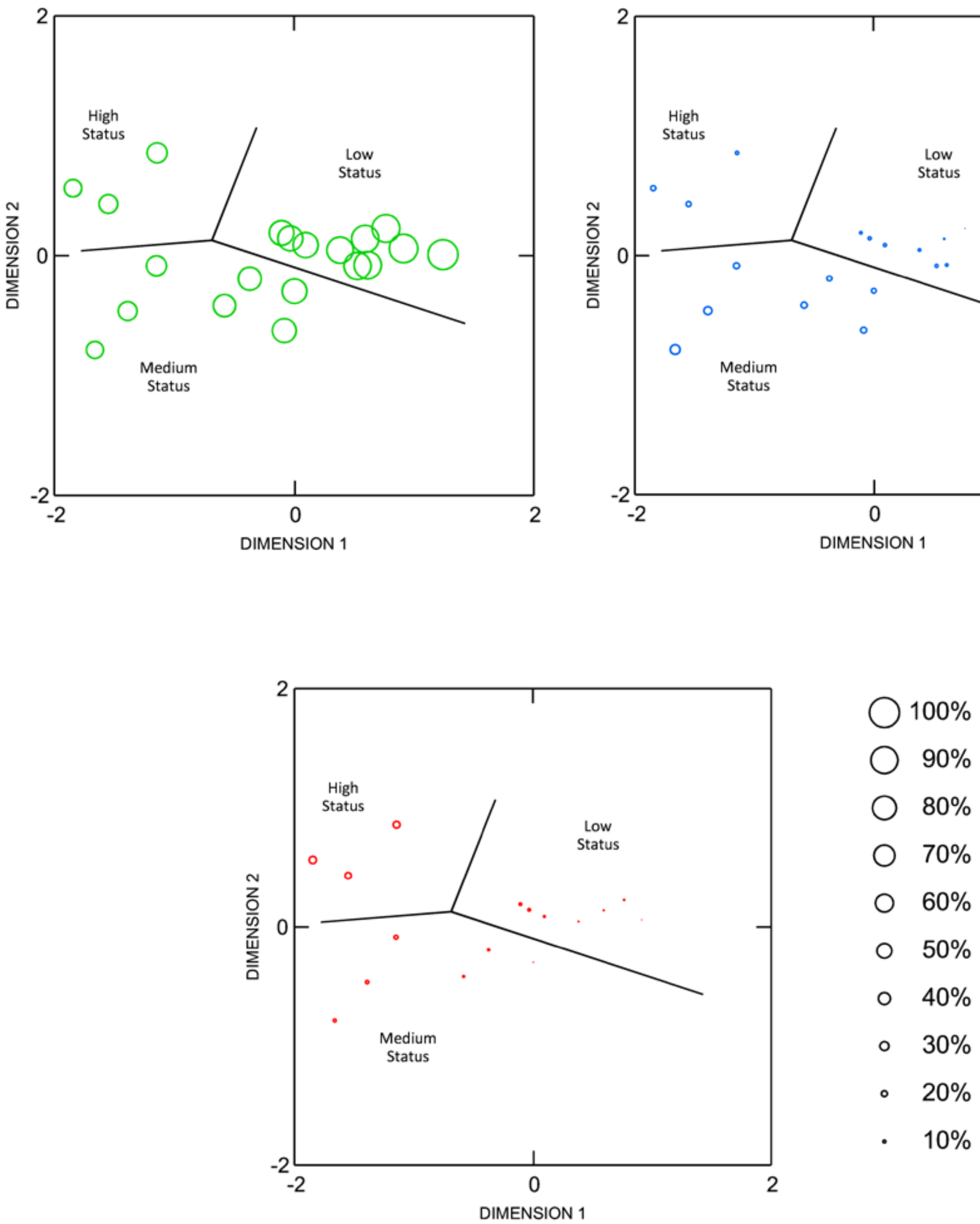

Figure 7.15 Plots for the ceramic investment types

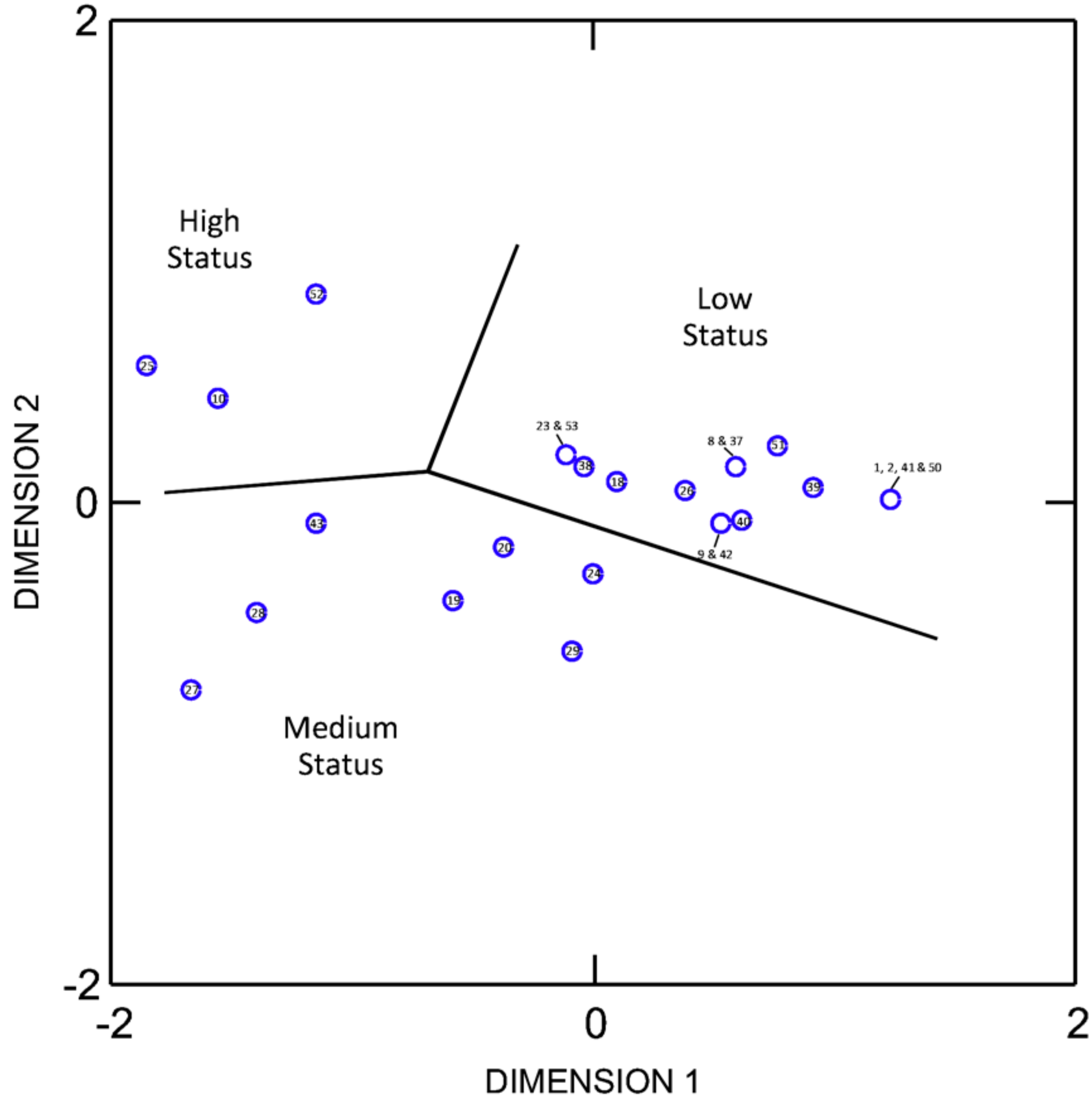

Figure 7.16 Status groups plot

Table 7.10 Average proportions of ceramic investment types per status group

Status Group	Case #	Low	Medium	High
High	10, 25, 43, 52	63.21	16.04	20.75
Medium	19,27, 28	66.96	25.00	8.04
Low	1, 2, 8, 9, 18, 20, 23, 24, 26, 29, 37, 38, 39, 40, 41, 42, 50, 51, 53	87.77	8.72	3.51

For starters, it is interesting to note the low proportion of High Investment sherds and the high proportion of Low Investment sherds that stand out as forming the High status group, in comparison to the previous analyses.

In other words, the High status group identified in this exercise is not high at all in the larger picture of levels from all depths. The "High" status cases in the upper levels would be between the Medium and Low status groups if all levels were figured into analysis. This illustrates my proposition of an "impoverishment" in the upper levels of P29-1 and P31-1.

Figure 7.17 helps to illustrate this point. In this graph, I compare the proportion of the 3 ceramic types (High, Medium, and Low Investment) in the deposit below and above 30 cm deep along the 3 status groups identified in the two last analyses.

It shows dramatically that in all cases but one, the differences between the deposits above and below 30 cm are significant at more than 99% confidence level. The only exception is Medium Investment sherds in the High Status group, where the difference is significant at more than 80% confidence level.

A point worth mentioning is that the cases corresponding to 31.02.01 (27, 28, and 29) do not fall within the identified High status group, but are in the Medium status group. On the other hand, 29.01.02 upper level cases fall into the Low status (cases 8 and 9) and the High status (case 10) groups. These changes show the shifting nature within the upper levels, because the generally High status assemblages of 31.02.01 and 29.01.02 did not persist into the upper levels. This shows that the "impoverishment" was not simply an across-the-board shift equally affecting all units, but that it also entailed changes in the relative status of the units.

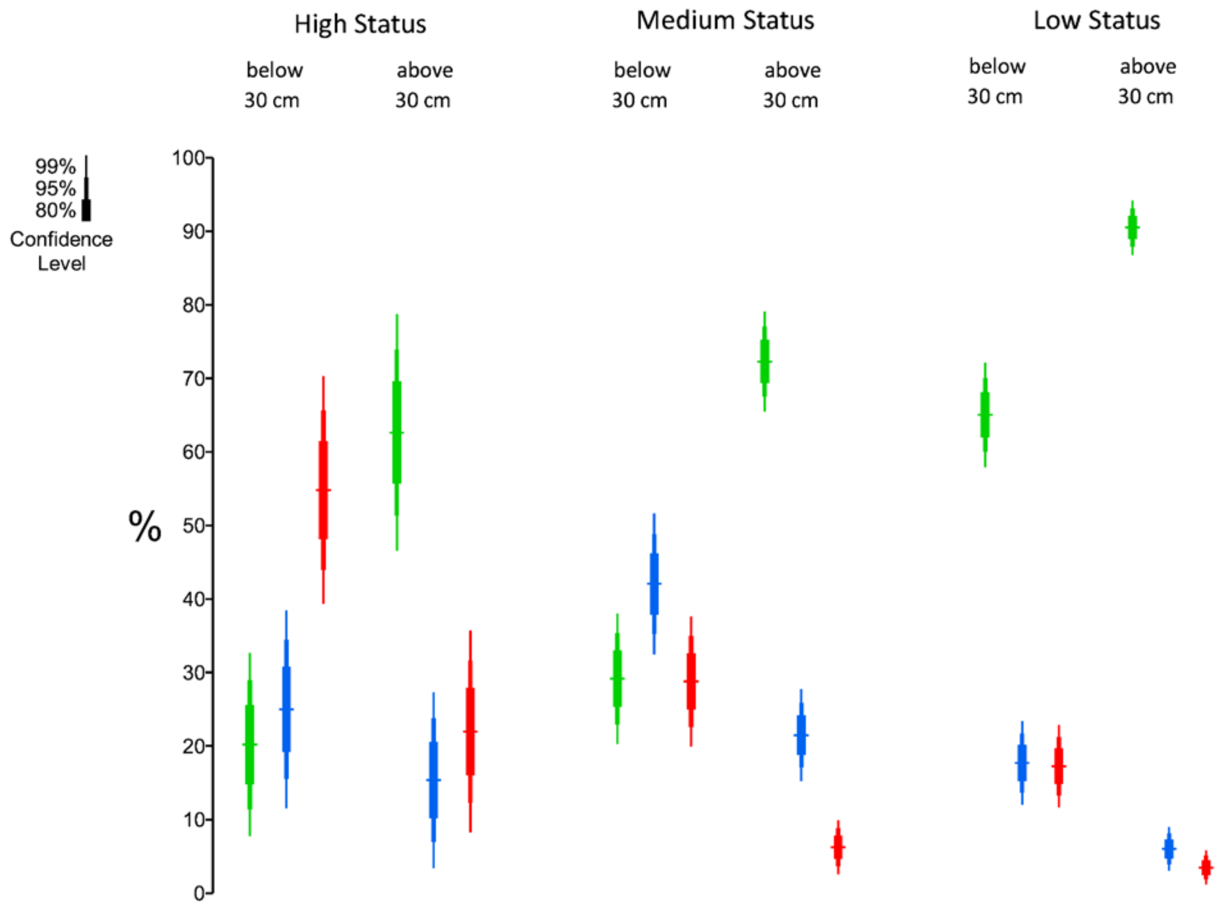

Figure 7.17 Below and above 30 cm depth proportions of ceramic investment types per status group

Concerning the temper analysis, I focused on just the four tempers that in Survey, Intensive Surface Collections and Test Pits presented in the higher proportions: Basalt, Quartz, Sand, and Shell (Figure 7.18).

The comparison of them across the different methodologies is difficult to understand given the significant differences that these tempers manifested at the same site. In other words, I was expecting at the level of each unit that this comparison would provide similar values, although not necessarily perfectly congruent. In this regard, the Intensive surface Collections was the technique that provided the most differing and extreme values. In fact, if one excludes Intensive surface Collections, the remaining values (Survey and Test Pits) are quite similar to one another and coherent.

At this point if one focus just in the Survey and Test Pits comparison, P29-1 show differences at less than 80% confidence level for Basalt, Quartz, and Sand. In the case of P31-1, only Shell presents a difference at less than 80% confidence level. This does not show a so more coherent pattern, but at least is less disrupting.

Finally, the test pits by themselves also –like the Survey results- give support to the idea that each site was producing ceramics locally. This is seen in the finding that the test pits from P29-1 and P31-1 present proportions for quartz, sand, and shell that differ at more than 99% confidence level.

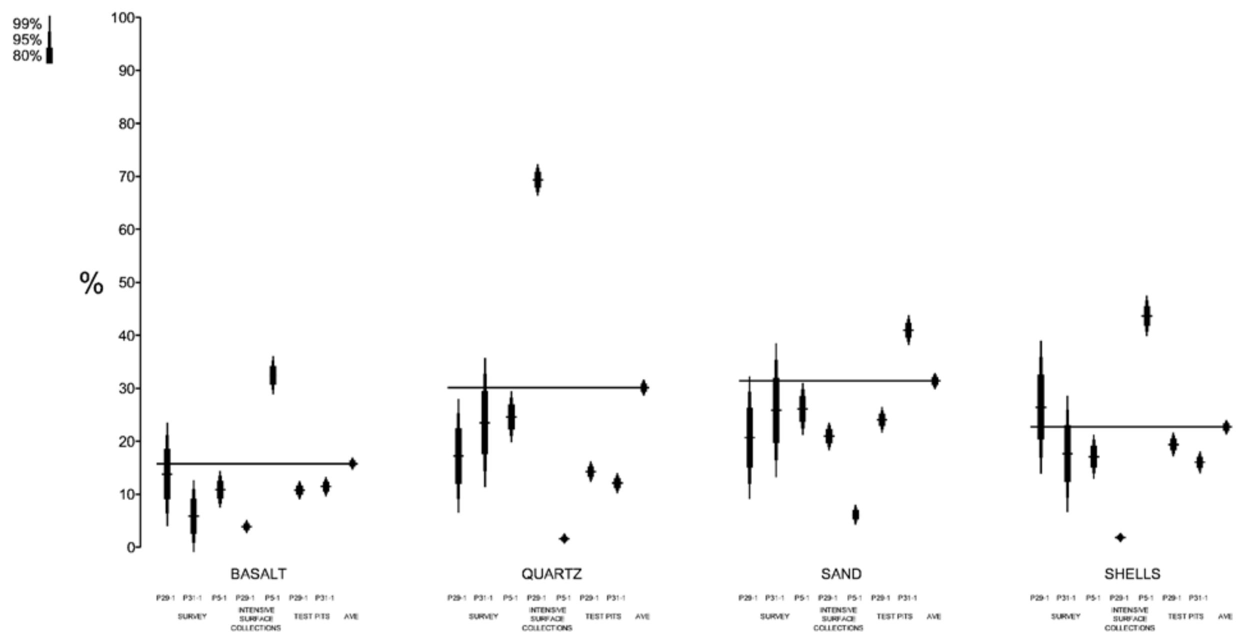

Figure 7.18 Proportions of ceramic tempers by collection technique per site

As discussed previously, the shape and rim analyses were not useful lines of evidence in making comparisons.

7.2 LITHICS

The three sites under study show that the local igneous rocks (Fine and Medium-and-Coarse grain) are the predominant lithic raw material in each of the methods implemented. In P29-1, their combined contribution is 73.08% in the Survey, 58.79% in the Intensive Surface Collection, and 85.81% in the Test Pits. In P31-1, the contribution is 76.61% in the Survey, 65.37% in the Intensive Surface Collections, and 79.10% in the Test Pits. In P5-1, the contribution is 76.69% in the Survey, 62.69% in the Intensive Surface Collections.

Beyond this pattern however, we can observe that the Survey and the Intensive Surface Collections at P29-1 and P31-1 show that the Medium-and-Coarse Grain Igneous Rocks are predominant over the Fine Grain ones (at more than 99% confidence level). However, in the Test Pits this situation is reverted (again, at more than 99% confidence level), suggesting a chronological aspect to lithic tool material choice.

In the case of P5-1, the Survey and Intensive Surface Collections, indicate that the Medium-and-Coarse Grain Igneous Rocks are predominant, although their differences with the Fine Grain ones is at less than an 80% confidence level.

The Figure 7.19 presents these comparisons. The left graph correspond to the Fine Grain Igneous Rocks, and the right graph, to the Medium-and-Coarse Grain Igneous Rocks. The bullets correspond for each site (from left to right) to the Survey, Intensive Surface Collections, and Test Pits (this last only for P29-1 and P31-1).

It is difficult to explain the inverse relationships concerning the Fine Grain Igneous Rocks and Medium-and-Coarse Grain Igneous Rocks at both sites when comparing the Intensive Surface Collections results with those of the Test Pits results. If one reduces the sample to just the upper 30 cm of deposit -considering the disturbing effect of plowing- this pattern still is visible.

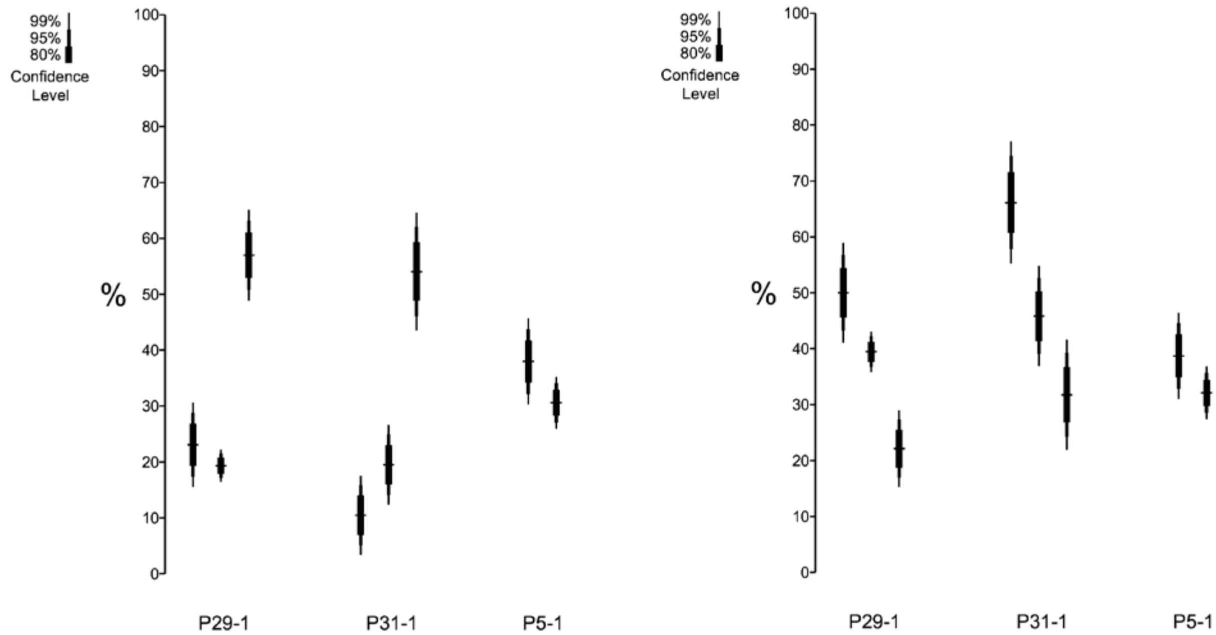

Figure 7.19 Proportions of Fine Grain Igneous rocks and Medium-and-Coarse Grain Igneous rocks

The remaining seven raw materials, present at the three sites, and by any of the recovery methods, mostly show proportions below 10%. The Quartz, Sandstone, Other Fine Grain Rocks, Obsidian, and Siliceous Rocks, have values between 11.44% and 2.87%, 5.35% and 0.00%, 2.45% and 0.00%, 2.05% and 0.00%, and 1.61% and 0.00%, respectively, which differed at less than 80% confidence level.

Granite, present only in the Intensive Surface Collection at P29-1, represents a proportion that differs at more than 99% confidence level from the Survey and Test Pits (22.5% versus an average of 6.48%). Beyond that, its values fluctuated between 22.5% and 5.41%.

Finally, the Other Coarse Grain Rocks present at P29-1 –by each method- shows proportions that differed at less than 80% confidence level. At P31-1, just the Intensive Surface Collections differed at more than 80% confidence level from the Test Pits. And at P5-1, we see the same situation but, in this case, between the Survey and Intensive Surface Collection proportions. Beyond that, its proportions fluctuated between 13.66% and 0.68%.

From another perspective, the results obtained from the P31-1 test pits can be contrasted with those of Jackson (1997). This effort entails adjusting my variables to his -

transforming my 9 raw materials into his 6, as indicated above. This rough comparison indicates mean difference between both P31-1 samples for the "Basalt" and Sandstone (at more than 99% confidence level), and the “Other Rocks” (at more than 80% confidence level). Beyond these discrepancies, both samples indicate a complete predominance of "basalt"; in my study it makes up 86.49%, and in Jackson’s study, 72.4%. The obsidian is present in extremely low proportions, and the silex, absent.

In Figure 7.20 the first bullet correspond to my study, the second to Jackson’s study.

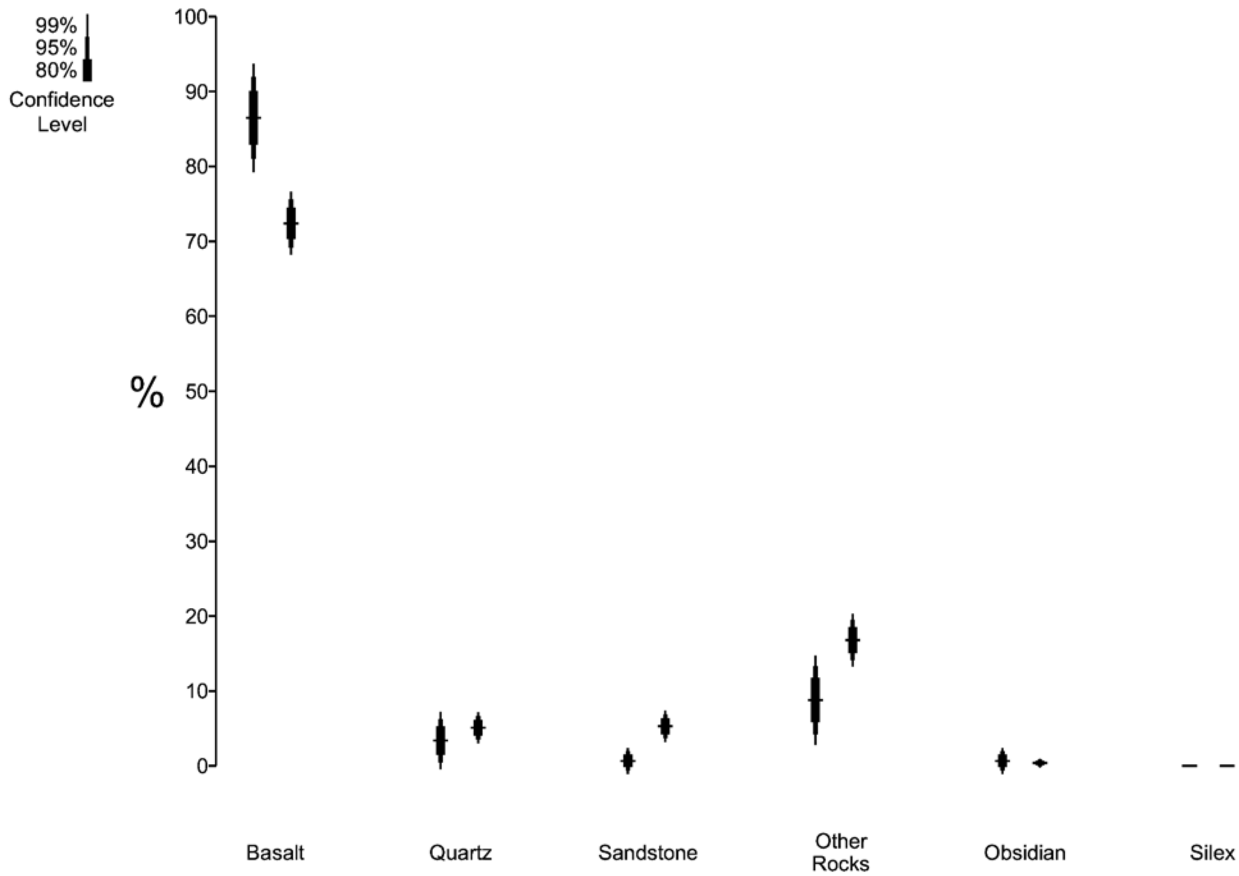

Figure 7.20 Proportions of lithic raw materials , since my study and Jackson´s 1997

In turning to considering the lithic manufacturing process, at each of the three sites, and through either the Intensive Surface Collections or the Test Pits (this last only for P29-1 and P31-1), there is a clear decreasing trend in proportions that replicates the lithic reduction chain.

In other words, a trend that starts with a high proportion of core debitage and goes down to marginal reduction debitage then bifacial reduction debitage to finish with the bifacial retouch debitage

Another approach using the lithic manufacturing process is to compare the results of the Intensive Surface Collections to those of the Test Pits at the level of each site. They show some significant differences (at more than 99% confidence level) between these two methodologies at the very same site. This constitutes an obstacle to drawing confident conclusions.

Figure 7.21 presents each debitage category plus the cores per site. For each site the first bullet corresponds to the Intensive Surface Collections and the second to the Test Pits; for P5-1, it only corresponds to the Intensive Surface Collections; the last bullet is the average proportion.

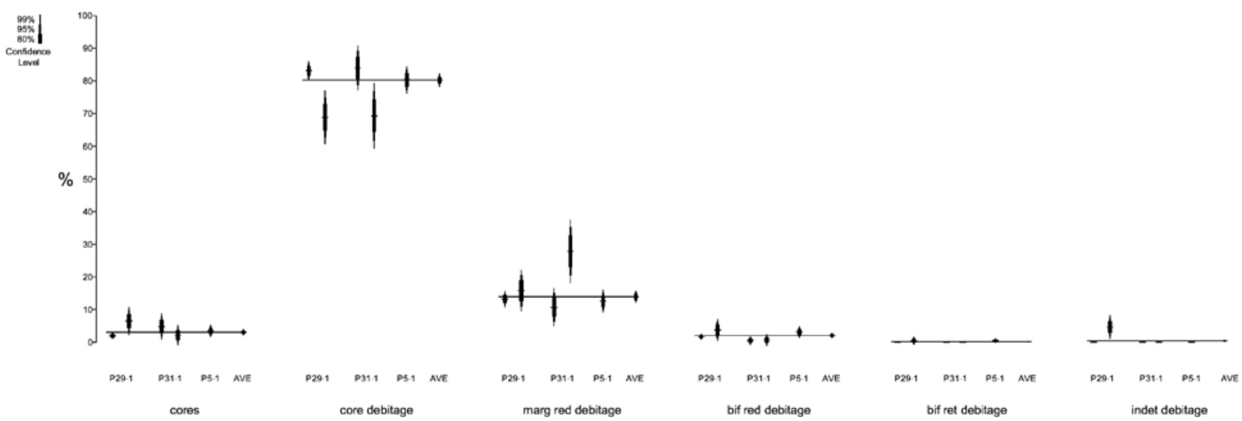

Figure 7.21 Proportions of cores and debitage by collection technique per site

Returning to the raw material distribution comparison, we can see that some of the differences relate to the different recovery methodologies implemented (Survey vs Intensive Surface Collections vs Test Pits). The local igneous rocks constitute the largest fraction of the lithic samples, and also were extensively used. At the opposite extreme, all sites have really low quantities of exotic raw material.

In relation to the manufacturing process, one could argue that the results do not allow formulating differences between the sites, and therefore residents at each site were involved at the same level in lithic manufacture. In other words, none of the sites seem to have concentrated certain steps or activity related to lithic manufacture (specialization).

Finally, as already mentioned in the relevant sections earlier, the low quantity of lithic tools recovered as part of the Intensive Surface Collections and of the Test Pits do not allow us to draw clear and confident differences between these two sites concerning the activities carried out at each one.

These results as a whole are not greatly suggestive of differences between these sites concerning in lithics assemblages. Neither the raw materials, the manufacturing stages, nor the tools assemblages allow singling out of a certain site in terms of lithic utilization. The only possible exception is, as noted above, the higher ratios of lithics to sherds at P29-1 could suggest a slightly more intensive involvement in the lithic industry than the other sites.

7.3 FAUNAL REMAINS

In considering the faunal remains, analysis is constrained by the large proportions of mammal bone in each assemblage that had to be classified as Indeterminate or just at the level of Class.

In the Intensive Surface Collections at P31-1 and P29-1 (and also P5-1), the mammal remains constituted almost the entire samples collected (between 96% and a 100%), with the other remains corresponding to birds and fishes (bony and cartilaginous), with values below 1.5%. In this context, is important to remember the absence of large mammals native to the island. In fact, the only native mammals are small rodents, and in these samples, rodent remains were virtually absent.

Therefore it is suggestive to think that most mammal remains –even if they are Indeterminate- correspond to introduced mammals. Given this, camelids appear as the predominant taxa, giving support to the notion that camelids featured extensively in the native economy.

The Test Pits evidence presents the same general pattern described above for surface contexts, but at the same time, differs from it in certain aspects. The amount of remains not identifiable beyond the Class level –or categorized as Indeterminate- is still significant, so we must still temper our conclusions.

At the level of the identified specimens (NISP), the Test Pits at P29-1 and P31-1 show that mammal and fish remains are the main contributors to the sample (Figure 7.22). In the case at P29-1, this representation is 44.58% and 51.70%, and at P31-1, 43.92% and 39.19%, respectively. In this context, P31-1 departs from P29-1 in having a higher proportion of bird remains (12.84% and 2.63%, respectively).

The under-representation of fish and bird bone in the Intensive Surface Collections, in contrast to the Test Pits, can be related to the relative fragility of this bone in surface contexts. Therefore to make a more reliable and significant faunal assessment, it is necessary to focus on the Test Pits.

As seen in the Intensive Surface Collections, camelids constituted an always significant contribution to the faunal assemblages. However, the Test Pits also indicate that camelids were complemented by fish. Among these, apparently the most important were *Aphos porosus* and *Sebastes capensis*.

The P29-1 test pits present a larger variety of fish species (n=13), in contrast with P31-1 test pits (n=3). This situation parallels how the Intensive Collections units at P29-1 yielded more fish taxa (n=5) than P31-1 (n=0). But at the same time, as indicated, P31-1 test pits show a larger contribution of bird remains to the faunal assemblages.

These meat consumption differences are probably the most clear and strongest inter-site differences discovered by my study of faunal assemblages. Indeed, from the test pits the proportions of birds and fishes at these two sites –and including those classed as Indeterminate- show a difference at more than 99% confidence level for the birds, and at more than 95% confidence level for the fish; while mammals proportions are extremely similar. However, it is difficult as of yet to draw some social implications from these differences in the faunal assemblages.

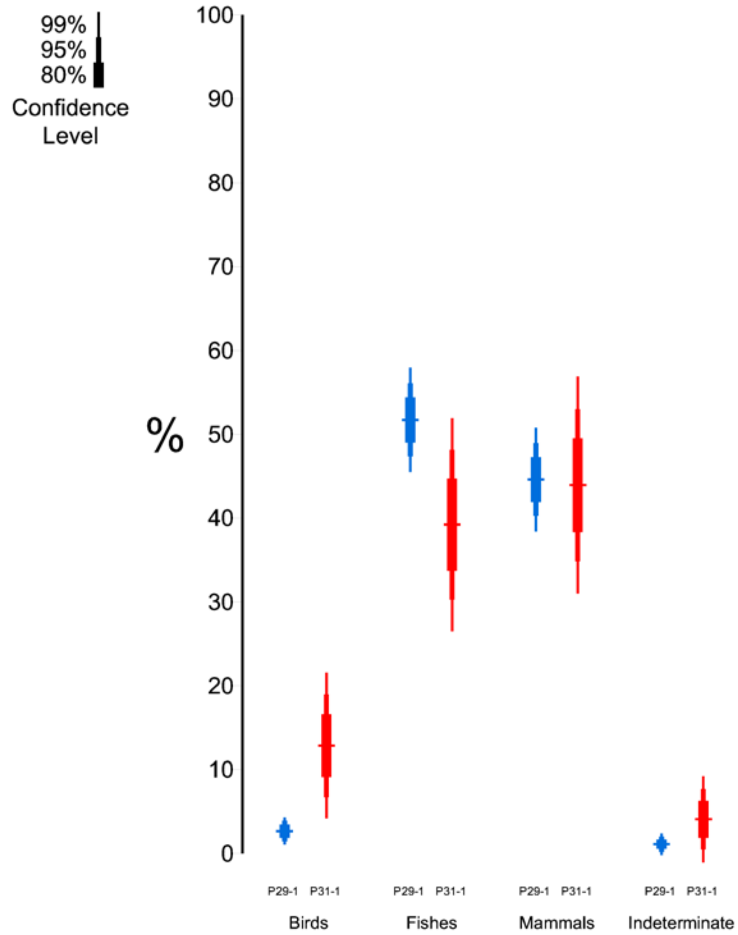

Figure 7.22 Proportions of faunal remains per class at each site test pits

7.4 PALEOBOTANY

The paleobotanical evidence reveals as a whole the use of a combination of cultivated and wild species. For comparing P29-1 and P31-1 I will use the ubiquity index. I will restrict the samples to just those levels with charred (carbonized) remains and/or interpreted as corresponding to the native occupation, as was discussed in Chapter 6.

An inconvenience to direct chronological comparisons is the problem at P29-1 of "inverted" 14C dates, and uncertainty whether the site was occupied right up until depopulation in AD 1687. However, from the same 14C dates it is possible to distinguish at both sites roughly two periods. For P29-1, the first period runs from at least AD 1049 to AD 1384, and for P31-1, from AD 1214 to AD 1399. A second period, for P29-1 runs from AD 1384 to –as I am proposing- to AD 1687, and for P31-1, from AD 1399 to AD 1687. In other words, pre- and a post-AD 1400 periods.

For the first period (prehistoric, AD 1050-1400) the ubiquity values are outlined in Table 7.11 and Figure 7.23. For the second period (proto-historic and historic, AD 1400-1687) the ubiquity values are outlined in Table 7.12 and Figure 7.24.

Table 7.11 Charred botanical macro remains ubiquity for P29-1 and P31-1, pre-AD 1400 period

P29-1		
Taxa	**# of levels 4A-8B (10) AD 1049-1384**	**Ubiquity**
Rubus sp.	10	100.00
Chenopodium sp.	8	80.00
Chenopodium quinoa	7	70.00
Typha angustifolia	5	50.00
Fragaria chiloensis	4	40.00
Polygonaceae	4	40.00
Poaceae	4	40.00
Fragaria aff. *chiloensis*	3	30.00
Fabaceae	3	30.00
Cryptocarya alba	2	20.00
Rosaceae	2	20.00
Ugni molinae	2	20.00
Aristotelia chilensis	1	10.00
Gevuina avellana	1	10.00
Luzuriaga radicans	1	10.00
Phaseolus vulgaris	1	10.00
Typha aff. *angustifolia*	1	10.00
Zea mays	1	10.00

P31-1		
Taxa	**# of levels 7A-10B (8) AD 1214-1399**	**Ubiquity**
Chenopodium quinoa	8	100.00
Chenopodium sp.	6	75.00
Rubus sp.	4	50.00
Muehlenbeckia hastulata	3	37.50
Fragaria chiloensis	3	37.50
Ugni molinae	3	37.50
Typha angustifolia	3	37.50
Drimys winteri	2	25.00
Fabaceae	1	12.50
Gevuina avellana	1	12.50
Cryptocarya alba	1	12.50

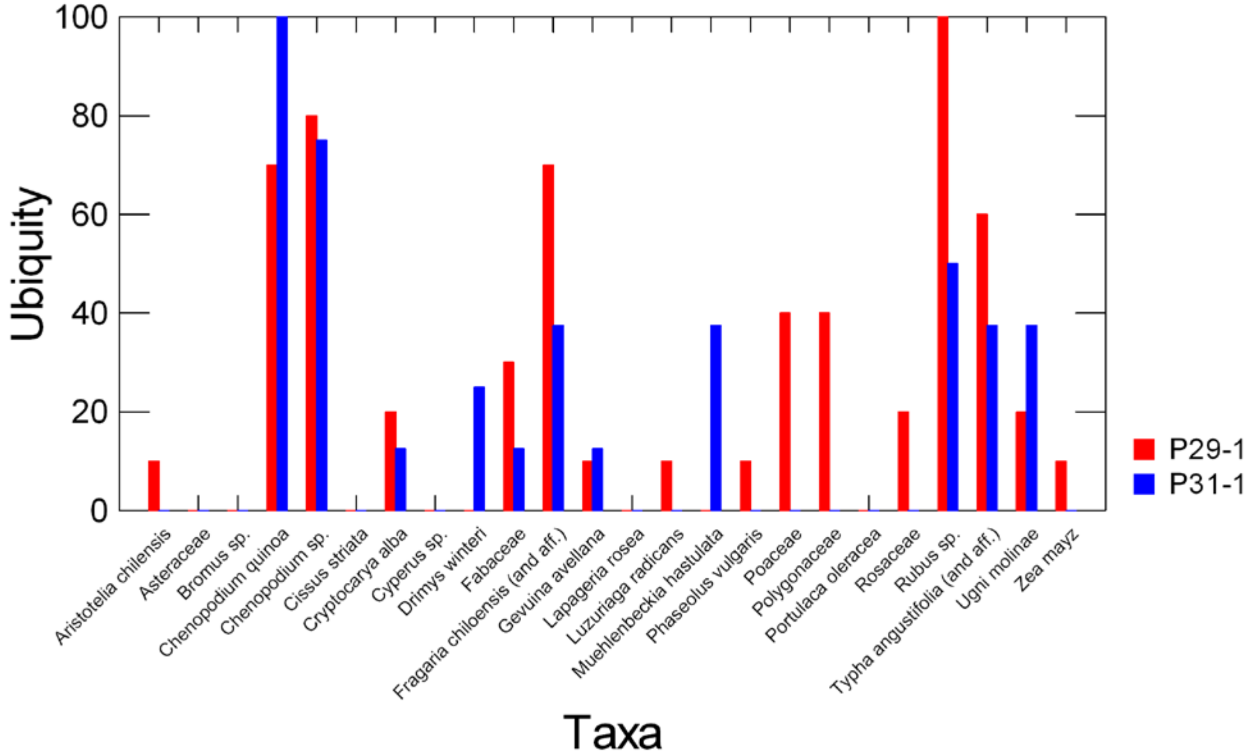

Figure 7.23 Charred botanical macro remains ubiquity for P29-1 and P31-1, pre-AD 1400 period

Table 7.12 Charred botanical macro remains ubiquity for P29-1 and P31-1, post-AD 1400 period

P29-1		
Taxa	**# of levels 2B-3B (3) AD 1384-1687?**	**Ubiquity**
Rubus sp.	3	100.00
Chenopodium quinoa	3	100.00
Fragaria chiloensis	3	100.00
Chenopodium sp.	2	66.66
Typha angustifolia	2	66.66
Polygonaceae	1	33.33
Cryptocarya alba	1	33.33
Rosaceae	1	33.33
Zea aff. *mays*	1	33.33

P31-1		
Taxa	**# of levels 3B-6B (7) AD 1399-1687?**	**Ubiquity**
Chenopodium quinoa	7	100.00
Chenopodium sp.	7	100.00
Zea mays	6	85.71
Asteraceae	5	71.43
Muehlenbeckia hastulata	4	57.14
Fragaria chiloensis	3	42.86
Ugni molinae	3	42.86
Typha angustifolia	2	28.57
Bromus sp.	2	28.57
Drimys winteri	1	14.29
Fabaceae	1	14.29
Gevuina avellana	1	14.29
Cyperus sp.	1	14.29
Aristotelia chilensis	1	14.29
Cissus striata	1	14.29
Lapageria rosea	1	14.29
Portulaca oleracea	1	14.29

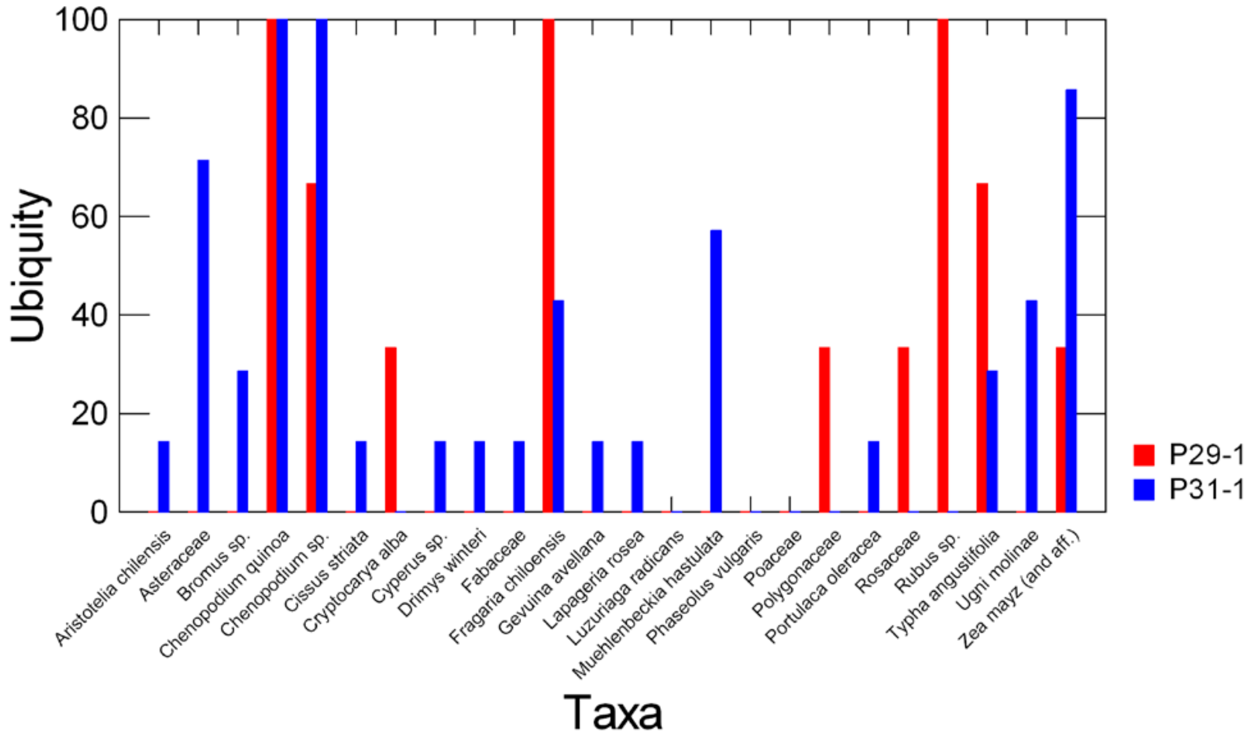

Figure 7.24 Charred botanical macro remains ubiquity for P29-1 and P31-1, post-AD 1400 period

Presented in this way, this botanical sample reveals very interesting and suggestive information. I will refer first to the three identified crops: quinoa, maize, and beans. In both sites, before and after the AD 1400 milestone, quinoa displays very high ubiquity values, which go no lower than 70%, and with a combined ubiquity value –considering all levels- of 89% (25 levels out of 28). In other words, quinoa appears to be a true and widespread staple crop during all the period under study.

The situation with maize is completely different. In this case, prior to AD 1400, it only achieves a ubiquity of 10% at P29-1, while it is absent from P31-1. In contrast, after that date, at P29-1 only a taxa affine to *Zea mays* was identified, with a 33% ubiquity; while at P31-1-1 maize reached a 86% ubiquity. This situation might be revealing two phenomena. The first process is a clear increase in the consumption of maize at both sites from the pre- to the post-AD 1400 period. The second process is, that in the post-AD 1400 period, there is clearly more maize consumption at the P31-1 than at P29-1.

Finally, beans only appear at P29-1 in the pre-AD 1400 period, and with a ubiquity of just 10%. This is very interesting because this was a crop widely reported as cultivated in ethnohistoric times, and therefore one should expect its presence in the post-AD 1400 period also. The taxa identified as *Chenopodium* sp. which is present in both periods and sites, and has an ubiquity that fluctuates between 100% and 67%, remains as a mistery.

In conclusion, from the crop evidence, one can argue that quinoa was indeed the main and most universal botanical resource from at least the 13th century until the depopulation. Meanwhile, maize was a relatively limited one, particularly from AD 1400 onwards.

Concerning the remaining wild resources, *Fragaria chiloensis*, *Rubus* sp., *Typha angustifolia*, and *Muehlenbeckia hastulata* all well represented, with some differences between the sites. At P29-1 in the pre-AD 1400 period, for example, *Fragaria chiloensis*, reached a ubiquity of 40% (or even 70% if its affine is included) and after AD 1400 of 100%; meanwhile at P31-1 in both periods its ubiquity was around 40%. The situation with *Rubus* sp. is similar, reaching a ubiquity of 100% in both periods at P29-1. In contrast, at P31-1 is only present before AD 1400 with a ubiquity of 50%. *Typha angustifolia* replicates this pattern to a lesser extent. At P29-1 pre-AD 1400 it has a ubiquity of 50% -or 60% if it is combined with its affine taxa- and post-AD 1400 of 67%. In contrast at P31-1 those values are 38% and 29%, respectively. *Muehlenbeckia hastulata*, is present only at P31-1, with a ubiquity of 38% before AD-1400, and of 57% after AD 1400.

These differences could be related to local floral resources most available at each site and/or to activities or preferences not easy to delineate at this moment. In any case, and assuming that these plants were collected for food, the differences suggest dietary variation between these two sites. For example, *Fragaria chiloensis* is known to be used in the production of chicha, so that its increase at P29-1 in the post-AD 1400 period, might parallel the increase in maize at P31-1, as suggesting increased chicha production.

Typha angustifolia, on the other hand, is an economic plant used historically in the construction of rafts. Thus its presence at both sites might be reflecting a shared access to this valuable raw material. Lastly, the presence of *Muehlenbeckia hastulata* only at P31-1 –in both periods- is interesting given the fact that this is one of three species (along with *Cryptocarya alba* and *Lapageria rosea*) that might not be local to Isla Mocha, and therefore must have been transported from the mainland.

Finally, eight species -*Aristotelia chilensis*, *Cissus striata*, *Cryptocarya alba*, *Drimys winteri*, *Gevuina avellana*, *Lapageria rosea*, *Luzuriaga radicans*, and *Ugni molinae*-, present ubiquity values between 43% and 10%. Given the low representation of these species is difficult to draw an argument in relation to the presence or absence of them in one site and not at the other, or to assess their dietary significance. At the same time, however, the variety as a whole reflects the diversified use of the non-cultivated resources made by the Isla Mocha native inhabitants.

Concerning the other two species that are not local to Isla Mocha, *Cryptocarya alba* is absent only at P31-1 after AD 1400, meanwhile *Lapageria rosea* is only present at that site in that post AD 1400 period.

7.5 QUINOA CULTIVATION AND POPULATION ESTIMATES

Given the economic and dietary importance that I am attributing to quinoa, it becomes relevant to consider its planting requirements and productive capacity relative to estimated population in my research zone. In order to calculate such figures, I will model different scenarios for this crop.

According to Rea et al. (1979:117) the yield of quinoa in traditional conditions is between 600 to 800 kg per ha. The nutritional content of quinoa has been calculated with differing figures, between 3510 kcal/kg (Wu Leung and Flores 1961, cited in Wernke and Whitmore 2009:431) and 3990 kcal/kg (Jancurová et al. 2009:73). Given these values, 1 ha of cultivated quinoa provides between 2106000 and 3192000 kcal per year.

On the other hand, according to FAO/WHO/UNU (1985) the recommended daily intake for a person is 2200 kcal. This value is an ideal intake, well above, for example, the 1530 kcal used by Hastorf (1993:72), which is based on ethnographic research done by Thomas (1973). To avoid an undesired under-estimate, I will use the FAO/WHO/UNU value. Given this, one person should consume 803000 kcal per year.

Drawing from these values, one can propose different scenarios depending on how much importance one gives to quinoa, as measured in its kcal contribution to diet. Then one can use that information to explore different population estimates and the issue of how the territory was occupied and the amount of land required at different population estimates. I will consider 4 population estimates (500, 1000, and 1500 people) to capture the population range that, according to my research of the ethnohistoric sources, has been assigned to Isla Mocha

Isla Mocha as a whole has an area of about 50 km^2, but excluding the stepped and forested central range, the uninhabitable area becomes 25 km^2. For that area then, from the ethnohistoric sources I estimated a population between 600 to 2000 people. Therefore, in my 6 km^2 research -one fourth of the island's inhabitable area- may have lived between 150 and 500 people.

Table 7.13 presents these population estimates –at the island and research area level- at the different quinoa contribution scenarios.

Table 7.13 Isla Mocha population estimates at different quinoa contribution scenarios

Quinoa contribution	1 person	150 people	500 people	600 people	2000 people
803000 kcal (100% contribution)	0.25 to 0.38 ha	38 to 57 ha	125 to 190 ha	150 to 228 ha	500 to 760 ha
602250 kcal (75% contribution)	0.19 to 0.29 ha	29 to 44 ha	95 to 145 ha	114 to 174 ha	380 to 580 ha
401500 kcal (50% contribution)	0.13 to 0.19 ha	20 to 29 ha	65 to 95 ha	78 to 114 ha	260 to 380 ha

In the case of my research area, the required lands for quinoa cultivation would consist of the semi-empty areas that lie between P29-1 and P31-1 and between P31-1 and P5-1. These spaces can be estimated at about 1 km^2 (100 ha) each. In this calculation, I am excluding the lands below the 25 masl, which correspond to a very sandy soil, and even today are not used for agriculture. Therefore, the 150 people estimate is met in each of the three scenarios by local quinoa production, and the 500 people estimate only at a 50% quinoa contribution. If the population was 500 or more people, there was not enough arable land for this population to be supported only through quinoa production.

In fact, as has been discussed, diet was not based only on quinoa; other crops –as maize and beans- and wild species were also consumed. Additionally, my research did not provide any samples of *Solanum tuberosum* (potatoes). However it is very likely that this species formed part of the Isla Mocha native inhabitant's economy, as the ethnohistoric record indicates. In this case, its absence from the archaeological record can be explained by preservational issues, including the plant's lack of seeds that might become carbonized.

Modern ethnographic evidence from mainland Araucania mentions an agricultural complex that makes use of quinoa, maize, beans, and potatoes. In Alfonso and Bazile words (2009:65): "the quinoa accompanies the maize, the beans, and the potatoes, and besides it protects the potatoes from direct sunlight and heat during the summer".

The supposition of an extensive area under cultivation at Isla Mocha is consistent with the ethnohistoric descriptions, which emphasize the high productivity of the land. However, at the same time, it is surprising that no ethnohistoric source mentioned the quinoa in context of Isla Mocha. One possibility is that Europeans initially failed to identify quinoa as a crop or, perhaps, misidentified it with wheat or barley. The early Europeans as well might have been less interested in quinoa because of the cumbersome process needed to make quinoa edible; it is necessary to remove the saponin that covers the seeds. The Europeans likely preferred goods that required less processing and were more amenable to immediate return, as potatoes, maize, and fruits.

In fact, Planella and Tagle (2002) mention a storage technique for quinoa used in Central Chile by small scale farmers that may be relevant to the Isla Mocha case. This technique consists of hanging the quinoa stems with the unprocessed grains. In those cases, the saponin cover protects the grains from insects and rodents, and the grains are cleaned and processed only on demand.

Another way to approach population estimates for Isla Mocha, is through comparison with Dillehay's (2007) research. From his studies in Puren-Lumaco valley he proposes that a family consisted of an average 7 individuals, and occupied an area of half an hectare.

With these numbers, I can make some population estimates, taking into consideration the areas assigned to the Isla Mocha sites from the survey densities. For P29-1, with an estimated area of 8.56 ha, these figures would imply a population of 120 people; for P31-1, with an estimated area of 10.96 ha, a population of 153 people; and for P5-1, with an estimated area of 17.74 ha, a population of at least 248 people. This would imply for my research area (6 km^2) a population of 521 people. With my zone constituting one-fourth of the uninhabitable area of the island (25 km^2), this yields a population estimate of 2084 people for the island.

While these results are above most of my ethnohisoric estimates, it is important to remember that Puren-Lumaco is described as Dillehay as an important demographic and political node in Araucania. Perhaps, therefore his population estimates are not so easy to extrapolate to another place. In fact, keeping Dillehay's proposition of one family per half an hectare, one could adjust this to the Isla Mocha ethnohistoric depopulation census (AD 1685). In that case a family would be constituted by 5 individuals. Then, for P29-1 one should expect a population of up to 86 people, for P31-1, of up to 110 people, and for P5-1, of at least 177 people. This would mean for my research area a population of 373, and for Isla Mocha as a whole, of 1492 people.

Under either family estimate, 5 or 7 individuals, we can also assume that a family can be equated to a domestic unit. Therefore, Dillehay's proposition can also be read as that one domestic unit occupied half an hectare. Then, it would imply the presence of 17, 22, and 36 domestic units, at P29-1, P31-1, and P5-1, respectively. In that case any of the sizes estimated for the Araucanian domestic units allows a significant "free space" around them at each site.

Beyond the fact that one considers people, families, or domestic units, all these estimates have to be taken as maximum range expectations. Overall, it is likely, using more conservative estimates, to estimate my research area population at somewhat below the 373 individuals, and at the island population as a whole, below 1492 individuals.

8.0 CONCLUSIONS

My research aimed at documenting Isla Mocha settlement and exploring household and suprahousehold status and economic variation. In this chapter, I summarize the results of this research in terms of my original research questions, and discuss the implication of my work for previous and current Araucanian scholarship, including the important Dillehay construct. I end by outlining the kind of future research further needed to address the issues considered in my study.

8.1 RESEARCH QUESTIONS

The research questions posed in Chapter 4 centered on assessing domestic variability in status, wealth, and economic activities, in order to expose the social and economic processes that may have structured horizontal and vertical differentiation in the Isla Mocha population.

8.1.1 Settlement Patterns and Subsistence

(4 and 5) Was there significant population aggregation on Isla Mocha? If so, did population nucleations function as centers? That is, do these sites exhibit activities or categories, of occupants, not found at other settlements in the research zone, suggesting that the sites functioned as central places? Is there evidence for spatial divisions in status, wealth, or economic focus within population nucleations like P31-1?

Surface collection showed that most El Vergel Complex settlement in my research zone was concentrated in three loose nucleations; the sites P29-1, P31-1, and P5-1. Outside of these concentrations, settlement was very light, ephemeral, and dispersed, likely representing shifting, individual homesteads. Because my surface collections generated so little surface material outside of the three sites, I was not able to compare these population nucleations with non-center or hinterland occupations. Approximately one km separated each site from its neighbor, suggesting the maintenance of a 1 km radius catchment zone, probably used for agriculture. Each of the three sites are roughly 1 km from the coast, and close to, or cut, by a fresh water stream coming from the island's central range. Each was occupied until the AD 1685-87 depopulation. The three sites were of differing sizes (8.6 to 17.7 ha), but resembled each other in several ways, including similar ceramic and lithic assemblages and similar artifact densities on the surface (20 to 30 artifacts per collection point). As I discuss below, the two sites that were subject to excavation each contained relatively high wealth and low wealth residential foci. The lack of marked inter-site differences in wealth and status indicators suggests that each site was relatively autonomous socially and economically. This finding, in turn, suggests that if there indeed was a paramount chief at P31-1, the centralizing effects of this office were very weak.

The sites were not identical. The two sites subject to excavation - P29-1 and P31-1 – differed in aspects of subsistence. Both birds and fish were represented in the faunal assemblages from each site, but birds were represented in significantly higher proportion at P 31-1, while fish were represented in significantly higher proportion at P 29-1. Thirteen different species of fish, small, medium and large, with correspondingly different habitats and fishing strategies, were identified in excavations. All thirteen of these species were represented at P29-1, while only three medium size species were found at P31-1.

Among the crops, quinoa was the most represented species, with high ubiquity values at both sites from at least the 13th century through the depopulation in the late 17th century. In contrast, my analysis showed maize as increasing in production from at least AD1400, and being largely restricted to P31-1 where it had the highest ubiquity values. This situation can perhaps be related to political processes, given the use of maize for making chicha.

I found no functional differences suggestive of a settlement hierarchy or that one the sites served as a central place to the others. Inter-site differences in ceramic tempers suggest that each community was making its own pottery; there was no overarching ceramic distribution system. Thus, from the perspective of my research, the sites give the appearance of being autonomous communities, socially and economically.

Yet the mound complex would have required a sizeable labor pool, particularly if the artificial platform over which the mounds sit turns out to be the size (4.5 ha) that I am proposing. Not domestic occupations were associated with the mound complex. In fact, the mounds are located in an inter-site area between P29-1 and P31-1, enclosed by a spur of the central mountain range, and an ancient landslide. Dating of the paleosol beneath the mounds indicates construction early (AD 900-1100) in the El Vergel Period at Isla Mocha. Unfortunately, the mound that I test excavated contained no archaeological materials or on its surface. This not only made it impossible to discuss the activities that took place at the mounds, but also contrasts with what Dillehay has described for the Puren-Lumaco mounds in which pottery, stone tools, and burials were found. I think it likely that this public architecture would have required a regional labor force to construct. This supposition, and the fact that the mound is not associated with one of the sites, strongly argues that it provided a ceremonial nexus for ideologically integrating an Isla Mocha population. If this were the case, these characteristics speak to a kind of leadership more amenable to group-oriented or corporate formulations, rather than individualizing or network ones (Renfrew 1974; Blanton et al. 1996).

8.1.2 Wealth and Status Differences in the Isla Mocha Population

(3 and 1) Was there evidence for "horizontal differentiation" in the form of economic specializations or emphases? If so, how does this variability relate to status/wealth distinctions?

(2) How important was communal ritual in Isla Mocha social inequality? Were higher status households differentially involved in ritual and feasting activities, or spatially associated with the mounds?

Surface collection and excavations revealed subtle but pervasive wealth differences in the population. My MDS analysis, presented in Chapter 7, showed that at each of the sites excavated (P29-1 and P31-1), a residential locus corresponding to wealthy or high status, and loci representing less wealthy and lower status residents. These high wealth loci were: Unit 31.02.01 at P31-1, and Units 29.01.02 and 29.01.02 Ext SE, at P29-1. As shown in Table 8.1, the assemblages from these units were distinguished by their: (1) high relative proportion (17 - 29%) of the most valuable pottery or High Investment sherds; (2) high relative proportion (over 60%) of the best stone tool material or Fine Grain rock: and (3) high relative proportion of fish and camelid remains. While these two units stood out as the wealthiest in the sample, they were not identical. Judging only by the "Finishing investment" index on ceramics, Unit 31.02.01 scores higher than does the tandem units 29.01.02 and 29.01.02 Ext SE. However, the only exotic lithic raw material (albeit just 6 pieces), were found in the latter context. Analysis also identified several low wealth or status loci, such as Unit 31.02.07 at P31-1, and Units 29.01.03 and 29.01.01 at P29-1. The assemblages from these units contained low proportions of High Investment sherds and high proportions (more than 70%) of the Low Investment sherds, only 33 – 43 % of the Fine Grain lithic material, little in the way of fish remains, and almost no camelid bones.

Table 8.1 Status groups continnum and its different material assemblages

Per level MDS status	**HIGH**		**MEDIUM**		**LOW**					
Per test pit MDS status	High Status		Medium-High		Medium-Low				Low	
Test Pit	31.02.01		"29.01.02 & 29.01.02 Ext SE"		31.02.07		29.01.03		29.01.01	
Depth	100 cm		120 cm		100 cm		60 cm		80 cm	
	#	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Ceramics Total	389	100	557	100	177	100	428	100	106	100
Low Investment	156	40	343	62	**127**	**72**	**330**	**77**	**94**	**89**
Medium Investment	120	31	121	22	25	14	68	16	11	10
High Investment	**112**	**29**	**93**	**17**	25	14	30	7	1	1
Lithics Total*	66	100	184	100	38	100	50	100	9	100
Fine Grain Rocks	**40**	**61**	**115**	**63**	13	34	23	46	3	33
M&CG Rocks	22	33	50	27	**17**	**45**	**17**	**34**	**4**	**44**
Exotic	0	0	**6**	**3**	0	0	0	0	0	0
Animals Total	122	100	563	100	7	100	79	100	2	100
Mammals	47	39	218	39	4	57	67	85	1	50
Camelids	**4**	**3**	**30**	**5**	1	14	0	0	0	0
Birds	**18**	**15**	16	3	1	14	1	1	1	50
Fishes	**57**	**47**	**321**	**57**	1	14	11	14	0	0

* The "Fine Grain Rocks" corresponds to the sum of the Fine Grain Igneous rocks and the Other Fine Grain rocks. The "M&CG Rocks" corresponds to the sum of the Medium-and-Coarse Grain Igneous rocks and the Other Coarse Grain rocks.

Although my hope was to be able to distinguish individual houselots or homesteads in surface artifact patterns, this proved not to be possible, either within the three main sites or in the areas outlying them. Nor, therefore, could I identify individual chiefly or leadership domestic loci. It is very unlikely that my test units 31.02.01 and “29.01.02 & 29.01.02 Ext SE” happened to be placed in middens from the chiefs at the site. Therefore, the differences among these units represent relative wealth/status differences in the population generally, rather than chiefs and commoners. Instead, the work captures a continuum of social differentiation of people, of relatively higher status or lower status, or wealthy versus less wealthy.

Additional insight into the nature of social differentiation can be derived from looking at the domestic assemblages themselves. With the exception of the faunal remains, the assemblages from different units were virtually identical in categories of materials, for example, in terms of stone tool types. The “higher status” or “wealth” loci simply contained more desirable versions of these objects. Therefore, my sample did not provide any evidence for a highly stratified society, or for marked status differences. The inter-assemblage variability in the sample is consistent with moderate wealth differences.

Revealingly, these wealth differences themselves were manifested in quotidian objects. In fact, my surface and excavation assemblages were essentially devoid of the high-value or “prestige” goods that distinguish higher status or wealthy households in many societies: fancy pottery, luxury items of adornment, imported objects, ceremonial items), and imported or exotic materials (for example, semi-precious stones, glass beads, exotic lithic raw material). My sample sizes from the midden deposits were such that if these items had been widely circulating in appreciable quantities, I would expect to have seen them represented.

In sum, I found no evidence of social differentiation based on wealth finance activities (in exchange or craft production spheres), on wealth accumulation, or even on markedly different household activities. In many respects, even the residents contributing to the Units 31.02.01 and “29.01.02 and 29.01.02 Ext SE” were engaged in the same domestic tasks as other residents, only doing it using slightly more valuable items.

Quite surprising, given that Isla Mocha is, after all, an island, was that I found remarkably little imported material. This, despite the many cases in which island chiefs elsewhere in the world dominate exchange, and despite the ethnohistoric accounts highlighting the association of Isla Mocha chiefs and mainland trade. Possibly this trade may have consisted largely in perishable materials, but ethnographic analogy suggests that such trade generally incorporates durable, display items that show the chief’s extra-local connections.

The wealth differences noted above likely also found expression in diet. The camelid remains, almost completely limited to Units 31.02.01 and “29.01.02 & 29.01.02 Ext SE”, could indicate: (1) a form of household wealth differentiation in term of camelid ownership; (2) dietary differences, with these residents eating more meat (a more expensive cuisine); or (3) differential involvement in feasting activity. Camelids were not originally native to the island, so the residents were either able to maintain a local breeding population, or brought them in from the mainland. The *chilihueque* is an ethnohistorically described camelid in Araucania that was either tamed or fully domestic. Because of their scarcity and requirement for ritual sacrifice these animals were of very high value; their ownership a prerogative of high status individuals. Unfortunatelly, my analysis of the fauna did not allow for identification of camelids at the species level, so the variety of camelids present on the island remains an open question.

Another research goal was to identify “horizontal differentiation” in the form of economic specializations either at the site of sub-site (sector and household) levels. My samples contained none of the correlates needed to monitor staple production (grinding stones or hoes), or most craft production (wasters, tools associated with pottery production, weaving and spinning tools such awls or spindle whorls, or the ores and slags associated with metallurgy). Comparison of lithic tool types from the excavation loci provided no indications of differential involvement in stone tool production.

8.1.3 Changes Through Time

(6) Identifying the timing of demographic shifts and changes in domestic activities.

(7) Most reconstructions of Araucanian sociopolitical development highlight the role of European contact in stimulating social stratification and political hierarchy. Is there evidence for this process at Isla Mocha?

The C14 dates from my project, along with those already available for the island, help to set the occupation at P29-1 and P31-1 from roughly the 10th century to the late 17th century. The beginning of the construction of the mounds and platform very likely took place between AD 900 and 1100.

I was not able to assess demographic trends through survey, because the Isla Mocha pottery styles were not temporally sensitive. However, in my excavations, the “Finishing investment Index” revealed a high consistency through time in the proportions of Low, Medium, and High Investment sherds in each test pit. This pattern suggests that the wealth differences described above were present at or near the beginning of the occupation at these two sites, and persisted without great alteration for about 400 years.

At both P31-1 and P29-1, the constitution of the ceramic assemblages point to a marked socioeconomic shift late in the occupational sequence, probably during or after the 15th century, including a significant decrease in the proportion of High Investment sherds. Roughly concomitant was an increase in maize consumption, especially at P31-1. As I argue in Chapter 7, these 15th century changes are consistent with a general "impoverishment" in the population. Given the current dating framework of the sites, the timing of these changes puts them back to at least AD 1400, well before European arrival in AD 1550. And, no European materials at all were found in excavation. This timing indicates that these changes were autochthonous, rather than related to the effects of European contact. However, as noted earlier, the mixing of the uppermost layer of the site by modern agriculture makes it difficult to make definitive statements about the last centuries of occupation at the sites.

8.2 IMPLICATIONS FOR THE DILLEHAY CONSTRUCT AND PREVIOUS SCHOLARSHIP

"Testing" the construct of social organization and political structure that has been laid out by Dillehay was not a goal of my research. As Dillehay was careful to note, there was much variability in Araucanian populations, and his reconstruction is based on the archaeological record of the Puren-Lumaco area, and a synthesis of ethnohistoric and ethnographic observations. Nevertheless, Dillehay himself (2007) extrapolates from his archaeological findings and local ethnohistory to talking about wider and more general principles of Araucanian sociopolitical organization. More germane, the Dillehay construct lucidly highlights a set of processes and relationships as keys to in the prehistoric and early historic dynamics of that area. My goal was to explore how these processes and relationships were manifested in my, Isla Mocha area. If the patterns I observed differed markedly from those in Puren-Lumaco, it would indicate that these processes *need not necessarily have related to one another* in the way Dillehay argues for the Puren-Lumaco area, and thus should not be treated as universally important in explaining Araucanian sociopolitical dynamics.

For starters, Dillehay (2007) and others have argued that Araucanian social inequality was not based on, or expressed in, wealth accumulation, and that leaders were not differentially involved in wealth finance activities. I found no evidence to contradict this, and, overall, the evidence I do have is consist with this observation. Unlike in Puren-Lumaco, I did not find evidence for an association of population nucleation, agricultural intensification, mound building, feasting activities, and the emergence of chiefly power. Population on the island was nucleated to begin with, suggesting somewhat different settlement dynamics than in the Puren-Lumaco region.

One argument that can be raised is that Isla Mocha represents a “backwater,” a small and isolated marginal population, unlikely to have developed the levels of complexity seen in larger populations at the center of the Araucanian world, such as Purén-Lumaco. This is a plausible interpretation of the lack of significant socioeconomic differentiation at Isla Mocha. Working against this argument is the existence of a significant amount of public architecture (the mounds and platform), and the size of the island’s population.

In order to evaluate this argument, we can compare figures for Purén-Lumaco and Isla Mocha. I estimated above the area surveyed by Dillehay to be about 250 km^2. However, I place weight on his (Dillehay 2007:311) observation that, “a chiefly patrilineage territory in late pre-Hispanic times was approximately 25 sq km ... and associated with an estimated population of 1,500 to 3,000 people. During the period from 1600 to 1800, the larger patrilineage polity in the valley covered about 150 sq km and probably comprised of about 6,000 to 10,000 people.” These values imply a population density of 60 to 120 people per km^2, using the higher figures, and, using the lower ones, of 40 to 67 people per km^2 (note that these values appear to be incompatible with those presented in Dillehay [2007:305-306]). In contrast Isla Mocha is 50 km^2, or even 25 km^2 if one considers just the inhabitable coastal strip and excludes the forested central range. In this case, I have estimated a maximum population of 1500 people distributed in those 25 km^2. This means a population density of 60 people per km^2. This will drop to 40 people per km^2 if a more conservative population of 1000 people is considered. From these estimates is clear then that Isla Mocha had a population density within the range of Purén-Lumaco in its lower extreme. However, this is only a part of the story, and it is important to note that the entire Isla Mocha could fit five times into the Purén-Lumaco valley (50 km^2 versus 250 km^2). In turn, Purén-Lumaco population (using a 150 km^2 figure) may have been 4 to 12 times that of Isla Mocha. Viewed in this way, these estimates lead to consideration of the scale of regional population, and the potential for constituent groups in these populations to interact with others in order to constitute larger socio-political aggregates

The two research areas can also be compared in terms of mounds. According to Dillehay, in Purén-Lumaco there are/were about 300 mounds, or 1.2 mounds per km^2. In contrast, on Isla Mocha, there are only two known mounds, or 0.08 mounds per km^2. Can this difference be taken as a direct reflecting of the size of the mound-using population, or of the social integration achieved by the population of each area? Or does it mean that mound-building was part of different patterns of social interaction for these two populations?

Another key difference between Purén-Lumaco and Isla Mocha is, of course, that the latter is an island. Islands have historically played an important role in the formulation of anthropological constructs of sociopolitical complexity and its categorization, going back to Service and Sahlins work on big-man and chiefly societies, and even earlier. Part of the anthropological attraction to islands was that they were seen as comparative "social laboratories," in which one could more easily segregate variables in order to understand particular social arrangements. This was exemplified by Kirch (1984) in his comparative study on the "Evolution of the Polynesian Chiefdoms". In this study he advanced the hypothesis of an "Ancestral Polynesian Society", whose pre-existing social hierarchies evolved in different ways in different types of Polynesian islands. Therefore, the Isla Mocha population, whatever its original social configuration, may have taken a different trajectory from mainland populations. Balancing this however, is an alternative possibility which is that Isla Mocha may have been socially and politically part of larger, as yet unknown polities or systems on the adjacent mainland. Broodbank (2002:110) has underscored that using the island as the unit of analysis, as it has been usual in island archaeology studies, is misleading.

As I discussed in Chapter 2, another construct of Araucananian sociopolitical organization can be drawn from Boccara's discussion of the nested organizational hierarchy (*ruca*-caserío-*quiñelob*-*lebo*-*ayllarehue*-*futamapu*). Again, I am not testing his model, or trying to adjust my results to his model, but rather evaluating the relative relation of these social units against the scale of the Isla Mocha population.

I was not able to identify specific domestic units (*ruca*), but the different refuse areas uncovered speak of them. Certainly the three concentrations of settlement or sites in my research area can be considered equivalent to what Boccara called the *caserío*, given their distance (1km) from one another, and basis as a community on daily face-to-face interaction.
Above this level, Boccara proposes the *quiñelob*, as the first autonomous, supralocal, political entity, with a population in the hundreds, being the level at which the people get married, perform collective productive activities, funerary rituals, and the defense of the territory. Boccara does not provide hints about how the *quiñelob* was politically integrated. Given these characteristics, my research zone probably corresponds to Boccara's *quiñelob* organizational level. As I suggested above, the island's mounds and platform likely reflected a supra

-community level construction effort, and the plaza created was easily capable of holding the residents of all three sites. Additionally, my estimate for this *quiñelob* level as ranging in the hundreds of people is compatible with my Isla Mocha population estimates.

In comparing archaeological and ethnohistoric pictures of social structure on Isla Mocha requires, we must acknowledge the limitations of each picture, and recognize that we are generalizing from fragmentary perspectives in each case. My archaeological research encountered no chiefs or leaders, which is not to say that they did not exist. It is clear from the early ethnohistoric sources that there was a chief (or a position of leadership the European observers interpreted as such), and that this chiefly position was by most accounts hereditary. While P 31-1 may indeed be the cacique site identified in ethnohistoric accounts, I found no archaeological evidence for this function. On the other hand, if native leadership in Isla Mocha was not accompanied by marked wealth accumulation and political centralization, such leadership may be very difficult to see archaeologically.

What my work did reveal was vertical social differentiation in the Isla Mocha population, in the form of pervasive wealth differences. In fact, if these differences were not pervasive, or a general characteristic of the Isla Mocha population, I probably would not have encountered them with a sample of just 17 test pits. This is a type of social differentiation that is not hinted at in the reconstructions of Dillehay, whose structure of social hierarchy distinguish chiefs from commoners, but provides no discussion of wealth differences among commoners, or social ranking outside of the chiefly class.

The evidence I uncovered for this previously unknown axis of wealth differentiation (as modest as it was) means that Araucanian sociopolitical organization may have been more complex (but in different ways) than in the Dillehay and other ethnohistoric models. My ceramic investment analysis showed that, level through level, a persistence of wealth levels in each unit through time. For example, the residents contributing to the assemblages of Unit 31.02.01 were “high wealth” for a period of some 400 years. The retention of this wealth level over such a long time span suggests some degree of inheritance of (non-chiefly) social positions at Isla Mocha. Such a case does not fit comfortably in simple dichotomous models of achieved vs ascribed (chiefly) societies. If we extrapolate from Isla Mocha, there may have been more dimensions of vertical differentiation in Araucanian society than the hierarchy of chiefs; a finding consistent with the variety of political, military, and religious figures identified by Boccara in the early ethnohistoric accounts.

8.3 FUTURE RESEARCH ON PREHISPANIC ARAUCANIAN SOCIOPOLITICAL ORGANIZATION

One of the obvious, but most valuable, next steps to understanding sociopolitical organization on Isla Mocha is to place this research into a larger regional context. Doing so could entail survey of the entire island, but should also involve research on the adjacent mainland, particularly at Tirúa and Paicaví to provide a comparative perspective. Such research would help answer the questions raised above concerning the extent to which my Isla Mocha results can be viewed in a normative sense, as revealing of Araucanian society generally, or as a picture of the development of a small, marginal, isolated population.

A second valuable line of research would be a refined re-survey of the areas between the three sites. My survey showed a small, dispersed population, but different methodologies could be incorporated into a new survey to produce better information on the density of settlement in these areas, and to generate larger artifact assemblages for comparison with those from the three sites.

Ultimately, the issues raised by the Isla Mocha research require comparative understanding, and this must come from roughly similar investigative priorities guiding research on the mainland. Only then, will it be possible to compare social trajectories, and untangle the factors guiding the variability in Araucania noted by Dillehay and other scholars. A perfect area for comparative study might be that of Angol. According to Dillehay (2007:37) this area does not present mounds at all, but is recognized by him (2007:93, 344) as an important native “political core” into historical times. Additionally, it is one of the most fertile agricultural zones in Southern Chile, and the work done by Bullock (1995, 1970) has set a good comparative baseline. If political centralization, powerful chiefs, and wealth-based social stratification developed anywhere in Araucania, Angol may have been one of those the areas.

APPENDIX A

CERAMICS

Three independent studies have been made of Isla Mocha ceramics. The first of these, by Adán (1997), using material from the P31-1 site, combined surface and temper attributes in classifying 1976 sherds, and distinguishing 18 ceramic types (Table A.1).

Table A.1 Isla Mocha ceramic types, since Adán (1997)

Paste	Type	# total	% total	% total
paste 1 Fine Grain Compact Paste slightly dense in inclusions	Red Slipped Interior-Exterior Group	28	1.42	25.41
	Gray Burnished Interior-Exterior Group	100	5.06	
	Gray Smoothed Interior - Brownish Gray Burnished Exterior Group	95	4.81	
	Reddish Brown Burnished Interior-Exterior Group	134	6.78	
	Brown Smoothed Interior-Exterior Group	145	7.34	
paste 2 Compact Paste, dense in sand granular inclusions	Valdivia Group	5	0.25	60.33
	Red Smoothed Interior - Slipped Exterior Group	54	2.73	
	Orange Coated Burnished Interior – Exterior Group	93	4.71	
	Black Burnished Interior - Orange Coated Burnished Exterior Group	34	1.72	
	Brown Burnished Interior-Exterior Group	174	8.81	
	Brownish Gray Smoothed Interior-Exterior Group	267	13.51	
	Gray Smoothed Interior - Brownish Gray Burnished Exterior Group	124	6.28	
	Reddish Brown Smoothed Interior - Burnished Exterior Group	147	7.44	
	Reddish Brown Burnished Interior-Exterior Group	144	7.29	
	Reddish Brown Smoothed Interior-Exterior Group	150	7.59	
paste 3 Compact Paste, dense in granular inclusions	Brown Smoothed Interior-Exterior Group	247	12.50	12.50
paste 4 Paste with mica	Paste with mica Group	27	1.37	1.37
paste 5 Paste with shells	Paste with shells Group	8	0.40	0.40
		1976	100.00	100.00

A second ceramic study by Sánchez (1997) drew on pottery from five sites, and distinguished 15 ceramic types (Table A.2), while also warning about a, “disproportionate development of sherd typologies”.

Table A.2 Isla Mocha ceramic types, since Sánchez (1997)

Types	P31-1	P5-1	P21-1	P22-1	P25-1	# total	% total
Smoothed	94.22	89.57	91.14	85.71	20.45	8113	75.95
Burnished	1.34	1.88	0.82	3.52	45.34	1223	11.45
Slipped	1.85	2.03	4.40	0.88		194	1.82
Valdivia White	0.17	0.14	0.18		0.33	21	0.20
Negative Painting	0.02	0.07	0.23		0.04	7	0.07
Coated					6.78	165	1.54
Decorated					0.12	3	0.03
Micaceous Paste					0.86	21	0.20
Silteous Paste					0.04	1	0.01
Red Paste					0.41	10	0.09
Eroded		4.93	2.41	9.23	23.16	715	6.69
Unclasificable					2.46	60	0.56
Spaniard	0.02					1	0.01
Others	2.38	1.38	0.53	0.44		142	1.33
Incised		0.07	0.29			6	0.06
	4708	1380	1704	455	2435	10682	100.00

The third ceramic study by Donoso (2010), focused on P21-1’s El Vergel and Transición levels, and used 1825 sherds. For these levels, Donoso described 25 ceramic types (Table A.3).

Table A.3 Isla Mocha ceramic types, since Donoso (2010)

Type	Sub-type	# total	% total	% total
Burnished	Brown Burnished Exterior-Interior	284	15.56	37.81
	Orange Burnished Exterior-Interior	222	12.16	
	Brown Burnished – Indeterminable	75	4.11	
	Orange Burnished – Indeterminable	56	3.07	
	Gray Burnished Exterior-Interior	29	1.59	
	Black Burnished Exterior-Interior	24	1.32	
Smoothed	Orange Smoothed Exterior-Interior	191	10.47	25.32
	Brown Smoothed Exterior-Interior	178	9.75	
	Gray Smoothed Exterior-Interior	33	1.81	
	Orange Smoothed – Indeterminable	33	1.81	
	Brown Smoothed – Indeterminable	27	1.48	
Burnished Exterior – Interior Smoothed	Brown Burnished Exterior – Brown Smoothed Interior	207	11.34	22.08
	Orange Burnished Exterior – Orange Smoothed Interior	196	10.74	
Slipped	Red Slipped Exterior-Interior	63	3.45	6.85
	Red Slipped – Indeterminable	28	1.53	
	Red Slipped Exterior – Smoothed Interior	17	0.93	
	Red Slipped Exterior – Burnished Interior	17	0.93	
Exterior smoothed – Interior Burnished	Brown Smoothed Exterior – Brown Burnished Interior	56	3.07	5.97
	Orange Smoothed Exterior – Orange Burnished Interior	53	2.90	
Eroded	Indeterminable	27	1.48	1.48
Painted Red over White Slip	Red Painted over White Slip Exterior	2	0.11	0.22
	Red Painted over White Slip Exterior – Indeterminable Exterior	1	0.05	
	Red Painted over White Slip Exterior – White Slipped Interior	1	0.05	
Orange Coated	Orange Coated Exterior – Interior	3	0.16	0.16
Incised	Brown Incised Exterior – Brown Burnished Interior	2	0.11	0.11
		1825	100.00	100.00

APPENDIX B

LITHICS

Jackson's lithic analysis (1997) of five ceramic periods at Isla Mocha (P5-1, P21-1, P22-1, P25-1, and P31-1) distinguished six raw material groups. In order to make these groups comparable to those used in my project, I used the rough correlation outlined in Table B.1.

Table B.1 Lithic raw material correlation between this study and Jackson's (1997)

This study	Jackson (1997)
Fine Grain Igneous rocks	Basalt
Medium-and-Coarse Grain Igneous rocks	Basalt
Quartz	Quartz
Granite	Other rocks
Sandstone	Sandstone
Other Fine Grain rocks	Basalt
Other Coarse Grain rocks	Other rocks
Obsidian	Obsidian
Siliceous rocks	Silex

For P31-1 materials, Jackson presents a more detailed analysis, but unfortunately he does not provide the raw material data for the 174 bifacial pieces; so his original sample of 913 specimens had to be reduced from my purposes to 739 lithics (Table B.2)

Table B.2 Lithic raw materials at P31-1, P5-1, P21-1, P22-1, and P25-1

Raw material	P31-1	P5-1	P21-1	P22-1	P25-1	Average
Basalt	72.4	65.4	89.5	94.6	62.1	76.8
Sandstone	5.3	14.3	3.8	-	13.5	7.4
Quartz	5.1	3.1	1.4	-	5.3	3.0
Obsidian	0.4	0.6	0.4	-	0.7	0.4
Silex	-	0.7	-	-	-	0.1
Other rocks	16.8	15.9	4.9	5.4	17.3	12.1
Total	739	325	647	37	154	

By technological categories (with the 174 bifacial pieces corresponding to knapped lithics), the results by raw material for P31-1 are presented in Table B.3.

Table B.3 Lithic tool categories by raw material at P31-1

Raw material	Polished	Pecked	Knapped
Basalt	63.16	54.50	72.92
Sandstone	21.05		4.94
Quartz			5.36
Obsidian			0.42
Other rocks	15.79	45.50	16.36
Total	19	11	709

The proportions of P31-1 knapped lithics in terms of debitage and “modified pieces” (tools, cores, and knapping tests) by raw material are presented in Table B.4.

Table B.4 Debitage and modified pieces by raw material at P31-1

Raw material	Debitage	%	Modified pieces	%
Basalt	492	73.32	25	65.79
Sandstone	33	4.92	2	5.26
Quartz	37	5.51	1	2.63
Obsidian	2	0.30	1	2.63
Other rocks	107	15.95	9	23.68
N=	671	100.00	38	100.00

APPENDIX C

FAUNAL RESOURCES

As expected, fishes constitute one of the most diverse and ubiquitous animal class in Isla Mocha. For this reason I will provide a short description for each one of species identified so far from archaeological sites on the island (including this research). This information was taken from Fishbase (2011).

- *Aphos porosus* (Banded toadfish): demersal specie, during the spring lay its eggs in intertidal ponds. Max length and weight reported: 28.0 cm and 265 g.
- *Auchenionchus microcirrhis*: demersal specie. Max length reported: 22.0 cm
- *Auchenionchus variolosus*: demersal specie. Max length reported: 18.0 cm
- *Bovichthys chilensis*: demersal specie. Max length reported: 9.4 cm
- *Callorhynchus callorhynchus* (Plownose chimaera): demersal specie. Max length reported: 89.2 cm,common length : 70.0 cm.
- *Cilus gilberti* (Corvina drum): demersal specie. Max length reported: 60.0 cm
- *Genypterus maculatus* (Black cusk-eel): demersal specie. Max length reported: 100.0 cm, common length: 50.0 cm
- *Gobiesox marmoratus*: demersal specie. Max length reported: 8.9 cm
- *Labrisomus philippi*: demersal specie.Max length and weight reported: 35 cm and 635 g
- *Mustelus mento*: demersal specie. Depth range 16-50 m. Max length reported: 130 cm.
- *Pinguipes chilensis*: demersal specie. Depth range up to 100 m. Max length and weight reported: 50.0 cm and 1.574 g
- *Sebastes capensis* (Cape redfish): demersal specie. Depth range 20 - 275 m. Max length reported: 37.0 cm, common length: 30.0 cm
- *Sicyases sanguineus*: demersal specie. Max length reported: 8.4 cm

- *Thyrsites atun* (Snoek): benthopelagic and oceanodromous specie, form schools. Depth range 0 - 550 m, although usually 100 - 500 m. Max length reported: 200 cm, common length: 75.0 cm; max. weight: 6,000 g
- *Trachurus symmetricus* (Chilean jack mackerel): Pelagic-oceanic and oceanodromous species, form schools. Depth range 10 - 306 m, although usually 10 - 70 m. Max length: 70.0 cm, common length: 45.0 cm.

Table C.1 compiles the Isla Mocha faunal information. For the birds and fish I have considered only those that have been reported from archaeological sites. The columns headed by capital letters correspond to the different studies considered:

A: this project zooarchaeological analysis

B: previous zooarchaeological analysis carried for the Archaic period sites P27-1 and P30-1 (Becker 1997b; Quiroz 2003b; Quiroz and Sánchez 1993, 2004; Vásquez 1997)

C: previous zooarchaeological analysis carried for the Ceramic period sites P5-1, P21-1, P25-1, and P31-1 (Becker 1997a, 1997b; Quiroz 2003b; Quiroz and Sánchez 2005; Saavedra et al. 2003; Sánchez 1997; Sánchez et al. 2004)

D: the ethnohistoric record (Burney 1816; Fletcher 1854; Hawkins 1847; IJzerman 1926; Ovalle 1646; Roggeveen 1970; Rosales 1877; Speilbergen 1906; Wafer 1903)

E: zoological catalogue (Reiche 1903).

F: biogeographic study (Pefaur and Yáñez 1980)

G: *Octodon pacificus* article (Hutterer 1994)

H: the post-1850 historical record (Quiroz 1997. Personal observations).

Table C.1 Isla Mocha fauna

Class	Order	Family	Specie	A	B	C	D	E	F	G	H	Chilean name	English name
Amphibian	Anura	Leptodactylidae	*Batrachyla taeniata*						?			Sapito de antifaz	Banded Wood Frog
Amphibian	Anura	Leptodactylidae	*Eupsophus insularis*					X	X			Sapo de la Isla Mocha	Mocha Island Ground Frog
Amphibian	Anura	Leptodactylidae	*Pleurodema thaul*						?			Sapito de cuatro ojos	Chilean Four-eyed Frog
Amphibian	Anura	Rhinodermatidae	*Rhinoderma darwinii*						?			Ranita de Darwin	Darwin's Frog
Aves	Indeterminate.			X			X	X				Aves	Birds
Aves	Anseriformes	Anatidae	*Anas* sp.			X						Patos	Ducks
Aves	Charadriiformes	Haematopodidae	*Haematopus* sp.	X								Ostreros	Oystercatchers
Aves	Charadriiformes	Laridae	*Larus* sp.			X						Gaviotas	Gulls
Aves	Ciconiiformes	Spheniscidae	*Spheniscus humboldti*	?		X						Pingüino de Humboldt	Humboldt Penguin
Aves	Falconiformes				X							Rapaces	Raptors
Aves	Galliformes	Phasianidae	*Gallus gallus*				X				X	Gallina	Domestic chicken
Aves	Pelecaniformes	Pelecanidae	*Pelecanus thagus*			X						Pelícano peruano	Peruvian pelican
Aves	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax* sp.	X		X						Cormoranes	Cormorants
Aves	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax atriceps*			X						Cormorán imperial	Imperial shag
Aves	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax boungainvilii*			X						Cormorán Guanay	Guanay Cormorant
Aves	Pelecaniformes	Phalacrocoracidae	*Phalacrocorax brasilianus*			X						Pato yeco, Cormorán negro	Olivaceous Cormorant
Aves	Procellariiformes	Diomedeidae	*Thalassarche* sp.			X						Albatros	Albatrosses
Aves	Procellariiformes	Procellariidae	*Puffinus creatopus*			X		X			X	Fardela Blanca	Pink-footed Shearwater
Chondrichthyes	Indeterminate.			X		X						Peces cartilaginosos	Cartilaginous fishes
Chondrichthyes	Carcharhiniformes	Triakidae	*Mustelus mento*			X						Tollo	Speckled smooth-hound
Chondrichthyes	Chimaeriformes	Callorhinchidae	*Callorhynchus callorhynchus*	X			?					Pejegallo	Plownose chimaera

Table C.1 (continued)

Class	Order	Family	Specie	A	B	C	D	E	F	G	H	Chilean name	English name
Mammalia	Indeterminate.			X								Mamíferos	Mammals
Mammalia	Artiodactyla	Indeterminate.		X								Artiodáctilos	Even-toed ungulates
Mammalia	Artiodactyla	Bovidae	*Bos taurus*	X			X	X			X	Vaca	Domestic cattle
Mammalia	Artiodactyla	Bovidae	Ovis-Capra	X			?					Oveja/Cabra	Sheep/Goat
Mammalia	Artiodactyla	Bovidae	*Ovis aries*				X	X			X	Oveja	Domestic Sheep
Mammalia	Artiodactyla	Camelidae		X			X					Camélidos	Camelids
Mammalia	Artiodactyla	Camelidae	*Lama guanicoe*			X						Guanaco	Guanaco
Mammalia	Artiodactyla	Cervidae	*Pudu pudu*		X	X						Pudu	Pudu
Mammalia	Artiodactyla	Suidae	*Sus scrofa*	X				X			X	Domestic pig	Cerdo
Mammalia	Carnivora	Indeterminate.		X								Carnívoros	Carnivores
Mammalia	Carnivora	Canidae	*Cannis lupus familiaris*					X				Perro	Domestic dog
Mammalia	Carnivora	Canidae	*Lycalopex* sp.			X						Zorros	Foxes
Mammalia	Carnivora	Canidae	*Lycalopex griseus*			X						Zorro chilla	South American Gray Fox
Mammalia	Carnivora	Felidae	*Felis catus*								X	Gato doméstico	Domestic Cat
Mammalia	Carnivora	Felidae	*Oncifelis* sp.			X						Gatos Salvajes	Wild cats
Mammalia	Carnivora	Mustelidae				X						Mustélidos	Mustelids
Mammalia	Carnivora	Mustelidae	*Galictis* sp.			X						Grisones	Grisons
Mammalia	Carnivora	Otariidae				X						Otaríidos	Otariids
Mammalia	Carnivora	Otariidae	*Otaria flavescens*	?	X	X						Lobo marino	South American Sea Lion
Mammalia	Carnivora	Phocidae	*Leptonychotes weddellii*					X				Foca de Weddell	Weddell seal
Mammalia	Cetacea	Indeterminate.		X	X	X		X				Cetáceos	Cetaceans
Mammalia	Perissodactyla	Equidae	*Equus* sp	X								Equinos	Equines
Mammalia	Perissodactyla	Equidae	*Equus ferus caballus*				X	X			X	Caballo	Domestic horse
Mammalia	Rodentia	Indeterminate.		X	X			X				Roedores	Rodents
Mammalia	Rodentia	Cricetidae	*Akodon longipilis*						X	X		Ratón de pelo largo	Long-haired grass mouse
Mammalia	Rodentia	Cricetidae	*Akodon olivaceus*						X	X		Ratón oliváceo	Olive grass mouse
Mammalia	Rodentia	Cricetidae	*Geoxus valdivianus*							X		Ratón topo valdiviano	Long-clawed mole mouse

Table C.1 (continued)

Class	Order	Family	Specie	A	B	C	D	E	F	G	H	Chilean name	English name
Mammalia	Rodentia	Cricetidae	*Oligoryzomys longicaudatus*			X				X		Ratón de cola larga	Long-tailed pygmy rice rat
Mammalia	Rodentia	Muridae				X						Múridos	Murids
Mammalia	Rodentia	Muridae	*Rattus norvegicus*						X			Rata Gris, Guarén	Brown rat, Common rat
Mammalia	Rodentia	Muridae	*Rattus rattus*						X			Rata negra	Black Rat
Mammalia	Rodentia	Myocastoridae	*Myoscastor coypus*		X							Coipo	Nutria
Mammalia	Rodentia	Octodontidae				X						Octodóntidós	Octodontids
Mammalia	Rodentia	Octodontidae	*Octodon pacíficus*	X						X		Degu pacífico, Degu de Isla Mocha	Pacific degu
Osteichthyes	Indeterminate.			X			X					Peces óseos	Bony fishes
Osteichthyes	Batrachoidiformes	Batrachoididae	*Aphos porosus*	X		X						Bagre	Banded toadfish
Osteichthyes	Batrachoidiformes	Scorpaenidae	*Sebastes capensis*	X		X						Cabrilla española	Cape redfish
Osteichthyes	Gobiesociformes	Gobiesociedae	*Gobiesox marmoratus*	X								Pejesapo veteado	
Osteichthyes	Gobiesociformes	Gobiesociedae	*Sicyases sanguineus*	X		X						Pejesapo	
Osteichthyes	Ophidiiformes	Ophidiidae	*Genypterus* sp			X						Congrios	Cusk-eels
Osteichthyes	Ophidiiformes	Ophidiidae	*Genypterus maculatus*	X								Congrio negro	Black cusk-eel
Osteichthyes	Perciformes	Bovichthyidae	*Bovichthys chilensis*	X								Torito	
Osteichthyes	Perciformes	Carangidae	*Trachurus symmetricus*	X		X						Jurel	Chilean jack mackerel
Osteichthyes	Perciformes	Gempylidae	*Thyrsites atun*	X		X						Sierra	Snoek
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus* sp.			X							
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus microcirrhis*	X									
Osteichthyes	Perciformes	Labrisomidae	*Auchenionchus variolosus*	X		?						Tomollo	
Osteichthyes	Perciformes	Labrisomidae	*Labrisomus philippi*			X						Tomollo	Chalapo clinid
Osteichthyes	Perciformes	Pinguipedidae	*Pinguipes chilensis*	X		X						Rollizo	
Osteichthyes	Perciformes	Sciaenidae	*Cilus gilberti*	X		X					X	Corvina	Corvina drum
Reptilia	Squamata	Colubridae	*Tachymenis peruviana*					X	X			Culebra de cola corta	Short Tail Snake
Reptilia	Squamata	Liolaemidae	*Liolaemus cyanogaster*					X	X			Lagartija valdiviana	Valdivian Lizard

APPENDIX D

PLANT RESOURCES AND AGRICULTURE

In order to understand the uses and interactions of the island native population with the botanical resources available to them, it is necessary to include other sources of information, in addition to the archaeological record. In this way, it is possible to reconstruction more fully the native inhabitant economy, noting species that probably were available but either were not preserved in the archaeological record or are not represented so far in the archaeological samples.

Table D.1 compiles that information. This is not an exhaustive catalogue, because I included only those taxa that have been identified in archaeological or palynological studies or that have a documented ethnohistoric/ethnographic food or economic uses.. The columns headed by capital letters correspond to the different studies considered:

A: this study archaeobotanical analysis

B: previous archaeobotanical analysis carried for P5-1, P25-1, and P31-1 sites (Cardemil and Rojas 1995; Sánchez et al. 2004)

C: palinological study (Le-Quesne et al 1997)

D: the ethnohistoric record (Bibar 1966; Burney 1816; Fletcher 1854; Hakluyt 1904; Hawkins 1847; IJzerman 1926; Rosales 1877, 1991; Spielbergen 1906; Valdivia 1929; Wafer 1903; Wieder 1925).

E: the on-the-field botanical catalogue done by Reiche in 1902 (Reiche 1903).

F: the post-1850 historical record about the species mostly cultivated by the current population (Quiroz 1997, Personal Observations)

In the case of Reiche (1903) -with a catalogue of 287 species- I have included only those taxa that are either present archaeologically or palynologically, or with a documented ethnohistoric/ethnographic food use.

I have also included information on the edible part reported for each one of these taxa. The sources I consulted to obtain this information are indicated in the last column. Still, as I will further show, some of these food plants also had other uses, such as firewood, medicinal, technological. Those sources s were:

1: Ramírez (1989)

2: Rossen and Ramirez (1997)

3: Campos (1998)

4: Rapoport and Ladio (1999)

5: Tacón (2004)

6: Pardo and Pizarro (2005a, 2005b)

7: Productos Forestales no Madereros (2011)

8: Plants For A Future (2011)

Table D.1 Isla Mocha botanical resources

Family	Taxa	A	B	C	D	E	F	Edible part	Chilean name	English name	Sources
Aextoxicaceae	*Aextoxicon punctatum*			X		X			Olivillo		
Aizoaceae	*Tetragonia tetragonioides*					X		Leaves	Espinaca silvestre	New Zealand Spinach	6
Alstroemeriaceae	*Luzuriaga radicans*	X				X		Fruits	Quilineja		4
Amaranthaceae	*Amaranthus* sp.	X									
Amaranthaceae	*Chenopodium album*	X				X		Leaves, flowers, seeds	Chingua	Fat hen	6
Amaranthaceae	*Chenopodium quinoa*	X	X					Seeds, leaves	Quinoa	Quinoa	6
Amaranthaceae	*Chenopodium* sp.	X									
Amaranthaceae			X	X							
Amaryllidaceae	*Allium sativum*						X	Flowers,leaves, root, seed	Ajo	Garlic	
Anacardiaceae	*Lithrea caustica*			X					Litre		
Araliaceae	*Pseudopanax laetevirens*			X		X			Sauco del diablo, Traumen		
Asteraceae	*Dasyphyllum diacanthoides*			X		X			Trevo, Palo Santo		
Asteraceae		X		X		X					
Brassicaceae	*Raphanus sativus*	X						Flowers, leaves, root, seed, seedpod	Rábano	Radish	
Brassicaceae				X	X	X					
Bromeliaceae	*Fascicularia bicolor*					X		Fruit, roots, stalks	Chupalla		1, 2, 4, 5, 6
Caryophyllaceae	*Carpobrothus aequilaterus*					X		Fruit, leaves	Doca	Sea Fig	6, 8
Caryophyllaceae	*Silene gallica*	X				X			Calabacillo	Common Catchfly	
Caryophyllaceae	*Stellaria* sp.	X				X				Stitchwort, Chickweed	
Caryophyllaceae		X		X		X					
Cucurbitaceae	*Cucurbita* sp.				X			Seeds, pulp, sprout, leaves, fruit	Zapallos	Squashes	6, 8
Cunoniaceae	*Eucryphia cordifolia*			X		X		Seeds	Ulmo		2
Cyperaceae	*Cyperus* sp.	X						Leaves, stalks, roots	Cortadera	Sedges	1, 2
Cyperaceae				X		X					
Dennstaedtiaceae	*Histiopteris* sp.			X							
Dennstaedtiaceae	*Hypolepsis poeppigii*			X					Helecho pesebre		
Dryopteridaceae	*Ctenitis* sp.			X							
Durvillaeaceae	*Durvillaea antarctica*					X	X	Stem, holdfast	Cochayuyo	Bull kelp	6
Elaeocarpaceae	*Aristotelia chilensis*	X				X		Fruit	Maqui	Chilean Wineberry	1, 2, 3, 4, 5, 6, 7, 8

Table D.1 (continued)

Family	Taxa	A	B	C	D	E	F	Edible part	Chilean name	English name	Sources
Fabaceae	*Medicago* sp.	X				X			Tréboles	Medick, Burclover	
Fabaceae	*Phaseolus vulgaris*	X			X		X	Grain, sprouts, leaves	Poroto	Bean	6, 8
Fabaceae	*Pisum sativum*						X	Leaves, seed	Arveja	Pea	8
Fabaceae		X				X					
Geraniaceae				X		X					
Gunneraceae	*Gunnera tinctoria*			X		X		Rhizome, stalks,leaves,	Nalca, Pangue	Chilean Gunnera	1, 2, 3, 4, 5, 6, 7, 8
Hydrangeaceae	*Hydrangea serratifolia*			X		X			Canelilla, Voqui Naranjo		
Juncaceae		X		X		X					
Lauraceae	*Cryptocarya alba*	X						Fruit	Peumo		3, 4, 5, 6, 7
Lauraceae	*Persea lingue*			X		X			Lingue		
Monimiaceae	*Laureliopsis philippiana*			X		X			Tepa, Huahuan		
Monimiaceae	*Peumus boldus*			X		X		Fruit	Boldo		1, 2, 4, 5, 6, 7, 8
Myrtaceae	*Amomyrtus luma*					X		Fruit	Luma		1, 2, 3, 4, 5, 6, 7, 8
Myrtaceae	*Luma apiculata*			X		X		Fruit	Arrayán, Palo Colorado	Shortleaf Stopper	1, 2, 4, 5, 6, 7, 8
Myrtaceae	*Myrceugenya planipes*			X		X		Fruit	Patagua de Valdivia		6
Myrtaceae	*Ugni molinae*	X				X		Fruit	Murtilla, Uñi	Chilean Guava	2, 3, 4, 5, 6, 7, 8
Myrtaceae				X		X					
Nothofagaceae	*Nothofagus dombeyi*			?					Coigüe		
Nothofagaceae	*Nothofagus obliqua*			?					Roble, Coyan		
Onagraceae	*Fuchsia magellanica*			X		X		Fruit	Chilco, Fucsia	Fuchsia	2, 4, 5, 6, 7, 8
Ophioglossaceae	*Ophioglossum* sp.			X					Lenguas de serpiente	Adder's-tongue	
Oxalidaceae	*Oxalis rosea*					X		Leaves, staks, tuber	Vinagrillo, Culle	Sorrel	4, 6
Philesiaceae	*Lapageria rosea*	X						Fruit	Copihue	Chilean Bellflower	3, 4, 5, 6, 7, 8
Poaceae	*Avena* sp.						X	Seed	Avena	Oats	8
Poaceae	*Bromus* sp.	X				X					
Poaceae	*Chusquea quila*					X		Stalks, leaves, seeds, sprout	Quila		1, 2, 4, 6, 8
Poaceae	*Hordeum vulgare*				X		X	Seed	Cebada	Barley	8
Poaceae	*Triticum aestivum*	X			X		X	Seed	Trigo	Wheat	8
Poaceae	*Zea mays*	X	X		X		X	Seed, stem	Maíz, Choclo	Corn	6, 8
Poaceae		X	X	X		X					

Table D.1 (continued)

Family	Taxa	A	B	C	D	E	F	Edible part	Chilean name	English name	Sources
Podocarpaceae	*Podocarpus nubigena*			X				Fruit	Mañío Macho	Chilean Podocarp	8
Polygonaceae	*Muehlenbeckia hastulata*	X						Leaves, seeds, fruit	Quilo, Voqui Negro		4, 6, 7
Polygonaceae	*Rumex acetosella*			?		X		Leaves, root, seed	Vinagrillo	Sheep Sorrel	8
Polypodiaceae	*Polypodium feullei*			X		X			Calahuala		
Polygonaceae		X	X			X					
Portulacaceae	*Portulaca oleracea*	X						Leaves, seed	Verdolaga	Little hogweed	8
Proteaceae	*Gevuina avellana*	X				X		Seed (nut)	Avellano Chileno, Guevin	Chilean Hazel	2, 3, 4, 5, 6, 7, 8
Rosaceae	*Fragaria chiloensis*	X				X		Fruit	Frutilla Silvestre	Chilean Strawberry	3, 4, 5, 6, 7, 8
Rosaceae	*Margyricarpus pinnatus*					X		Fruit	Hierba de la perlilla	Pearl Berry	4, 6, 7, 8
Rosaceae	*Rubus* sp.	X						Fruit	Miñe-miñe	Berry	1, 2, 3, 4, 5, 6, 7, 8
Rosaceae		X				X					
Salicaceae	*Azara* sp.			X		X					
Santalaceae	*Lepidoceras kingii*			X					Chuichín		
Saxifragaceae	*Ribes punctatum*					X		Fruit	Parrilla		5, 6, 7, 8
Solanaceae	*Solanum tuberosum*		X		X	X	X	Tuber	Papa	Potatoe	2, 6, 8
Solanaceae		X	X			X					
Thymelaeceae	*Ovidia pillopillo*			X		X			Pillo-pillo		
Typhaceae	*Typha angustifolia*	X				X		Rhizome, stalks, sprouts, flowers, leaves, seed	Totora, Batro	Narrowleaf Cattail	4, 6, 8
Ulvaceae	*Ulva latissima*					X	X		Luche	Sea lettuce	
Umbelliferae	*Apium austral*					X		Leaves, roots, seed.	Apio silvestre	Wild celery	4, 6, 8
Umbelliferae				X		X					
Vitaceae	*Cissus striata*	X				X		Seeds	Voqui Colorado		1
Winteraceae	*Drimys winteri*	X				X		Fruit, seeds	Canelo, Foye	Winter's Bark	1

I have also sorted these taxa into six groups based on their botanical characteristics, followed by their origin (native to Southern Chile or exotic). For this task, I consulted several refererereferences (Campos 1998; Chilebosque 2011; Chileflora 2011; Enciclopedia de la Flora Chilena 2011; Plants For A Future 2011; Pardo and Pizarro 2005a, 2005b; Ramirez 1989; Rapoport and Ladio 1999; Rossen and Ramirez 1997; Smith-Ramirez et al. 2005; Tacón 2004; United States Department of Agriculture, Plants Database 2011).

Exotic crops (at least, post-AD 1550, although they could even be post-AD 1850) (7):

- *Allium sativum*
- *Avena* sp.
- *Chenopodium album*
- *Hordeum vulgare*
- *Pisum sativum*
- *Raphanus sativus*
- *Triticum aestivum*

The chronicles (pre-AD 1687) only mention wheat and barley. Note that "fat hen" (*Chenopodium album*) could be just a weed and not a proper crop.

Native (pre-16th century) crops (6):

- *Chenopodium quinoa*
- *Cucurbita* sp.
- *Oxalis rosea*
- *Phaseolus vulgaris*
- *Solanum tuberosum*
- *Zea mays*

All of these but *Cucurbita* sp. and *Oxalis rosea* have been reported in archaeological studies. On the other hand, *Chenopodium quinoa* and *Oxalis rosea* are not mentioned in the chronicles.

Fruit- or edible seed-bearing trees (9):

- *Amomyrtus luma*
- *Cryptocarya alba*
- *Drimys winteri*
- *Eucryphia cordifolia*

- *Gevuina avellana*
- *Luma apiculata*
- *Myrceugenya planipes*
- *Persea lingue*
- *Peumus boldus*

Fruit-bearing shrubs (6):

- *Aristotelia chilensis*
- *Fuchsia magellanica*
- *Margyricarpus pinnatus*
- *Muehlenbeckia hastulata*
- *Ribes punctatum*
- *Ugni molinae*

Herbs with edible fruits, leaves, or stalks (9):

- *Apium australe*
- *Carpobrotus aequilaterus*
- *Chusquea quila*
- *Cyperus* sp.
- *Fragaria chiloensis*
- *Gunnera tinctoria*
- *Rubus* sp.
- *Tetragonia tetragonioides*
- *Typha angustifolia*

Creepers and epiphytes with edible fruits or seeds (4):

- *Cissus striata*
- *Fascicularia bicolor*
- *Lapageria rosea*
- *Luzuriaga radicans*

Edible algae (2):

- *Durvillaea antarctica*
- *Ulva latissima*

Trees with no edible parts (7):

- *Aextoxicon punctatum*
- *Lithrea caustica*
- *Dasyphyllum diacanthoides*
- *Laureliopsis philippiana*
- *Nothofagus dombeyi*
- *Nothofagus obliqua*
- *Podocarpus nubigena*

Shrubs with no edible parts (3):

- *Azara* sp.
- *Ovidia pillopillo*
- *Pseudopanax laetevirens*

Herbs with no edible parts (1):

- *Rumex acetosella*

Creepers and epiphytes with no edible parts (1):

- *Hydrangea serratifolia*

Ferns with no edible parts (6):

- *Ctenitis* sp.
- *Histiopteris* sp.
- *Hypolepsis poeppigii*
- *Lepidoceras kingii*
- *Ophioglossum* sp.
- *Polypodium feullei*

No fungii of edible or economic use was reported, and therefore none was included in this catalogue.

The taxa identified just at the family level are: Amaranthaceae, Asteraceae, Brassicaceae, Caryophyllaceae, Cyperaceae, Fabaceae, Geraniaceae, Juncaceae, Myrtaceae, Poaceae, Polygonaceae, Rosaceae, Solanaceae, and Umbelliferae.

Most of the above trees, shrubs, herbs, creepers and epiphytes, ferns, and algae mentioned are at least endemic species to at least Southern Chile. To determine their distribution and antiquity on Isla Mocha demands study well beyond the scope of my research. Concerning those with a foodstuff use, most of them (21 out of 29), are present either in the archaeological and/or palinological samples. For those 8 remaining species, preservation factors can be perfectly argued to explain its absence.

The *Rubus* genus only has two native species in Chile: *Rubus geoides* and *Rubus radicans*. Therefore, the specimens of this genus in prehispanic contexts must be one or both of these species. On the other hand, it is suggestive that *Cryptocarya alba*, *Lapageria rosea*, and *Muehlenbeckia hastulata*, so far, have been identified only in the archaeological samples, being absent from Isla Mocha today.

Amaranthus sp., *Bromus* sp., *Chenopodium* sp., and *Stellaria* sp., correspond to large genera that included species exotic and also native to Southern Chile. At least, in the case of *Bromus*, there were three native species that had economic importance for the native population of Southern Chile as cultivated cereals: *Bromus bertorianus* (teca), *Bromus catharticus* (lanco), and *Bromus mango* (mango). The last one is today an extinct species.

On the other hand, *Medicago* sp., *Portulaca oleracea*, and *Silene gallica* are of Old World origin. Therefore their presence in Southern Chile can not be earlier than the 16th century.

Finally, the Amaranthaceae, Asteraceae, Brassicaceae, Caryophyllaceae, Cyperaceae, Fabaceae, Geraniaceae, Juncaceae, Myrtaceae, Poaceae, Polygonaceae, Rosaceae, Solanaceae, and Umbelliferae families are so large taxonomically that no further information is worth compiling for their archaeological presence in Chile. Each of these 14 families have many native species in southern Chile.

An important native use of plants was for beverages, of chicha production. The species that ethnohistoric and/or ethnographically were used for this are:

- *Amomyrtus luma*
- *Aristotelia chilensis*
- *Chenopodium quinoa*
- *Fragaria chiloensis*
- *Gevuina avellana*
- *Gunnera tinctoria*
- *Lithraea caustica*
- *Luma apiculata*

- *Muehlenbeckia hastulata*
- *Persea lingue*
- *Peumus boldus*
- *Rubus* sp.
- *Solanum tuberosum*
- *Ugni molinae*
- *Zea mays*

In the case of *Gevuina avellana* and *Gunnera tinctoria* the produced beverage was a non-alcoholic one. That was also the case with *Zea mays*.

Besides, the food use of the different taxa it is also important to consider their possible techno-economic uses. In Table D.2 I have detailed those species with a known techno-economic use. I have included all trees and shrubs in relation to their firewood potential. The sources I consulted were:

1: Mösbach (1992)

2: Ramírez (1989)

3: Rossen and Ramirez (1997)

4: Campos (1998)

5: Tacón (2004)

6: Productos Forestales no Madereros (2011)

7: Plants For A Future (2011)

Table D.2 Isla Mocha botanical techno-economic resources

Specie	Medicinal	Firewood	Dye	Construction	Tannin	Other	Sources
Aextoxicon punctatum		X					1
Amaranthus sp.							
Allium sativum	X					Repellent, adhesive	7
Amomyrtus luma	X	X		X		tools	1, 2
Apium austral						waterproofing	7
Aristotelia chilensis	X	X	X				1, 2, 6, 7
Avena sp.							
Azara sp.	X	X					
Bromus sp.							
Carpobrotus aequilaterus	X					Soil stabilization	1, 7
Chenopodium album	X		X			Soap	7
Chenopodium quinoa	X		X			Repellent, Soap	1, 7
Chenopodium sp.							
Chusquea quila				X		Fodder, tools	2, 6, 7
Cissus striata	X					fiber	1, 2, 6, 7
Cryptocarya alba	X	X	X				6
Ctenitis sp.							
Cucurbita sp.	X					container	7
Cyperus sp.				X			2
Dasyphyllum diacanthoides	X	X					1
Drimys winteri	X	X	X	X			1, 2, 3, 4, 6, 7
Eucryphia cordifolia	X	X			X		1, 4, 6, 7
Fascicularia bicolor							
Fragaria chiloensis	X					Ground cover	1, 7
Fuchsia magellanica	X	X	X			Ground cover, hedge	1, 4, 6, 7
Gevuina avellana	X	X			X		4, 6, 7
Gunnera tinctoria	X	X	X		X	Roofing, glue	1, 2, 4, 5, 6, 7
Histiopteris sp.							
Hordeum vulgare	X						7
Hydrangea serratifolia							
Hypolepsis poeppigii			X				4
Lapageria rosea	X					Fiber	1, 5, 6
Laureliopsis philippiana	X	X					6

Table D.2 (continued)

Specie	Medicinal	Firewood	Dye	Construction	Tannin	Other	Sources
Lepidoceras kingii							
Lithrea caustica		X					
Luma apiculata	X	X	X	X	X		1, 2, 4, 6
Luzuriaga radicans						fiber	1, 4, 5, 6
Margyricarpus pinnatus	X	X					4, 6, 7
Medicago sp.							
Muehlenbeckia hastulata	X	X	X				6
Myrceugenia planipes	X	X					6
Nothofagus dombeyi		X	X				1, 4
Nothofagus obliqua		X	X			Hedge	1, 4, 5, 6, 7
Ophioglossum sp.							
Ovidia pillopillo	X	X	X				1, 5, 6
Oxalis rosea						mordant	1
Persea lingue	X	X	X		X		1, 4, 6
Peumus boldus	X	X	X		X	repellent	1, 2, 3, 4, 5, 6, 7
Phaseolus vulgaris	X		X				7
Pissum sativum	X						7
Podocarpus nubigena		X					7
Polypodium feullei	X						1, 6
Portulaca oleracea	X						7
Pseudopanax laetevirens	X	X					1
Rapahanus sativus	X					Repellent, green manure	7
Ribes punctatum	X	X					1, 5, 6
Rubus sp.			X				7
Rumex acetosella	X		X				1, 7
Silene gallica	X		X				7
Solanum tuberosum	X						1, 7
Stellaria sp.							
Tetragonia tetragonioides							
Triticum aestivum	X						7
Typha angustifolia	X			X		Fiber	1, 5, 6
Ugni molinae	X	X				Hedge	1, 7
Zea mays	X					Adhesive, packing	1, 7

This reveals that many species with a food use can also have a technoeconomic use, and that many species with no edible parts have many possible technoeconomic uses. This information helps to create a more complete image of interaction of the Isla Mocha native inhabitants with the local botanical resources.

Finally in consideration of the rich bothanical information available already outlined, I have also designed a tentative productivity calendar for Isla Mocha. To make this calendar I have only considered those species with edible parts, because this aspect of those species is heavily bounded seasonally (Table D.3).

In contrast, the technoeconomic uses of these species, as well the others included in this category, are less subject to seasonal constraints. In fact, most of them are useful year-round, because they are less likely to depend on plant structures (such as fruit) generatedseasonally.

This productive calendar then will serve to determine possible periods of subsistence stress as well as suggest the likely kinds of strategies to cope with periods of lower productivity. To complement this calendar I have also included the ethnohistoric data that provide information about the resources obtained from the island by different European expeditions in different periods of the year (Table D.4).

There is obviously some risk in proposing a calendar like this, because we do not know the specific cultural practices involved. For example, I do not know if all the available edible species were collected/harvested and consumed or if particular crops were double-cropped.

Still, today's Isla Mocha farmers carried out a non-mechanized agriculture mostly for self-consumption, so therefore their agricultural strategies could be very similar to those implemented by the Isla Mocha native inhabitants.

Given all these considerations, the calendar I am proposing has to be taken as a work-in- progress. The sources I consulted were:

1: Espinosa (1905)

2: Ramirez et al. (1980)

3: Donoso (1989)

4: Ramirez (1989)

5: Elias and Dykeman (1990)

6: Mösbach (1992)

7: Rossen and Ramirez (1997)

8: Lavín and Maureira (2000)

9: Figueroa and Fernández (2001)

10: Jaksic (2001)

11: Tagle and Planella (2002)

12: Gonzalez (2003)

13: Doll et al. (2005)

14: Thomet and Sepulveda (2005)

15: Adasme et al. (2006)

16: Alfonso and Bazile (2009)

17: Jordan (2009)

18: Isla Mocha farmers pers. comm. 2010

19: Enciclopedia de la Flora Chilena (2011)

20: FloraBase, the Western Australian Flora (2011)

Table D.3 Isla Mocha botanical productive calendar

	Winter		Spring			Summer			Fall				Sources
Taxa (by groups)	**Jl**	**Ag**	**S**	**O**	**N**	**D**	**J**	**F**	**Mr**	**Ab**	**My**	**Jn**	
Allium sativum			sowing						harvest				18
***Avena* sp.**								harvest			sowing	sowing	18
Chenopodium album													
Hordeum vulgare			sowing				harvest						18
Pisum sativum			sowing					harvest					18
Raphanus sativus													
Triticum aestivum								harvest			sowing	sowing	18
Chenopodium quinoa			sowing	Sowing	sowing	Sowing	harvest	harvest	harvest				11, 14, 16
***Cucurbita* sp.**				Sowing	sowing			harvest	harvest				12, 18
Oxalis rosea													
Phaseolus vulgaris				Sowing	sowing	Sowing		harvest	harvest				18
Solanum tuberosum			sowing	Sowing						harvest	harvest		18
Zea mays				Sowing	sowing			harvest	harvest	harvest			18
Amomyrtus luma						X	X	X	x	x			1, 4, 7, 19
Cryptocarya alba							X	X	X	X			19
Drimys winteri							X	X	X	X			4, 19
Eucryphia cordifolia	X	X								X	X	X	3
Gevuina avellana							x	X	X	X	X	x	3, 6, 7, 13, 19
Luma apiculata								X	X	X			2, 4, 19
Myrceugenya planipes								X	X	X			2, 19
Persea lingue			X	X	X	X	X	X					19
Peumus boldus						X	X						4, 17

Table D.3 (continued)

	Winter			Spring			Summer			Fall			Sources
Taxa (by groups)	**Jl**	**Ag**	**S**	**O**	**N**	**D**	**J**	**F**	**Mr**	**Ab**	**My**	**Jn**	
Aristotelia chilensis						X	X	X	x				4, 10, 19
Fuchsia magellanica								X	X	x			1, 4, 7
Margyricarpus pinnatus													
Muehlenbeckia hastulata				X	X	X							10
Ribes punctatum													
Ugni molinae								X	X	X			4, 7, 19
Apium australe													
Carpobrothus aequilaterus						X	X	X					20
Chusquea quila	X	X	X	X	X	X	X	X	X	X	X	X	4, 7
***Cyperus* sp.**	x	x	x	X	x	X	X	X	X	X	X	x	4, 7
Fragaria chiloensis			x	X	X	X	x						8, 15
Gunnera tinctoria	x	x	x	X	x	X	X	X	X	x	x	x	4, 7
***Rubus* sp.**						X	X	X	X				19
Tetragonia tetragonioides	X	X	X	X	X	X	X	X	X	X	X	X	19
Typha angustifolia	X	X	x				x	X	X	X	X	X	5
Cissus striata							X	X	X				4
Fascicularia bicolor								X	x	x			4, 7
Lapageria rosea									X	X	X		19
Luzuriaga radicans										X	X		9

Table D.4 Ethnohistoric availabity of botanical resources

Expedition, Year	Winter		Spring			Summer			Fall				Sources
	Jl	Ag	S	O	N	D	J	F	Mr	Ab	My	Jn	
Pastene, 1550				maize, potatoes, beans									Bibar 1966 Valdivia 1929
Drake, 1578					maize, potatoes, rootes, "fruites"								Fletcher 1854
Cavendish, 1587									X				Hakluyt 1904
Hawkins, 1594										"divers sorts of fruits and rootes", “strange kinde of tobacco"			Hawkins 1847
Mahu and De Cordes, 1599					X								Wieder 1925
Van Noort, 1600										maize, potatoes, squash, and other fruits			IJzerman 1926
Van Spielbergen, 1615										Fruit, maize, potatoes*			Van Speilbergen 1906
Rosales, 1674									in March the islanders cross to Tirúa to trade				Rosales 1877, 1991
Swan, 1684									potatoes, maize				Goicovich and Quiroz 2008
Davis, 1686						“Maiz, Wheat, Barly, variety of Fruits, &c”							Wafer 1903
Strong, 1690												X	Burney 1816

Regarding ethnohistoric accounts of Isla Mocha, some comments are necessary. First, I have included all expeditions that passed by Isla Mocha, although not all of them recorded what resources they obtained from the islanders. Those cases are marked with just an X in the corresponding month, but as I will suggest, this “negative” information can also be relevant.

In the case of Van Speilbergen, he indicates only that he obtained “fruit” on the island, and it is Rosales who adds that this expedition also obtained maize and potatoes; I question the veracity of this last piece of information. In addition, Rosales did not visit Isla Mocha, therefore his comments about the production of maize, legumes, wheat, and barley had to have come for other missionaries that did visit the island, or from other sources.

In the calendar I have included for crops the period in which the species is sowed and harvested, and, in the case of non-cultivated species, the period in which the edible part is available. I checked several sources for each resource, sources which were not always in agreement on these periods. For that reason, capital letters indicate months in which most sources agree, and lower case letters, the other months. Indeed these differences are probably reflecting fluctuations in the availability of these resources as detected by different studies. I could not found this category of information for several species (7 out of the 41).

First of all, it is clear, as could be expected, that the winter, and even most of the spring months, are critical months in terms of the absolute amount of non-cultivated resources available. In contrast, the summer is a season rich in them. Summer is also the season for harvesting crops, although for some species this could extend into the fall up to April-May.

It is remarkable that the months in which sowing is required (October-November) coincide in part with the critical period on resources. Therefore, agriculture would seasonally complement wild plant harvesting. Storage would have been an important coping strategy.

A hint of this last practice can be taken from the ethnohistoric information. Unfortunately, there is no specific information concerning the winter months themselves (May to August), because, very probably, navigation was a risky enterprise for Europeans and native inhabitants, and for these months, the island was closed to the outside world.

Into the spring this situation would change, and it is very significant that Pastene, Drake, and Davis obtained, as their account indicate, from the island maize, potatoes, and beans in months were those resources were out of season. In fact, these Europeans arrived from 5 to 7 months after the harvest. This piece of information gives support then to the idea that storage strategies were implemented by the island population.

At the same time, it could be relevant that Pastene and Drake did not have a totally happy experience on the island. Both explorers had struggles with the islanders and suffered crew causalities. To this one can add the Mahu and de Cordes expedition, which lost 27 crewmen in Isla Mocha. Of course, there are many other alternative reasons to explain each one of these outcomes, but still I consider that the evidence is at least suggestive, that their demand for foodstuff in critical months was not happily welcomed by the islanders.

On the other hand, Davis arrived at the end of sowing season, and Cavendish, Hawkins, Van Noort, Van Speilbergen, and Swan during the harvest season. Hawkins, Van Noort, Van Speilbergen, Swan, and Davis besides getting the indicated resources, had an apparently unproblematic experience, at least as their account indicate. In fact, the first three individuals participated at some level with the local community, and in their rituals. Cavendish, in contrast, totally departs from the above experiences, because he did not get any resource and also had a fight with natives.

March is indicated by Rosales as the moment in which the islanders crossed to the mainland to trade. In light of the productive calendar, this is coherent information, as it is at the middle of the harvest season, a period in which both island and mainland communities probably had resources to trade, and there was still good weather to navigate. Finally, Strong arrived to the island when this was already depopulated, and they were unable to get any resources but fresh water.

APPENDIX E

ISLA MOCHA ETNHOHISTORY SOURCES

The following quotes present the corpus of ethnohistorical information concerning Isla Mocha. The date after each name corresponds to the date of account or to its approximate time frame. I have also included quotes that relate to the afterlife connotations that Isla Mocha embodied, most of these are post-depopulation (AD 1687).

- Juan Bautista Pastene (1544)

Relación del viaje de Juan Bautista Pastene desde el 4 hasta el 30 de septiembre de 1544, by Juan de Cardenas

Medina 1896:80

Viérnes 25 días del dicho mes de Septiembre, año susodicho, pasamos con temporal por una isla que está junto á tierra firme, corre un río llamado Toltel-Loubo, y la isla se llama Gueulli, y está en 38 grados largos, que á la ida la descubrimos, día del señor San Nicolás Tolentino, y por esto la nombramos la isla de San Nicolás, y al río llamamos Tórmes, porque pasamos con tormenta por él.

Aquí tomó el dicho tesorero Jerónimo de Alderete posesión desta isla y tierra firme, caciques é indios della. desde la nao, por S. M. y por el dicho señor gobernador Pedro de Valdivia, en su nombre, y pidió á mí, el dicho escribano, se lo diese por testimonio, como me lo tenía pedido en las posesiones pasadas, y á todos los que allí venían rogó le fuesen dello testigos, testigos los sobredichos.

- Juan Bautista Pastene (1550)

Bibar 1966:147-149

En esta sazón mandó el gobernador apercibir ochenta hombres y mandó al general Gerónimo de Alderete que fue con aquella gente y pasase a Nivequetén y a Biobío, y que fuese hasta quince leguas de la ciudad, y que llegas a la cordillera, y que por allí descubriese y fuese hasta donde le pareciese y que, al fin de febrero, volviese a la costa de la mar a la ribera de Biobío porque, para aquel tiempo, saldría él a juntarse allí para ir adelante. Salido el general Gerónimo de Alderete, luego despachó al capitán Juan Bautista con los navíos que fuese a correr la costa y descubriese unas islas, de que tenía noticia, que donde más seguro y sin peligro pudiese tomar comida y cargase aquellos navíos para dejar proveídos aquella gente que había de qudar en sustentación de aquella ciudad. Salió el capitán con los navíos y llegamos a la isla que de antes se había descubierto. Fue avisado del gobernador que no saltase en tierra firme sino que fuese a las islas que él tenía noticia, que estaba delante de aquella otra que había descubierto.

Llegamos a la primera isla, habiendo navegado un día y una noche. Estará esta isla de la ciudad de La Concepción doce leguas y dos leguas de tierra firme. A media noche mandó el capitán hacer a la vela los navíos y fuimos a la tierra firme a la bapi [bahía] donde la otra vez habíamos entrado. Luego el capitán mandó saliesen xl hombres a tierra, pareciéndole que allí se tomaría la comida. Entramos por el valle arriba un cuarto de legua y hallábamos las casas despobladas, que era ya que amanecía. Salieron los indios a nosotros y nos retiramos hacia la mar. Como éramos de a pie, se nos atrevían, que cuando llegamos a la mar donde estaban los navíos era el sol salido, y allí cargó sobre nosotros gran cantidad de gente a estorbarnos la entrada. Por buena maña que nos dimos, aunque no perezosos, nos mataron cinco hombres. Allí delante de nosotros los hacían pedazos y los comían sin que los pudiésemos socorrer, y nos hirieron veinte españoles. Embarcamos con esta ganancia, aunque habíamos salido a tomar comida, mas ellos nos la defendieron muy bien. Ansímesmo nos hicimos a la vela de donde habíamos salido a hacer el salto.

Estuvimos un día y una noche, y otro día salimos para seguir nuestro viaje. Al tercero día vimos la otra isla en la cual tomamos puerto. Esta isla se decía de Amocha: está alta en medio y montuosa y la falda rasa y muy poblada donde se da mucho bastimento. Estará de la otra isla xxx leguas y ocho de tierra firme; tendrá una legua de ancho y dos y media en torno. Hay más de ochocientos indios. Llegados a ella, vinieron muchos indios y mujeres y muchachos espantados de ver aquello que no habían visto, y otro día salimos por la mañana. Luego vinieron los indios y nos mandaron sentar y que no pasásemos adelante, que nos matarían. Mandó el capitán diésemos en ellos y matarónse hasta catorce indios y los demás huyeron y perdiéronse dos señores, los cuales metimos en la galera. Con el servicio que llevábamos, cargamos los navíos de maíz y papas y frísoles, que había gran cantidad. Fue que, en la sazón que llegamos, estaban diferentes dos señores que hay en aquella isla. Por esto no se nos defendió y como ellos en condición general se huelgan del mal, unos y otros no se confedraron, y ansí la tomamos seguramente. Aunque yo he andado y visto hartas provincias, no he visto indios más proveídos de bastimento y de mejores casas que en esta isla, mas no es de maravillar porque es muy fértil tierra.

Hecho este salto, nos hicimos a la vela y nos volvimos a la ciudad. Esta comida se repartió en las personas que habían de quedar en la ciudad. Habló el gobernador [a] aquellos principales indios, y pesole del suceso que nos había acontecido. Tardamos en este viaje treinta días. El gobernador nos tenía por perdidos y aun no tuvo poca alegría cuando nos vido entrar por la bahía. De allí a seis días mandó al capitán Diego Oro fuese con aquellos navíos y llevase aquellos caciques a sus tierras, porque era el principal de la una parcialidad de la isla y el otro era su hijo.

- Pedro de Valdivia (1550)

Carta a sus apoderados en la Corte.

Valdivia 1929:138:

Informar asimismo cómo, desde a tres meses, torné a enviar al dicho capitán e piloto por más comida e a que dixese a los indios de la tierra, enviándoles mensajeros de los que tomase, que viniesen a servir, si no, que los enviaríamos a matar; e navegó veinte leguas más adelante de la primera isla, donde halló otra isla de mas poblazón; y cargando los navíos de maíz, dió la vuelta; e cómo llegó un mes ha.

Carta al Emperador Carlos V.

Valdivia 1929:206:

Dende a cuatro meses torné a enviar al mesmo capitan y piloto con el armada, a que envie mensajeros de los indios que tomase en la isla donde saltó la primera vez que dejó de paz a los caciques de la comarca en tierra firme, donde saltase, y de las islas que topase, diciéndoles que viniesen de paz a donde yo estoi, y si nó enviar a que los maten, e a que trujesen mas comida, que toda era menester; pasó a otra isla, que estaba veinte leguas adelante, donde cargó de comida; era grande y de poblacion: há un mes que volvió: torné a enviar tercera vez el armada diez dias há por mas comida, e a que corran la tierra por aquella costa porque vengan, porque me envian a decir los indios que no quieren venir, pues no imos allá.

- Probanza del bachiller Gonzalo Bazán y su hermano Bartolomé Bazán en el pleito con Francisco de Niebla, sobre los indios del caví Coipuco en Valdivia (1565)

Medina 1899:269:

En la dicha ciudad de Valdivia, á diez días del mes de Septiembre del dicho año de mil é quinientos ó sesenta é cinco años, ante el dicho señor justicia mayor, paresció presento Bartolomé Bazán, é presentó el interrogatorio de preguntas del tenor siguiente:

Por los artículos siguientes sean preguntados los testigos presentados por parte de Bartolomé Bazán, en el pleito con Francisco de Niebla, sobre el artículo cual de los dos fué despojado del caví Coipuco y de sus indios, que el dicho Niebla pretende, por una carta de justicia que ganó con torcida é siniestra relación de los señores de la Real Audiencia de los Reyes.

Medina 1899:272:

12. —Si saben que, habiendo poblado el dicho Gobernador la dicha ciudad de la Concepción, no se podía sustentar, por la gran falta que había de comidas y no poderse traer de parte ninguna, mandó al capitán Bautista que fuese con una galera é navio á la isla de Mocha, con ciertos españoles, á cargar de comida, donde se cargó la dicha galera é navio, [él por estar de guerra la dicha isla de Mocha, se padesció gran trabajo é peligro en el viaje y los naturales della mataron cinco españoles é los demás [estuvieron] apunto de perderse, y en los que así fueron fué uno el dicho Bartolomé Bazán, ó mediante la comida que así se trujo, se sustentó aquella ciudad, que de otra manera no se podía sustentar, é se hizo á S. M. gran servicio; digan lo que saben, etc.

Medina 1899:283:

El dicho Cristóbal de Arévalo, vecino desta ciudad, testigo presentado en esta causa por parte del dicho Bartolomé Bazán, el cual habiendo jurado en forma de derecho é siendo preguntado por el tenor del dicho interrogatorio, dijo é declaró lo siguiente.

Medina 1899:285:

12. —A las doce preguntas, dijo: que lo que della sabe es que, después de poblada la dicha ciudad de la Concebción, tuvieron grande nescesidad de comida, é por falta della, el gobernador Pedro de Valdivia mandó al dicho capitan Juan Baptista que fuese á la isla de la Mocha por comida, ó para ir con él se apercibieron ciertos soldados, entre los cuales se apercibió el dicho Bartolomé Bazán, lo cual sabe porque este testigo, en aquel tiempo, era alguacil del campo, é como tal alguacil, por mandado del dicho Gobernador, apercibió al dicho Bartolomé Bazán para que fuese con el dicho capitán Bautista, y así fué en la didicha galera en acompañamiento del dicho Baptista por la dicha comida, y yendo á la isla de la Mocha con la dicha galera y barco, fué público é notorio saltaron en tierra en la dicha isla é se padesció mucho trabajo é peligro de las vidas á causa destar la tierra de guerra, é trajeron la dicha galera é barco de comida, á cuya causa la dicha ciudad se sustentó, y en ello se hizo gran servicio á S. M., y el dicho Bartolomé Bazán sirvió en ello muy bien á S. M.; y esto sabe desta pregunta é no otra cosa.

Medina 1899:290:

El dicho Gaspar Viera, vecino é regidor desta ciudad, testigo presentado en esta causa por parte del dicho Bartolomé Bazán. el cual, habiendo jurado en forma de derecho, é siendo preguntado por el tenor del dicho interrogatorio é preguntas dél para en que fué presentado, dijo lo siguiente.

Medina 1899:292:

12. —A las doce preguntas, dijo: que lo que della sabe es que, estando el dicho gobernador Valdivia en el dicho asiento de la dicha ciudad de la Concebción, había muy gran falta de comida, y el dicho Gobernador envió á el dicho capitán Baptista con una galera é otro navio á buscar comida á la isla de Mocha, y el dicho capitán Baptista salió en tierra firme, é los dichos naturales dieron en él y en los que con él iban é mataron ciertos españoles y estuvieron á punto de se perder todos, lo cual sabe porque este testigo estaba en el dicho asiento con el dicho gobernador Valdivia, é vido trajeron mucha comida en la dicha galera é navio, á cuya causa se sustentó la dicha ciudad, é que es público é notorio que el dicho Bartolomé Bazán se halló en todo ello, como la pregunta lo dice, en lo cual se hizo gran servicio á S. M.; y esto sabe deste pregunta, etc.

Medina 1899:302:

El dicho Toribio de Cuevas, vecino de esta ciudad, testigo presentado en esta causa por parte del dicho Bartolomé Bazán, el cual habiendo jurado en forma de derecho, é siendo preguntado por el tenor del dicho interrogatorio é preguntas dél para en que fué presentado, dijo é depuso lo siguiente:

Medina 1899:303:

12. —A las doce preguntas, dijo: que sabe que, después de poblada la dicha ciudad de la Concepción, había nescesidad de comida, y el dicho gobernador Valdivia envió al dicho capitán Bautista en la galera que la pregunta dice por comida á la isla de Santa María y á la isla Mocha, y lo demás que pasó en las dichas islas, este testigo no lo sabe, porque no se halló en ello, mas de que fué público é notorio haber muerto en la dicha isla ciertos españoles, é que no se acuerda si el dicho Bartolomé Bazán fué en la galera ó nó; y esto sabe desta pregunta, etc.

- Alonso de Gongora Marmolejo (1575)

Gongora Marmolejo 1862:104

Habiéndosele al capitan cansado el caballo, lo mataron los indios a lanzadas, y con él otros cinco soldados y a Rebolledo que tomaron a prision, que se les rindió, lo vendieron por una oveja, y despues él se libertó como adelante se dirá, estando en poder de un principal en la isla de Mocha; y porque en otra refriega cerca de alli habian muerto a Rodrigo Palos y a Sancho Jufré, hijodalgo de Medina de Rioseco, pesando todas estas cosas, se conformaron en despoblar la ciudad. Todos juntos hombres y mujeres, niños y servicio, que era lástima de ver, llegaron al valle de Arauco ; Villagra los mandó embarcar en el navio que estaba en la playa, y otro dia se embarcó él con dos criados para irse a la Concepcion; y porque Pedro de Villagra habia llegado alli a darle el pésame de la muerte de su hijo, y que era hombre de guerra, le rogó y mandó como a su jeneral se quedase en aquella fuerza con ciento y diez hombres, a los cuales mandó le obedesciesen y hiciesen todo loque les mandase; y porque se entienda quiénes eran, para lo que se ofreciese adelante, quise ponerlos aqui: Pedro de Villagra, Lorenzo Bernal, Gaspar de la Barrera, Francisco Baca, Alonso de Alvarado, Alonso Campofrio, Sancho Medrano, Alonso Chacon Andicano, Agustín de Ahumada, Antonio de Lastur, don Francisco Ponce, Francisco de Godoy, Hernan Perez, Francisco de Arredondo, don Gaspar de Salazar, Francisco Gomez Ronquillo, Pedro Beltran. Gonzalo Perez, Juan de Almonaci, Juan Garces de Bobadilla, Gabriel Gutierrez, Lorenzo Pacho, Juan de Ahumada, Bartolomé Juarez, Juan Salvador, Francisco de Niebla Bahurto, Pero Fernandez de Córdoba, Gomez de Leon, Francisco Lorenzo, Baltazar de Castro, Juan Rieros, don Juan Enriquez, Lope Ruiz de Gamboa, Juan de Córdoba, Cabral Guisado, Juan de la Cueva, Cortes de Ojeda, Gonzalo Fernandez Bermejo, Jacome Pasten, Villalobos: todos los cuales se hallaron en el cerco, defendieron aquella fuerza peleando infinitas veces, como adelante se dirá.

- Francis Drake (1578)

The World Encompassed by Sir Francis Drake.

Fletcher 1854:94-99:

After we were once againe thus fallen with the land, we continually coasted along, til we came to the height of 37 D., or thereabout ; and finding no conuenient place of abode, nor likelihood to heare any newes of our ships, we ranne off againe with an Iland, which lay in sight, named of the Spaniards *Mucho*, by reason of the greatnesse and large circuit thereof.

At this Iland comming to anchor November 25, we found it to be a fruitfull place, and well stored with sundrie sorts of good things : as sheepe and other cattell, maize (which is a kinde of graine whereof they make bread), potatoes, with such other rootes ; besides that, it is thought to be wonderfull rich in gold, and to want no good thing for the vse of mans life. The inhabitants are such Indians, as by the cruell and most extreame dealing of the Spaniards haue beene driuen to flie from the maine here, to releeue and fortifie themselues. With this people, our Generall thought it meet to haue traffique for fresh victuals and water ; and for that cause, the very same night of our arriuall there, himselfe with diuers of his company went ashoare, to whom the people with great courtesie came downe, bringing with them such fruites and other victuals as they had, and two very fat sheepe, which they gaue our Generall for a present. In recompence whereof, hee bestowed vpon them againe many good and necessarie things ; signifying vnto them, that the end of his comming was for no other cause but by way of exchange, to traffique with them for such things as wee needed and they could spare : and in particular, for such as they had alreadie brought downe vnto vs, besides fresh water which wee desired of them. Herein they held themselues well contented, and seemed to be not a little ioyful of our comming, appointing where we should the next morning haue fresh water at pleasure, and withall signifying that then also they would bring us downe such other things as we desired to serue our turnes.

The next day [Nov. 26] therefore, very early in the morning (all things being made readie for traffique, as also vessels prepared to bring the water), our Generall taking great care for so necessarie prouision, repaired to the shoare againe; and setting aland two of his men, sent them with their *Barricoes* to the watering place, assigned the night before. Who hauing peaceably past on one halfe of the way, were then with no small violence set vpon by those traitorous people, and suddenly slaine : and to the end that our Generall with the rest of his company should not onely be stayed from rescuing them, but also might fall (if it were possible) into their hands in like manner, they had layed closely behind the rockes an ambushment of (as we guessed) about 500. men, armed and well appointed for such a mischiefe. Who suddenly attempting their purpose (the rocks being very dangerous for the boate, and the sea-gate exceeding great) by shooting their arrowes hurt and wounded euery one of our men, before they could free themselues, or come to the vse of their weapons to do any good. The General himself was shot in the face, vnder his right eye, and close by his nose, the arrow piercing a maruellous way in vnder *basis cerebri*, with no small danger of his life ; besides that, he was grieuously wounded in the head. The rest, being nine persons in the boate, were deadly wounded in diuers parts of their bodies, if God almost miraculously had not giuen cure to the same. For our chiefe surgeon being dead, and the other absent by the losse of our Vice-Admirall, and hauing none left vs but a boy, whose good will was more then any skill hee had, we were little better then altogether destitute of such cunning and helpes, as so grieuous a state of so many wounded bodies did require. Notwithstanding God, by the good aduice of our Generall, and the diligent putting too of euery mans helpe, did giue such speedy and wonderfull cure, that we had all great comfort thereby, and yeelded God the glory thereof.

The cause of this force and iniurie by these Ilanders, was no other but the deadly hatred which they beare against their cruell enemies the Spaniards, for the bloudy and most tirannous oppression which they had vsed towards them. And therefore with purpose against them (suspecting vs to bee Spaniards indeed, and that the rather by occasion that though command was giuen to the contrary, some of our men in demanding water, vsed the Spanish word Aqua) sought some part of reuenge against vs.

Our Generall, notwithstanding he might haue reuenged this wrong, with little hazard or danger, yet being more desirous to preserue one of his owne men aliue, then to destroy 100 of his enemies, committed the same to God ; wishing this onely punishment to them, that they did but know whom they had wronged ; and that they had done this iniurie, not to an enemie, but to a friend ; not to a Spaniard, but to an Englishman ; who would rather haue beene a patron to defend them, then any way an instrument of the least wrong that should haue beene done vnto them. The weapons which this people vse in their warres, are arrowes of reeds, with heads of stone very brittle and indented, but darts of a great length, headed with iron or bone.

The same day that we receiued this dangerous affront, in the afternoone, we set sayle from thence.

Manuscript Sloane No. 61.

Flecther 1854:93-96:

[In our course from Elisabeth Iland wee kept close aboord the shore, as well of the broken land as the maineland of India, till wee fell in sight of an Island named Mucho ; in the meane tyme wee chanced with an Iland as a stragler from the rest of the Southerly broken land, which wee found nothing inferior for birds and eggs (for the bignes to that wee mett with upon the coast of the land of Giants before mentioned, where, haveing well refreshed ourselves, and taken provision with us, wee proceeded in our way, wee haveing the Iland Mocho in sight, thought best to leave the maine land and not to discover ouerselves : but to runne for that Iland, first, in hopes here to haue some helps and diversions ? for our purpose at the mane. Wee therefore arriveing at Moucho, the Generall with a chosen company rowed to land with our shipp boate, who, no sooner were come, but the inhabitants repared to them with great shew of frendship, and roundly entered into traphick with our men, and that to oure great good likeing ; for their comodityes were such as wee wanted, as fatt muttons, hens, maize, or as comonly its named, Guiney wheat, etc., whereof that night wee had som reasonable tast ; and because wee had need of fresh water, signes being made thereof, they gave us assurance by signes against the next morneing, at the riseing of the sonn, wee should have it at pleasure. That night, our mutton and hens was to us so sweet, that wee longed for day that wee might have more such bargains at their hands, yea every man desired to be a South Sea merchant ; but the captayne, the tyme being come, made such choice as he thought fitt for the action, who together with joy sett forwards to land, as well apointed allmost, but that they had neither bowe nor other shott, as they were in Port Julian when they mett with the Giants, when they slew two of our men ; being therefore well armed with sword and targetts, they feared no perills, nor mayde no doubt but to have as kind entertainment now as the night before, and that infidells were faithfull as Christians ; but they were utterly deceaved, and hadd a redy reward of security and too light credulity ; for no sooner were they com to the place, but Barbary's policy was presently practised against them, yea in manner and sort as wee found it there : for a narrow creek was apointed for them to bring their boat into, on both sydes whereof did grow aboundance of Indian reeds, high and thick, wherein they had couched a multitude of bloody souldiers on both sydes, not one whereof made anny shew, at their comeing in, but lay close till they hadd their opertunity they looked for. Some were apointed to stand at the landing place to receave our men, and colourably to shew them a place where to goe for water, for which purpose two of our men carying vessels with them went one shoare, one whereof took the boats rope with him to draw the boat nearer to land, which don he left it laying one the ground, which no sooner was out of his hand but an Indian tooke it upp, holdeing the boat fast to the shoare by it, which donn, others layed violent hands upon our men which were landed and caried them away. The souldiers hidden in the reeds, well armed with bowes, arrows, and darts, made of canes, and appoynted to the slaughter, sett uppon every syde against them which were in the boats, who being as naked, not either able to defend themselves or anoy their enemyes, were enforced to be butts to every arrow at the pleasure of the shooter behind and before, and one every syde, being so near that they might place their arrows in anny part of their bodyes as they would ; so that though they received now and then an arrow into a targett, yet that did help them but little and was uncertain, because the arrowes came so thick and every way upon them, cribbed up into so narrow a plase as the boat, not one able to stirr by another to help themselves ; so that not anny one person escaped without some greavious wound, and most had many, so that their bodyes were loaden with arrowes from 2 to 3, 4, 5, 8, 10, and one had 21, in the severall partes of their bodyes ; some in head and face, as the General ; some in the throat, breasts, arms, back, belly, and where not : neither had any one of them escaped with life, if one of the simplest of the company had not with his sword cutt the boat's rope, and by that meanes sett them at liberty to help themselves by shifting away. At whose departure, arrowes were sent to them so thick as gnats in the sonn, and the sydes of the boat within and without stuck full of them as almost one could stand by another, so that a man might by sight of the boat a farr off judge what was the state of their bodyes which were in it; who comeing one shipp board, the horror of their bloody state wounded the harts of all men to behold them. Notwithstanding, prayers being made for their comfort, it was endeavoured to ease their extremity, to save them whom the Lord had apointed to live : so that it pleased God not anny but one dyed of that accident. Now in the meane tyme, with what expedition we could, the boate was manned againe, and sent to see if happily anny helpe might be hadd for our men whom the enemy had taken, but all in vain and impossible ; for when our men came in view of them, the multitude was great, by estimation 2000 per well appointed, with bowes, darts, speares, shields, pikes, and other weapons, most of them headed with pure silver, which in the light of the sonn made a wonderfull show and glittering. Among these and many others of the comon people, were our two men in their execution and torments, the manner whereof, as they perceived or conceived at the least, was in this sort : the men being fast bound, were layed upon the ground among them, and the people cast themselves into a ring round about them, hand in hand with a dance, still turneing or going about with a song; in the meantyme tormentors, workeing with knives upon their bodyes, cutt the flesh away by gubbets, and cast it up into the ayer, the which falleing downe, the people catched in their danceing, and like doggs devoured it in most monstrous and unatural manner, even most horrible to nature, and thus continued till they had picked their bones, life yet remaining in them. Our men seeing no good to be donn, after a volly or two of shott bestowed upon them, but could do them no harme because at every offer of a shott they would all fall flat to the ground, they returned againe as men all-amort with so horrible a spectacle of our naturall people. Wee might have taken a revenge upon them at pleasure with great shott out of our shipp, but the Generall would not for speciall causes consent to it. Wee understood that this people were naturall Indians, and did inhabit at mainland ; but by the bloody cruelty of the Spanyards (as were the Brasilians by the Portugalls, as in the story of Brasilia you may reade) were driven to flye from their naturall country to this Iland to purchase to themselves peace and safetey, where, haveing established themselves a kingdom, which they maintaine with continuall shedding of the blood and eateing of the flesh of the Spanyards, when or howsoever they can come by them, as the people of Brasilia deale with the Portugalls when they overcom them ; and because they were never acquainted with anny other nation but the Spanyards in those partes of the world, they perswadeing themselves that wee were the same, and the rather because one of our men rashly spake in the Spanish tongue, they determined to bestow upon us a Spanyard's reward, which they effected indeed to our great griefe and hazardeing of our state ; wherein whether God mett us *jumpe* in the South Sea or noe wee ourselves might easily judg. This Iland is most rich in gold and silver, and it aboundeth in many good things necessary for the maintainance of Gods good people, flourishing with trees and fruit continually, wanting nothing but a people feareing God to injoye it, to glorify his name for such excellent blessings bestowed upon it. I may compare it fitly to Her Majesty's Iland named Weight, upon the coast of England, which in respect of its situation is called Vectis, a doore-barr to the land on that syde of our country, so this Iland layeth in like sort right against a most golden province of the world named Valdinia, which both being possessed by one Prince would make the one and the other invincible ; but of this Valdinia you shall hear more in the second part of this navigation about the world, which I will attempt to finish with all convenient speed I may.]

Anonymous Narrative.

Flecther 1854:178-179:

When Frances Drake had passed y[e] straytes of Magellan, the first land hee fell w[th] was an Iland named Mocha, wher hee came to an anckor, and hoysing out his bote, hee w[th] ten of his company went on shore, thincking ther to have taken in fresh water. Two of the company going far into the Iland were intercepted and cut of by the Indians that inhabite the Iland, who, as sone as the saw our men com to ancker, thought they would come on Iland (as they did indeede), and layd an ambush of about 100. Indians ; and whe our boate was fast on ground and all the men gone on land, the ambush brake out and set upon them, and before they could recover their bote and get her on flote, they hurt all our men very sore with theire arrowes. Their names which went on shore were these foloing: Frances Drake, John Bruer, John Marten, Thomas Flud, Tom Bruer, great Nele a dane, littell Nele a fleming, John Gripe, John Mariner, Gregory Rayment, and Diego a black Moore, w[ch] was Drakes man; of which company ij. namely Tom Brwer and Tom Flud were intercepted by the Indians and there lost, and greate Nele y[e] Dane, their guner, and Diego y[e] black More died of their wonds, the rest escaped their wonds and were cured. They stayed heere but one day, but set sayle toward ye coast of Chile.

The Famous Voyage of Sir Francis Drake into the South Sea, and therehence about the whole Globe of the Earth, began in the yeere of our Lord 1577.

Flecther 1854:238-239:

We continuing our course, fell the 29. of Nouember with an Island called la *Mocha*, where we cast anchor, and our Generall hoysing out our boate, went with ten of our company to shore, where wee found people, whom the cruell and extreme dealings of the Spaniards haue forced for their owne safetie and libertie to flee from the maine, and to fortifie themselues in this Island. We being on land, the people came downe to us to the water side with shew of great courtesie, bringing to us potatoes, rootes, and two very fat sheepe, which our Generall receiued and gaue them other things for them, and had promise to haue water there : but the next day repayring againe to the shore, and sending two men aland with barrels to fill water, the people taking them for Spaniards (to whom they vsed to shew no fauour if they take them) layde violent hands on them, and as we think, slew them.

Our Generall seeing this, stayed here no longer, but wayed anchor, and set sayle towards the coast of Chili, and drawing towards it, we mette neare to the shore an Indian in a canoa, who thinking us to haue bene Spaniards, came to us and tolde us, that at a place called *S. Iago*, there was a great Spanish laden from the kingdome of Peru.

A Discourse on the West Indies and South Sea, written by Lopez Vaz, a Portugal.
Fletcher 1854:286:

But Francis Drake himselfe ranne with this storme into seuen and fifty degrees of Southerly latitude, where hee found an Island with a good harborough and fresh water, and stayed at the same Island two moneths to repayre his ships: and then, the weather beeing faire, he proceeded on his voyage, and came to the coast of *Chili* to an Island called *La Mocha*, where hee went on shore and talked with the Indians: but when hee of would haue returned unto his boate they shotte their arrowes at him, and killed two of his men, and hee himselfe was wounded in the face.

The voyage of Nunno de Silva a Portugal Pilot taken by sir Francis Drake at the yles of Cabo Verde.
Hakluyt 1904:137-138:

The next day they set saile againe, holding their course Northnortheast, and North, to another Island lying five or sixe leagues from the firme land, on the North side of the Streight, where they ankered about a quarter of a league from the land, in twelve fathome water. This Island is small and lowe land, and full of Indians, the Island being altogether possessed and inhabited by them, where they hoysed out their boate, wherein the Admirall and twelve Englishmen entred, going to fetch fresh water, and to seeke for victuals: and being landed upon the Island, the Indians in exchange of other things, brought two Spanish sheepe, and a little Maiz or rootes whereof they make bread, and because it was late, they returned againe unto their ship, without doing any other thing for that day.

The next day the said Captaine with the aforesaid twelve men being harquebusiers, rowed to land againe, and set two of their company on shore with their vessels to fetch fresh water, and by the place where they should fill their water there lay certaine Indians secretly hidden, that fell upon the two Englishmen and tooke them: which they in the boat perceiving, went out to helpe them, but they were so assailed with stones & arrowes, that all or the most part of them were hurt, the Captaine himselfe being wounded with an arrow on the face, and with an other arrow in the head, whereby they were constrained to turne backe againe, without once hurting any of the Indians, and yet they came so neere the boate, that they tooke foure of their oares from them. This done, they set saile againe, running along the coast with a South winde, sailing so for the space of sixe days.

- Thomas Cavendish (1587)

The admirable and prosperous voyage of the Worshipfull Master Thomas Candish, by Francis Petty.

Hakluyt 1904:302:

The 15. of March in the morning the Hugh Gallant came in betweene the Iland of S. Mary and the mayne, where she met with the Admiral and the Content, which had rid at the Iland called La Mocha 2. dayes, which standeth in the Southerly latitude of 38 degrees: at which place some of our men went on shore with the Vice-admirals boate, where the Indians fought with them with their bowes and arrowes, and were marveilous warie of their Calivers. These Indians were enemies to the Spaniards, and belonged to a great place called Arauco, and tooke us for Spaniards, as afterward we learned.

- Richard Hawkins (1594)

Hawkins 1847:144-148:

The 19th of April, being Easter-even, we anchored under the iland Mocha. It lyeth in thirty-nine degrees, it may be some foure leagues over, and is a high mountainous hill, but round about the foote thereof, some halfe league from the sea-shore, it is champion ground, well inhabited, and manured.

From the straites to this iland, we found that either the coast is set out more westerly then it is, or that we had a great current, which put us to the west-wards : for we had not sight of land in three dayes after. Our reckoning was to see it, but for that we coasted not the land I cannot determine, whether it was caused by the current, or lying of the land. But Spaniards which have sayled alongst it, have told me that it is a bold and safe coast, and reasonable sounding off it.

In this iland of Mocha we had communication and contratation with the inhabitants, but with great vigilancie and care; for they and all the people of Chily are mortall enemies to the Spaniards, and held us to be of them; and so esteemed Sir Francis Drake when he was in this iland, which was the first land also that he touched on this coast. They used him with so fine a trechery, that they possessed themselves of all the oares in his boate, saving two, and in striving to get them also, they slew and hurt all his men : himselfe, who had fewest wounds, had three, and two of them in the head. Two of his company which lived long after, had, the one seaventeene (his name was John Bruer, who afterward was pilot with master Candish), and the other above twentie, a negroe-servant to Sir Francis Drake.

And with me they used a pollicie, which amongst barbarous people was not to be imagined, although I wrought sure; for I suffered none to treate with me nor with my people with armes. We were armed, and met upon a rock compassed with water, whether they came to parley and negotiate. Being in communication with the casiques and others, many of the Indians came to the heads of our boates, and some went into them. Certaine of my people standing to defend the boates with their oares, for that there went a bad sege, were forced to lay downe their musketts; which the Indians perceiving, endevoured to fill the barrells with water, taking it out of the sea in the hollow of their hands. By chance casting mine eye aside, I discovered their slynesse, and with a truncheon, which I had in mine hand, gave the Indians three or foure good lamskinnes : the casiques seeing it, began to give me satisfaction, by using rigor towardes those which had beene in the boates; but I having gotten the refreshing I desired, and all I could hope from them, would have no further conversation with them. At our first comming, two of their casiques, who are their lords or kings, came aboord our shippe (we leaving one of our company ashore as a pledge), whom we feasted in good manner; they eat well of all that was set before them, and dranke better of our wine : one of them became a little giddie headed, and marvayled much at our artillery: I caused a peece to be primed, and after to be shott off, whereat the one started, but the other made no shew of alteration. After putting them ashore, loaden with toyes and trifles, which to them seemed great riches; from all parts of the iland the people came unto us, bringing all such things as they had, to wit, sheepe, cockes, etc. (from hennes they would not part), and divers sorts of fruits and rootes, which they exchanged with us for knives, glasses, combes, belles, beades, counters, pinnes, and other trifles. We saw little demonstration of gold or silver amongst them, though some they had; and for that we saw they made estimation of it, we would not make reckoning of it: but they gave us to understand that they had it from the mayne.

The sheepe of this iland are great, good, and fatt; I have not tasted better mutton any where. They were as ours, and doubtlesse of the breed of those which the Spaniards brought into the country. Of the sheepe of the country we could by no meanes procure any one, although we saw of them, and used meanes to have had of them; for they esteem them much, as reason willeth, serving them for many uses; as in another place, God willing, I shall declare more at large. They have small store of fish.

This iland is scituate in the province of Arawca, and is held to be peopled with the most valiant nation in all Chily, though generally the inhabitants of that kingdome are very couragious.

They are clothed after the manner of antiquitie, all of apparell, woollen; their cassocke made like a sacke, square, with two holes for the two armes, and one for the head, all open below, without lining or other art: but of them some are most curiously wooven, and in colours, and on both sides alike.

Their houses are made round, in fashion like unto our pigeon houses, with a laver in the toppe, to evacuate the smoake when they make fire.

They brought us a strange kinde of tobacco, made into little cakes, like pitch, of a bad smell, with holes through the middle, and so laced many upon a string. They presented us also with two Spanish letters, thinking us to be Spaniards, which were written by a captaine of a frigate, that some dayes before had received courtesie at their hands, and signified the same to the governour; wishing that the people of the iland would become good subjects to the king, and that therefore he would receive them into his favour and protection, and send them some person as governour; but none of them spake Spanish, and so we dealt with them by signes. The people of this iland, as of all Chily, are of good stature, and well made, and of better countenance then those Indians which I have seene in many parts. They are of good understanding, and agilitie, and of great strength. Their weapons are bowes and arrowes, and macanas : their bowes short and strong, and their arrowes of a small reede or cane, three quarters of a yard long, with two feathers, and headed with a flint stone, which is loose, and hurting, the head remaining in the wound; some are headed with bone, and some with hard wood, halfe burnt in the fire. Wee came betwixt the iland and the mayne. On the south-west part of the iland lyeth a great ledge of rockes, which are dangerous; and it is good to bee carefull how to come too neere the iland on all parts.

Immediately when they discovered us, both upon the iland and the maine, wee might see them make sundry great fires, which were to give advise to the rest of the people to be in a readinesse : for they have continuall and mortall warre with the Spaniards, and the shippes they see they beleeve to be their enemies. The citie imperiall lyeth over against this iland, but eight or tenne leagues into the countrey: for all the sea coast from Baldivia till thirty-six degrees, the Indians have now, in a manner, in their hands free from any Spaniards.

Having refreshed our selves well in this iland, for that little time wee stayed, which was some three dayes, wee set sayle with great joy, and with a fayre winde sayled alongst the coast.

- Pedro Mariño de Lovera (1590s)

Mariño de Lovera 1865:366:

Salió el gobernador a este partido tanto con mas voluntad cuanto mas entendió haber sido el tratamiento que el cacique habia hecho a Juan de Fuentes era como de hermano, y no como de enemigo. No fué poco venturoso este soldado en haber sido captivo hasta entónces por ser costumbre de los indios despedazar luego al español que han a las manos de suerte que son contados los que han sido libres habiendo caido una vez en ellas. De las cuales fué el primero Antonio de Rebolledo que estuvo dos años preso en la isla de la Mocha, y Juan Sánchez que habia sido preso en una de las batallas del gobernador Valdivia, y don Alonso Mariño de Lovera que estuvo cinco dias preso entre los adversarios con tres heridas peligrosas y fué libre de las prisiones por la buena dilijencia de su padre don Pedro Mariño de Lovera, que con el amor paternal se atrevió a sacarle con solos nueve de a caballo, y catorce arcabuceros que llevaba el capitan Lamero, los cuales dieron a los indios batalla campal y libertaron al capitan con otro compañero suyo hijo del capitan Rodrigo de Sande.

- Jacques Mahu and Simon de Cordes (1599)

His voyage by the Magellan Straights to Japan, written in two letters by himself, by William Adams.

Wieder 1925:59:

The next day wee waited and went over to the Island Sancta Maria, where we found our Admiral who had arrived there foure daies before us, and departed to the Isle from Mucha the day before we came from thence, having the Generall, Master, and all his Officers wounded on land : and God had so plagued us, that all our Officers were slaine, so that the one of us bemoned the other.

A letter of William Adams to his wife from Japan, by William Adams.

Wieder 1925:71-72:

So the third day, in great distresse, we set our course for the Island of Santa Maria, where we found our Admirall: whom when we saw, our hearts were some what comforted: we went aboord them, and found them in as great distresse as we, having lost their Generall, with seven and twentie of their men slaine at the Island of Mocha: from whence they departed the day defore we came by.

- Oliver van Noort (1600)

Voorreden

IJzerman 1926:VI

Voorts buyten de Strate by de Geuse Bay ontrent *Capo Desirado* vonden wy veel cleyne Eylanden, leggende langs de Custe van *Chili*, daer wy deur ende voorby seylden, tot dat wy quamen aen de Eylanden *La Mocha* ende *S. Maria*, maer onder wegwn op de 46. graden, verloren wy tschip *Hendricus Fredericus*, daer *Pieter de Lindt* (nae het deportement van den voorsz van *Ulpendam*) Vice-Admirael was opgemaect: denwelcken wy met alle zijn volc noydt t'zedert meer hebben vernomen. Op *La Mocha* hebben wy ons tamelijc ververscht, ende aldaer ooc eenige mangelinghe teghens alderhande eetwaren, die wy hoochnoodich van doen hadden, ende zijn daermede gheseylt nar het Eylant van *S. Maria*, alvaer wy een Spaens Schip vonden.

Beschryvinghe vande voyagie

IJzerman 1926:54-58

17 Maart.

Den 17. dito was de wint z. z. o. met goede coelte, deden ons cours n. n. o. De Sonne op 39. en een half graet, gisten ontrent 30. myl vant landt te zijn. De Generael heeft de Stuerluyden last ghegeven om aent Eylandt van *la Mocha* te seylen, ende setten ons cours o.n. o. ende o. ten noorden.

19 Maart.

Den 19. dito was de wint zuyelijck, deden ons cours o. ten z. doordien wy seer om de Zuydt raeckten, ende beneden *la Mocha* souden vervallen, meende nae gissinghe van de Stuerluyden nu al by landt te zijn, daerdoor wy vermoeden dat het lant van de straet *Magellanes* tot hier toe oostelijcker strect als noorden[1] , ende de stroom leyde ons meer om de noort, als wy ons cours setten, seylden al o.z.o. vernamen harde ravelingh ende stroom naer ons gissinghe om den Noort loopen. Des middaechs waren wy op de hooghte van 37. graden 54. minuten. *La Mocha* leyt op 38. graden stijf[2].

20 Maart.

Den 20. dito smorghens vernamen wy een dijs, t'landt liggende. oostelijck van ons; het was seer mistich disich weder, de wint n., seylden naert landt, daer wy ontrent smiddaechs by quamen, ende vernaemen dat het vaste landt van *Chili* was, liggende tusschen *S. Maria* ende *la Mocha*, seylden voorts zuyden aen omt landt van *la Mocha* te beseylen, het was des nachts calm.

21 Maart.

Den 21. dito des morgens, seylden wy naet lant toe, ende sagen een uythoec met een groote inwijck, t'welc wy meenden een Eylant te wesen, daer wy seer dicht by liepen, tot ontrent een half mijl, hadden 10. vadem santgront, daer wy doen vernamen dat het vaste lant was; wy sagen veel volcx opt Punt vergaren, te Paerde rydende[3], ende was een schoon playsant lant aen te sien, zijnde op veel plaetsen bebout. Dit was de hoec van *Imperiael*, welcke stadt te landewaert in gelegen is. Wy hebbent van daer gewent, ende sagen een Eylant ten w. Van ons, ontrent 5. oft 6 mylen t'Zeewaert in, daer wy nae toe seylden ende des avonts by quamen, hebbent geset aen de o. zyde op 14. vadem goede anckergront. Dit was t'Eylant van *la Mocha* liggende op 38. gra. het is een groot Eylant, hebbende int midden een hoogh gebrecht met een keep int midden doorgaende, daer een versch Rivierken afloopt, ende aen de voet van desen Berch ist vlack ende effen landt tot aent water.

De Generael heeft de Sloup aen lant gesonden met een deel volcx, om te sien of wy met vrientschap conde handelen, daertoe emploierende een Man (genaemt *Ian Claessz*) die verwesen was aen een vreemt lant te gaen[4], welcke alleen opt Eylant ghinck, met eenige schenckagien van Messen, Ijser en Paternosters, welcken sy seer vriendelijck ontfingen, maer wesen dat het nu laet was, ende dat hy op morgen soude wedercomen, dies sy wederom aen boort voeren. Wy vermoeden dat hier wel Victualie soude zijn te becomen, overmidts dat wy veel Schapen ende Beesten saghen weyden, met schoon ghebout Landt.

22 Maart.

Des anderen daechs smorgens zijn wy met twee Sloupen aent Eylandt ghevaren met een deel Bylen ende Norenburgher Messen. Wy roeyden met den eenen boot dicht byt Landt in een Killeken, want het overal seer steenich is; daer zijn d'Inwoonders by ons gecomen, die met ons ruylden, voor elcke Bijl een Schaep, voor een Mes een Hoen, jae somtijdts wel twee, ende voorts andere Victualie, als Mais, Batattas wortelen[5], Pompoenen ende andere Vruchten die daer wassen; hebben ons boots daermede gheladen ende aen boort ghebrocht, met twee van de principaelste *Casiques* ofte Heeren vant Landt, die mede uyt haren eyghen wille aen den Admirael quamen, die haer seer wel ghetracteert heeft; sy bleven dien nacht scheep, maer costen haer niet verstaen, dan wesen ons met teyckenen, dat tot *Baldivie* eenighe Spaengiaerts den hals afghesneden waren, ende wisten de plaetsen te noemen, als *Arauco* ende *Tuccapel*[6], welck aldaer teghenover leydt aen de Cust van *Chili*, als hiernae breeder sal verhaelt worden[7].

23 Maart.

Den 23. dito zijn wy metten Bock weder aen Landt ghevaren, ende naedat wy de Inwoonders met eenighe schenckagien (als Hembden, Hoeden, ende andere dinghen) vereert hadden, ghinghen wy mede tot aen haer woonplaets, daer een Dorp stont van ontrent vijftich huysen, welck van stroo ghemaeckt zijn, ende van fantsoen lanckwerpich, met een Portael int midden, maer zy wilden ons daer niet laten ingaen, noch by haer Vrouwen comen, die altemael uyt haer huysen quamen, ende door een geroep dat de Mans deden, saten op haer knien in twee oft drie hoopen. De Mans wesen ons te sitten op blocken, die int Velt stonden. Daer quam een oude Vrou by ons, die bracht een aerde Kan vol van haren Dranck (welck sy *Cici*[8]) noemen. Wy droncken daer hartich van, ende smaecten uyten suyren. Desen Dranck wort gehemaeckt van Mais (welck haer Terwe is), ende water, d'welck sy in deser manieren brouwen: De oude Vrouwen die qualijck tanden hebben, knauwen de Mais, ende doort quijl ende seeveringhe van de oude Vrouwen, so gijlt oft gest de Dranck, die sy dan in Cuypen doen. Sy hebbender oock eeinghe superstitie in, hoe de Dranck van ouder Vrouwen gheknaut wordt, dies te beter is. Hiervan drincken de Indianen droncken, ende houden daer fare Feesten mede, welcke gheschiedt op dese maniere: Sy doen alle het volck van het Dorp by malcanderen vergaderen, ende daer staet een op eenen Pael omhooghe, die eenich gheluydt maeckt met Fluyten oft singhen, ende drinken soo rondtom.

Opt dit Eylandt heeft eertijdts een Spaengiaert gehweest, die met een Berck aen de westzyde van het Eylandt ghebleven was, ende desen Spaengiaert was allen[9] daer afghecomen, ende hadde hem opt Eylandt ghebercht, daer hy hem wel drie oft vier Jaren onthouden hadde; maer als de Inwoonders droncken waren, moest hy hem verberghen, ende en dorste dan niet by haer haer comen, want hy wel wiste wat vyantschap sy de Spaengiaerts draghen, hadde hem daerom bekent ghemaeckt met de suster van een van de principaelste, die hem dickwils verberchde, ende daerdoor hem aldaer soo langhe onthouden hadde. Dese Indianen nemen so veel Vrouwen als sy connen voeden, ende die veel Dochters heeft is rijck, want diese begeert, moetse van der Vader coopen, voor Ossen, Schapen, Vee oft anders t'ghene sy estimeren; sy leven seer vry onder malcanderen, maer so daer yemandt doot gheslaghen wort, moghen de vrienden van den doode tselve wreecken met ghelijcke doot aen den Misdadighen, oft ten zy dat hem den Dootslagher met haer versoene, ghevende daer *Cice*, twelck hy Jaerlijks moet betalen. Op dese manier leven meest alle die van *Chili*, die welcke onder het spaens ghebiet niet zijn, sy gaen hier ghecleet met rocken onder en boven, die sy maecken van Wol van groote Schapen. Dese voorseyde Schapen hebben seer langhe halsen, ende de Wol is hem so lang datse bycants aen de aerde hanght; dese Schapen ghebruycken sy tot haren arbeyt, ende om last te draghen, ende als die moede ghearbeyt zijn, canmense met slaen niet voorder cryghen, ende keerent hooft nae u toe met een groote stanck, diese van haer geven[10]. Sy en wilden ons dese Schapen niet vercoopen, maer ander, die van fatsoen zijn als de schapen in ons Lant, wesende seer vet en schoon; wy creghen hier oock Hoenderen, schapen ende veelderhande Fruyt, vor Bylen ende Messen, want zijt gemaect Ijser seer begeren, overmits syt ten diersten aent vaste Landt weten te vercoopen.

24 Maart.

Den 24. dito smorgens was de wint n. o. zijn weder aen lant gevaren, halende noch eenich Fruyt; maer die vant Eylant wesen ons wech te seylen, ende wy zijn met alle vrientschap van daer gescheyden. Alsoo wy hier wel redelijck versien waren, heeft de Admirael een schoot doen schieten om tseyl te gaen, hebbende ons Anckers ghelicht, seylende naer het Eylant *S. Maria*, welck leyt noort noort oost, ende zuydt west 18. mylen van *la Mocha*, de wint was noorden, ende laveerden uytwaert aen. Dit Eylandt van *la Mocha* leydt op 38. graden stijf ontrent 5. oft 6. mylen vant vaste landt, ende de gront tusschent lant is 12. vadem diep, ende is heel vlacke gront. Snachts wast heel calm.

IJzerman 1926:Plaat 9

La Moche in Chili

La Mocho in Cili een van haer Dorpen, zijnde de Huysen veel aen den anderen, met twee oft drie ingangen, sy ontfingen ons seer vriendelic, dan in hare huysen wilden sy ons niet laten comen; sy gaven ons te drincken eenen dranc van haer wortelen[11] gemaeckt, haer Lant is wel bebout, hebbende overvloet van tweederley schapen, de eene soorte als de onse, de andere soorte zijn grooter, de wolle soo langh tot op de aerde hangende, met lange halsen[12], dit zijn als by ons de Ezels, haer lastdraghende beesten, van desen mochten wy niet crijghen, maer van de andere ghenoech, voor een Bijl een Schaep, vor een Mes twee hoenders, etc.

IJzerman 1926:Plaat 10

Les habitans de la Mocho

De Inwoonders opt Eylandt La Mocho zijn ghecleet met Rocken, gemaeckt van de Wol van de lanckhalsde schapen, de Mans laten het hayr by t'hooft lanck neerhangen, maer de Vrouwen bindent achter in de neck te samen, sy zijn haer Mans seer onderdanich, ende nemen, so veel Vrouwen als sy voeden connen, die worden haer van de Vaders vercoft voor Ossen, Schapen, en anders; daerom die veel dochters heeft is rijc, die een dootslach doet wordt effen alleens wederom ghedoot, ten ware dat hy hem versoende, dat dickwils gheschiet met Circe jaerlicx te geven, dat aldaer haren dranck is, die van hare oude wijven gemaeckt wordt, daer sy haer seer vrolick in maken.

Extract

IJzerman 1926:175

Den 19[13] heeft den Generael last ghegheven den Stierlieden te zeylen aent Eylandt La Mocha.

Den 20 ontrent den middach quamen wy by het vaste Landt van Chyle, tusschen S. Maria ende La Mocha.

Den 21 zeylden wy na landt, ende vernamen dattet vast landt was, zaghen veel volcx op den punt rijdende te paerde, was een schoon playsant landt om aen te zien, ende was den hoec van Imperael, welc een stadt is te landtwaert, ende zaghen een Eylandt ten Westen van ons ligghen, daer wy na toe zeylden, ende quamen daer ontrent den avont, ende dit was het Eylandt van La Mocha. Den Generael heeft de Sloep aen landt gezonden, met een deel volcx, om te zien oft wy met vriendtschap konden handelen, daertoe employerende een man die verwesen vas aen een vreemt landt te gaen, dewelcke alleen opt Eylandt ghinc met eenighe schenckagien yserwerc, messen ende paternosters. Sy ontfingen hem vriendelijc, ende bewesen dattet nu laet was, ende op morghen weder zoude komen; zijn alzoo weder aen boordt gheroeyt, verhopende daer wel victualie te becomen, want wy zagender veel Schapen ende Beesten weyden, met schoon ghebout landt.

Den 22 zijn wy met Sloepen aent Eylandt van La Mocha ghevaren met een deel bijlen ende Noorenborgher messen, ende hebben met hun gheruylt, voor elcke bijl een Schaep, ende voor een mes een Hoen, zomtijdts twee, ende voorts ander victualie als Mayes, Batattes wortelen, Pompoenen, etc. ende hebben onse Sloepen daermede geladen, ende aen boordt ghebracht twee van de principaelste Cassiques oft Heeren van lant, die mede wt hunnen vryen wille by den Admirael quamen, dewelcke hy wel getracteert heeft, ende bleven dien nacht tscheep, wijsende met teeckenen eenighe dinghen, int Journael verhaelt, als ooc de verhandelinghe ende hun maniere van leven.

Den 24 tsmorghens zijn weder aen landt ghevaren, halende noch eenighe Schapen ende fruyten, maer die vant Eylandt wesen ons dat wy zouden wech zeylen, maer wisten niet waerom, ende zijn zoo met alle vrientschap bewesen hebbende, weder aen boordt ghekomen.

IJzerman 1926, Footnotes

[1] Zie de kaart van Plancius achter Dirck Gerritsz. Pomp. Linsch. Vereen. 1915.

[2] De vuurtoren op de westkust van La Mocha ligt op 38° 21' Z.B.

[3] Dit waren Araucanen, die La Imperial insloten.

Na een langdurigen en verbitterden strijd waren de Spanjaarden er in geslaagd de Araucanen, die het zuidelijk deel van Chili bewoonden, tot onderwerping te brengen. Schijnbaar hadden deze vrijheidlievende Indianen zich in hun lot geschikt. Overal heerschte orde en rust. Verschillende steden aan de kust en in het binnenland begonnen zich voordeelig te ontwikkelen. Maar gehel onverwacht brak er een algemeene opstand uit. De gouverneur van Chili, Martin Garcia Oñez de Loyola, neef van den heiligen Ignatius, werd 23 December 1598 te Curalaba door de Araucanen overvallen en gedood. Hiermede was het sein gegeven tot een algemeenen aanval op de onderdrukkers. De verspreide kleine versterkingen der Spanjaarden werden onmiddellijk door de Indianen vermeesterd; slechts in de steden konden de zwakke bezettingen zich met moeite staande houden.

De plaatsvervangende gouverneur van Chili, de 70-jarige Pedro de Viscara had zich 12 Januari 1599 naar Concepción begeven, maar met de geriuge middelen, waarover hij beschikte, kon hij weinig uitrichten. Den 7den Maart moest hij Santa Cruz laten ontruimen; de 8sten April werd La Imperial, de tweede stad van het zuiden, door de Araucanen in de asch gelegd, terwijl de verdedigers, 90 in getal, zich in het versterkte huis van de bisschop moesten terugtrekken.

Bij het ontvangen van het bericht van Loyola's sneuvelen had de onderkoning Don Luis de Velasco (Zie Dirck Gerritsz. Pomp, p. 43 noot 2) honderd soldaten onder Francisco de Quiñones uit Lima rechtstreeks naar Concepción gezonden. Deze onverschrokken aanvoerder, einde Mei aangekomen, kon met zijn geringe macht niet krachtig optreden. Eenige versterking werd naar het bedreigde Arauco gezonden, maar aan het ontzet van La Impérial kon voorloopig niet worden gedacht.

Inmiddels volgde de eene ramp op de andere. 13 September ging Chillon, tusschen Santiago en Concepción, verloren. In den nacht van 24 November werd Valdivia door de Araucanen overrompeld. De bevelhebber Gomez Romera en meer dan 100 man der bezetting sneuvelden, terwijl 400 vrouwen en kinderen gevangen werde genomen. De enkele dagen later aankomende Spanjaarden vonden slechts de puinhoopen der geheel verwoeste stad.

Voortdurend moest de onderkoning naar aanleiding van de droevige tijdingen, die hem achtereenvolgens bereikten, bedacht zijn op aanvulling der strijdkrachten in Chili; maar dit ging bezwaarlijk, omdat hij de kustplaatsen van Peru niet geheel durfde ontblooten met het oog op den uit zee verwachten vijand.

Eindelijk 14 Februari 1600 bracht Gabriel de Castilla voldoende versterking te Concepción en kon Quiñones aanvallenderwijze te werk gaan. Den 13den Maart versloeg hij de Araucanen bij Angol en ontzette die stad; den 30sten volgde de bevrijding van La Impérial. Weinige dagen te voren verscheen Olivier van Noort op de kust.

[4] Dit vonnis was uitgesproken op het eiland S. Clara, zie p. 24.

[5] Aardappelen. Verg. Wieder. I, p.35.

[6] Arauco aan de kust ten Z.O. van La Mocha; in dezelfde richting Tucapel, landwaarts in.

[7] De voorgangers van Van Noort, voor Spanjaarden aangezien, waren minder gelukkig geweest.

Drake was 29 November 1578 daar zelf met 10 man aan land gegaan en goed ontvangen, maar toen hij den volgenden morgen 2 man zond om eenige vaten met water te vullen, was de stemming geheel veranderd. Deze lieden keerden niet terug en werden waarschijnlijk doodgeslagen. Drake en verscheidene anderen werden gewond.

Toen Cavendish 12 Maart 1587 aan wal wilde gaan, werd hij met pijlschoten begroet.

Simon de Cordes, die in het begin van November 1599 met het schip de Hope daar aankwam, werd met 27 der zijnen door inboorlingen gedood.

De Spanjaarden werden hier niet minder dan op den vasten wal gehaat. Eerst veel later rekenden zij met de bewoners van La Mocha af. In 1685 nam Jeronimo de Quiroja 700 hunner gevangen, die op een eiland in de Biobio tegenover Concepción geinterneerd werden. In 1687 volgde een tweede expeditie, waarbij de achtergeblevenen werden afgehaald, zoodat het eiland geheel ontvolkt was.

[8] Chica.

[9] alleen.

[10] De llama, het schaapkameel.

[11] Lees : mais.

[12] Maar geen bult op den rug, als hier geteekend.

[13] Het Journael zegt: 17.

Unpublished translation from Dutch to Spanish by Lies Wijnterp (2011)

Prefacio

IJzerman 1906:VI

Saliendo del Estrecho [de Magallanes], en Geuse Bay [Estero Córdova] cerca de Cabo Deseado, encontramos muchas pequeñas islas a lo largo de la costa de Chile. Navegamos por ellas y las pasamos, hasta que llegamos a las islas de La Mocha y Santa Maria. En el camino, en 46 grados, perdimos la nave *Hendrick Frederick* donde se había nombrado Vicealmirante a Pieter Esaiasz de Lint (después de la condena del citado Ilpendam). Nunca más volvimos a ver esa nave ni a toda su gente. En La Mocha pudimos proveernos bien de agua fresca, y también cambiamos para conseguir todo tipo de alimentos, los cuales necesitábamos imperiosamente. Con esto [agua y alimentos] navegamos a la isla de Santa Maria, donde encontramos una nave española.

Diario de viaje

IJzerman 1926:54-58

17 de marzo

El 17 del mismo el viento venía fuerte del sursureste y navegamos al nornordeste. Estábamos en 39½ grados y pensábamos estar alrededor de 30 millas de la tierra. El general dio orden a los timoneles de navegar a la isla de La Mocha. Navegamos hacia el estenordeste y este al norte.

19 de marzo

El 19 del mismo el viento venía del sur. Al sur navegamos hacia el este, por lo que bajamos mucho al sur e íbamos a llegar debajo de La Mocha. Los timoneles pensaban que ya estábamos cerca de la tierra y por eso supusimos que la tierra del Estrecho de Magallanes aquí está más hacia el este que en el norte.[1] La corriente nos llevó por el norte y navegamos hacia el estesudeste. Había una corriente fuerte y agitada hacia el norte. Por la tarde estábamos en la altura de 37 grados, 54 minutos. La Mocha está en 38º.[2]

20 de marzo

La mañana del 20 del mismo vimos niebla, la tierra estaba al este de nosotros. Era neblinoso y calinoso, el viento soplaba del norte. Navegamos a la tierra, a la que llegamos por la tarde, y vimos que era la tierra firme de Chile, entre Santa Maria y La Mocha. Navegamos hacia el sur para llegar a La Mocha. Por la noche estuvo tranquilo.

21 de marzo

La mañana del 21 del mismo navegamos a la tierra y vimos una lengua de tierra con una bahía grande, y primero pensamos que era una isla. Pasamos cerca, a media milla aproximadamente, donde encontramos suelo arenoso a diez brazas. Entonces vimos que era tierra firme. Vimos mucha gente, a caballo,[3] que se juntaba en el punto. La tierra estaba bonita y se había cultivado en muchos sitios. Éste era el cabo de La Imperial, una ciudad que está tierra adentro. Navegamos hacia el mar y vimos una isla a cinco o seis millas al oeste de nosotros. Navegamos hacia allí y por la noche echamos anclas en la parte este, en buena tierra de ancla a catorce brazas. Ésta era la isla de La Mocha en 38 grados. Es una isla grande con una montaña grande en el medio, con una muesca en el medio por donde baja un pequeño río de agua dulce. Al pie de esta montaña la tierra es lisa, hasta el agua.

El general envió el bote a tierra con alguna gente para ver si podíamos transar en amistad. Utilizó para esto a un hombre (llamado Jan Claasz) a quien habían condenado a desembarcar en tierra desconocida.[4] Él fue solo a la isla con algunos regalos como cuchillos, hierro y padrenuestros, que ellos recibieron amistosamente, pero indicaron que ya era muy tarde que él volviera al día siguiente, con lo que regresaron a bordo. Pensamos que aquí se podrían obtener alimentos ya que habíamos visto muchas ovejas y animales pastando con tierra bien labrada.

22 de marzo

Al otro día por la mañana navegamos en dos botes a la isla con algunas hachas y cuchillos de Nuremberg. Remamos con un bote a una entrada, cerca de la tierra, ya que es muy rocoso en todas partes. Se nos acercaron los habitantes y nos cambiaron por cada hacha una oveja, y por un cuchillo una gallina, a veces incluso dos, y además otros alimentos como maíz, raíces de patatas[5], zapallos y otras frutas que allí crecen. Llenamos nuestros botes y llevamos todo a bordo, con dos de los principales Caciques o señores de la tierra, que voluntariamente quisieron ir donde el Almirante, quién los agasajó mucho. Se quedaron esa noche a bordo. No les pudimos entender, pero nos indicaron con señas que en Valdivia se habían degollado a algunos españoles y pudieron nombrar lugares como Arauco y Tucapel,[6] que se ubican allá enfrente de la isla en la costa de Chile, como se relatará a continuación.[7]

23 de marzo

El 23 del presente navegamos en bote nuevamente a la tierra y luego de honrar a los habitantes con algunos presentes (como camisas, sombreros y otras cosas) fuimos hasta el lugar donde vivían. Había un pueblo de cerca de cincuenta casas hechas de paja y de forma alargada, con un portal en el medio. Pero no nos dejaron entrar en ellas ni tampoco acercarnos a las mujeres, que salieron todas de sus casas. Luego de un llamado de los hombres ellas se arrodillaron en dos o tres grupos. Los hombres nos indicaron que nos sentáramos en troncos que estaban en el campo. Después se nos acercó una anciana que trajo un jarro de cerámica lleno de su bebida (la que llaman Cici).[8] Bebimos mucho. Tenía un sabor agrio. Esta bebida está hecha de maíz (que es su trigo) y agua y la preparan de esta manera: las ancianas que tienen malos dientes mascan el maíz y por la baba y la saliva de las ancianas fermenta la bebida que entonces guardan en tinajas. Tienen también la superstición de que si la bebida la hacen las más ancianas es mejor. Con esta bebida se emborrachan los indígenas y celebran sus fiestas, que se realizan así: hacen que se reúna toda la gente del pueblo, y uno se sube a un palo y emite algunos sonidos con flautas o canta, y así beben alrededor.

En esta isla una vez hubo un español, cuya nave se había deshecho en la parte occidental de la isla. Era el único[9] sobreviviente y se quedó a vivir en la isla durante tres o cuatro años. Cuando los habitantes estaban ebrios, tenía que esconderse y no se atrevía a acercarse, porque sabía que odiaban a los españoles. Era amigo de la hermana de uno de los jefes. Ella lo escondía a menudo y por eso sobrevivió tanto tiempo allí. Estos indígenas toman tantas mujeres como pueden alimentar, y el que tiene muchas hijas es rico porque el que las desea debe comprarlas del padre por bueyes, ovejas, ganado o alguna otra cosa que ellos estiman. Viven libremente entre ellos, pero si se mata a alguien a golpes, los amigos del muerto pueden vengarlo con la misma suerte para el criminal, a menos que el que mató se amiste con ellos entregándoles Cice [sic], la que tienen que pagar anualmente. De esta manera viven casi todos los de Chile que no están en territorio español. Visten aquí faldas abajo y arriba que fabrican de la lana de ovejas grandes. Las mencionadas ovejas tienen cuellos muy largos y la lana es tan larga que casi les llega al suelo. Estas ovejas las usan para su trabajo, y para llevar carga. Cuando se cansan de trabajar no se les puede obligar a seguir ni a golpes; y vuelven la cabeza hacia uno con una gran hediondez que echan.[10] No nos quisieron vender estas ovejas sino otras que son como las ovejas de nuestra tierra, siendo muy gordas y bonitas, también nos dieron gallinas, ovejas y diferentes tipos de frutas a cambio de hachas y cuchillos porque apetecen mucho el hierro trabajado. Pueden venderlo en tierra firme a precios altos.

24 de marzo

En la mañana del 24 del mismo, el viento era del noreste y navegamos a la tierra. Queríamos buscar algunas frutas, pero los habitantes nos hacían señas de que teníamos que irnos y pues salimos en amistad. Teníamos suficiente cantidad de comida fresca a bordo y el almirante disparó un tiro para darse a la vela. Levamos anclas y navegamos a la isla de Santa Maria, que está a 18 millas al nornordeste de La Mocha. El viento venía del norte y navegamos distanciándonos de la costa. La isla de La Mocha está en 38 grados, alrededor de cinco o seis millas de tierra firme. Entre la isla y la tierra firme la profundidad es de doce brazas y el fondo del mar es liso. Por la noche estuvo tranquilo.

IJzerman 1926:Ilustración 9

La Mocho [sic] en Chile y uno de sus pueblos, teniendo las casas juntas, con dos o tres entradas. Nos recibieron amistosamente aunque no nos dejaron entrar en sus casas. Nos dieron a beber una bebida fabricada de sus raíces[11]. Su tierra está bien labrada teniendo abundancia de dos tipos de ovejas, un tipo como el nuestro y otro que es más grande con la lana tan larga que les cuelga hasta el suelo y con cuellos largos[12]. Son como nuestros burros, sus bestias de carga. De éstas no nos quisieron dar, pero de las otras suficientes. Por un hacha una oveja, por un cuchillo dos gallinas, etc.

IJzerman 1926:Ilustración 10

Los habitantes en la isla de La Mocho [sic] van vestidos con faldas hechas con la lana de las ovejas de cuello largo. Los hombres llevan el pelo largo y suelto pero las mujeres lo atan junto en la nuca. Ellas son muy sumisas ante sus hombres, que toman tantas mujeres como pueden alimentar, las que son vendidas por sus padres por bueyes, ovejas y otras mercancías. Y es por eso que el que tiene muchas hijas es rico. Aquel que mata a alguien es a su vez matado a menos que se amiste, lo que sucede regularmente dando Circe [sic] cada año, que es su bebida. La bebida es fabricada por las ancianas y los pone muy alegres.

Extracto

IJzerman 1926:175

El 19[13] el general dio orden a los timoneles de navegar a la isla de La Mocha.

El 20 por la tarde llegamos a la tierra firme de Chile, entre Santa Maria y La Mocha.

El 21 navegamos a la tierra y vimos que era tierra firme. Vimos mucha gente en el punto, a caballo, y la tierra estaba bonita. Era el cabo de La Imperial, que es una ciudad tierra adentro. Vimos una isla al oeste de nosotros, navegamos hacia allí y por la noche llegamos. Ésta era la isla de La Mocha. El general envió el bote a tierra con alguna gente para ver si podíamos transar en amistad. Utilizó para esto a un hombre a quien habían condenado a desembarcar en tierra desconocida. Él fue solo a la isla con algunos regalos como herraje, cuchillos y padrenuestros. Lo recibieron amistosamente, e indicaron que ya era muy tarde y que volviera al día siguiente. Volvieron a bordo remando con la esperanza de obtener alimentos allí, porque habíamos visto muchas ovejas y animales pastando con tierra bien labrada.

El 22 navegamos en botes a la isla de La Mocha con algunas hachas y cuchillos de Nuremberg y cambiamos con ellos, por cada hacha una oveja, y por un cuchillo una gallina, a veces dos, y además otros alimentos como maíz, raíces de patatas, zapallos etc. Llenamos nuestros botes con todo y llevamos a bordo a dos de los principales Caciques o señores de la tierra y que voluntariamente quisieron ir donde el Almirante, quién los agasajó mucho. Se quedaron esa noche a bordo y nos indicaron con señas algunas cosas, que se relatan en el diario, y también hablaron de su manera de vivir.

En la mañana del 24 quisimos buscar algunas ovejas y frutas, pero los habitantes de la isla nos hacían señas de que teníamos que irnos. No sabíamos por qué, pero después de haber mostrado toda nuestra amistad volvimos a bordo.

IJzerman 1926, Notas al pie

[1] Veáse el mapa de Plancius en Dirck Gerritsz. Pomp. Linsch. Vereen [Asociación de Linschoten, que publicaba crónicas de viaje]. 1915.

[2] El faro en la costa oeste de La Mocha está en 38°, 21', Lat. Sur.

[3] Eran araucanos, que cercaron La Imperial. Después de una lucha prolongada y feroz, los españoles habían logrado someter a los araucanos, que habitaban la parte meridional de Chile. Aparentemente, estos indígenas amantes de la libertad se habían conformado con su suerte. En todas partes dominaba el orden y la tranquilidad. Varias ciudades en la costa y en el interior empezaron a desarrollarse favorablemente. Pero de forma completamente inesperada se desató una revuelta general. El 23 de diciembre de 1598 los araucanos asaltaron y mataron al gobernador de Chile Martin Garcia Oñez de Loyola, sobrino de San Ignacio, en Curalaba. Con esto, dieron la señal de un ataque general a los opresores. Las pequeñas fortificaciones dispersas de los españoles fueron dominadas inmediatamente por los indígenas; sólo en las ciudades las débiles guarniciones pudieron mantenerse a duras penas.

El gobernador interino de Chile, Pedro de Viscarra de 70 años de edad, se había dirigido a Concepción el 12 de enero de 1599, pero con los escasos recursos de que disponía, no pudo hacer mucho. El 7 de marzo tuvo que ordenar el desalojo de Santa Cruz; el 8 de abril los araucanos redujeron a cenizas La Imperial, la segunda ciudad del sur, mientras que los 90 defensores tuvieron que retirarse a la casa-fuerte del obispo.

Al recibir la noticia de la muerte de Loyola, el virrey Don Luis de Velasco (ver Dirck Gerritsz. Pomp, p. 43 nota 2) había mandado 100 soldados de Lima bajo Francisco de Quiñones directamente a Concepción. Este líder impávido que llegó a finales de mayo, no pudo actuar con mano dura por su escasa fuerza militar. Se mandaron algunos refuerzos al Arauco en peligro, pero de momento no era posible liberar La Imperial.

Entretanto, un desastre seguía al otro. El 13 de septiembre se perdió Chillán, entre Santiago y Concepción. En la noche del 24 de noviembre, los araucanos tomaron Valdivia desprevenidamente. El comandante Gomez Romera y más de 100 hombres de la guarnición murieron en combate, mientras que aprisionaron a 400 mujeres y niños. Los españoles que llegaron algunos días después sólo encontraron las ruinas de la ciudad completamente destruida.

Con ocasión de las tristes noticias que le llegaron sucesivamente, el virrey tuvo que estar continuamente preparado para complementar las fuerzas armadas en Chile; pero esto era difícil porque no se atrevía a desembarazar las localidades costeras de sus fuerzas a causa del enemigo que cabía esperar desde el mar.

El 14 de febrero de 1600 Gabriel de Castilla al fin trajo suficientes refuerzos a Concepción y Quiñones pudo tomar la ofensiva. El 13 de marzo derrotó a los araucanos en Angol y liberó esa ciudad; el 30 siguió la liberación de La Imperial. Pocos días antes Olivier van Noort apareció en la costa.

[4] Pronunciaron esta sentencia en la isla de St. Clara, ver p. 24.

[5] Papas. Compare con Wieder. I, p. 35.

[6] Arauco, en la costa al sureste de La Mocha; en la misma dirección, Tucapel, tierra adentro.

[7] Los predecesores de Van Noort, que se tomaron por españoles, habían tenido menos suerte.

El 29 de noviembre de 1578, el mismo Drake había desembarcado con 10 hombres y había sido bien recibido, pero cuando a la mañana siguiente mandó dos hombres para llenar algunos barriles con agua, el ambiente había cambiado por completo. Esta gente no volvió y probablemente fue matada a golpes. Drake y varios otros resultaron heridos.

Cuando Cavendish quiso desembarcar el 12 de marzo de 1587, le recibieron a flechazos.

Simon de Cordes, que llegó allí a principios de noviembre de 1599 con el buque Hope, fue matado por indígenas con 27 de los suyos.

Aquí no se odiaba menos a los españoles que en la tierra firme. No hasta mucho después, los españoles ajustaron cuentas con los habitantes de La Mocha. En 1685 Jeronimo de Quiroga tomó preso a 700 de ellos, que se internaron en una isla en el Biobio enfrente de Concepción. En 1687 una segunda expedición llevó a los que se habían quedado atrás, de modo que la isla quedó despoblada por completo.

[8] Chica.

[9] [La nota en IJzerman corrige la ortografía holandesa de la palabra 'solo, único'].

[10] La llama, el camello-oveja.

[11] Léase: maíz

[12] Pero no con la joraba en el lomo con la que se les dibuja aquí.

[13] El diario dice: 17.

- Joris van Speilbergen (1615)

Van Speilbergen 1906:51-53:

Sailing in this fashion, we came in sight of the land of Chili on the 21st wherefore we turned seawards again, west-nor'-west, and saw lying in that direction an island which we deemed to be La Mocha, and on casting the lead we found 38 fathoms, with a very good sand bottom. All the afternoon we had a boisterous wind from the nor'-nor'-east, with drizzly weather.

On the morning of the 22nd the same weather continued, with much rain; towards midday it grew calm, the wind veering to the west, and we took our course to the north-east.

Very early on the 23rd, we could see the Island of La Mocha distinctly, wherefore, the wind coming from the south, we sailed eastwards under full sail until noon, when, on account of the wind falling, we could make no further progress. The Admiral then caused a cannon-shot to be fired in order to summon the Broad Council. And towards the evening we took in the top-sails in order to make less progress, casting the lead in 60 and 70 fathoms until night- fall, when it grew quite calm.

Before daybreak on the morning of the 24th, we got the wind from north by east with a fine breeze, and set our course east by north, so that by daybreak we were two or three miles athwart the land, casting anchor in 18 fathoms upon a very good and proper bottom.

Since we could not get to the island on account of the contrary wind, we tacked the whole day long until nightfall, when we cast anchor in 17 fathoms, about a mile from the island, there being on the north side low land of great extent and on the south side many rocks, against which the sea dashed with a great roar.

On the morning of the 25th, we set sail again, trying to get up the river by tacking, but could make no progress the whole of that day until the evening, when we anchored half a mile from the shore in 13 fathoms, where the Admiral had the Broad Council summoned.

At daybreak on the 26th, the Admiral again summoned the Council, when it was resolved that four boats, well armed and manned, should be sent to the land with some merchandise. Wherefore, the Admiral himself and many others of the Council shortly afterwards proceeded thither. On landing, they found numbers of the inhabitants on the shore, having with them many kinds of provisions-such as sheep, fowls, and other poultry, both cooked and raw; and offering all these to us, they bade us welcome, evincing every kind of friendship and good-will towards us.

At noon the Admiral came on board with all the provisions, bringing with him the chief of the island and his son, who were very well received and entertained by the Admiral and other officers. After dinner, the Admiral had them taken all over the ship, showing them the guns and their use, and indicating to them by signs that we came to fight the Spaniard with these, which they gave us to understand was agreeable to them, as being enemies of the aforesaid. They remained all night with the Admiral, and they were regaled with good cheer as in the evening.

On the 27th, the Admiral had all his troops drawn up in order on the ship fully armed, which pleased these Chileans very much.

After breakfast, these two were accompanied ashore by nearly all the nobles of our fleet, and were honoured by a salute of a few guns.

On landing, we again exchanged some hatchets, beads, and other trifles for a large number of sheep. They gave us for a service axe two fat sheep, and received us with every amiability, but they did not permit any of us to come into their houses or near their wives, bringing everything to the boats themselves. At last, they made signs to us with their hands that we should get into our boats and depart, which, by order of the Admiral, was immediately done, and at the same instance we weighed anchor and set sail with a southerly wind, taking our course to the north.

In this last journey we had made ashore we brought back on board a sheep of a very wonderful shape, having a very long neck and a hump like a camel, a hare lip, and very long legs. They till their land with these sheep, employing them instead of asses or horses. Of other sheep we procured here more than a hundred, which were very large and fat, having white wool as in our country, and in addition to these a large number of fowls and other poultry, by which our men were greatly set up, for which the Admiral gave them some hatchets, knives, shirts, hats, and other similar things, so that we parted from each other in great friendship.

These Chilenoises were well-mannered, very polite and friendly, very orderly in their eating and drinking, of good morals, and almost equal to Christians; and if the Admiral had been willing to tarry there longer, they would not have refused to provide us with more sheep and other things, but the resolution had been arrived at to pursue our journey in God's name. On the morning of the 28th, we had a good wind from the south and sailed nor'-nor'-east, so that by midday we came in sight of the continent, which we opined to be Sancta Maria.

Plate 4, La Mocha

A. Are our boats in which we rowed ashore to trade with them.

B. Is the manner in which we traded with the people of La Mocha, exchanging hatchets and knives for sheep, fowls, and fruit.

C. Is the manner of sitting with their legs cross-wise, like the tailors sit in Christian countries.

D. Is the manner in which our trumpeters and other musicians gave a grand concert on the beach.

E. Are the La Mochyanes who listened to that playing with great pleasure.

F. Are their houses or huts, into which they would not let our comrades come.

G. Is the manner in which they bring along their sheep and other commodities to barter them.

H. Was our yacht, which lay close to the shore.

I. Are our four other ships, with which the boats kept up constant communication.

K. Is their manner of dress or clothing.

L. Is the strange shape of some of their sheep, which have a hump on the back like a camel.

- Luis Tribaldos de Toledo (1625)

Tribaldos de Toledo 1864:13:

Enfrente de esta entrada en el dicho desguadero poco mas de dos leguas la mar adentra al Oeste está la Isla de la Mocha, tiene mas de mil diez indios rebeldes que socorren a los de guerra proveyéndoles de comida, leña y frutos de su tierra, y lo mismo hacen al enemigo holandes cuando llega a esta Isla. Pero el uno y otro socorro se podría bien escusar, si de ello se diese a quien con buen celo se emplearía en ello y lo ejecutaria con jeneral aprobacion.

- Francisco Núñez de Pineda y Bascuñán (1629)

Núñez de Pineda y Bascuñán 1863:178:

Pues teneis razon, capitan, me respondió el cacique, que por una parte, parece que interiormente me hallo consolado y con gusto con las razones que me habeis dicho, y por otra parte, no dejo de sentir y lastimarme juzgándome sin la presencia y compañia de mi hijo; mas como vos decis y es cierto, que todos somos mortales, como nos lo muestra la experiencia con la muerte de tantos que cada dia vemos desamparar los cuerpos sus espiritus, y estos dicen los pasados y aun los presentes ancianos que no mueren, sino es que van tras de esas nevadas cordilleras a comer papas, o allende del mar, como sienten otros, tengo por mas verdadero lo que los españoles dicen, que los que tienen buen natural y han obrado segun las leyes de razon y de justicia y estan baptizados, van a ser cortesanos de los cielos, y los mal inclinados, sin fee, sin lei, ni razon, ni agua del baptismo, a ocupar los lóbregos lugares y a los calabozos del infierno se encaminan.

- Alonso de Ovalle (1646)

Ovalle 1646:62

De otra armada de Olandeses, cuyo General fue lorge Spilbergjo, refieren los mesmos Autores [Theodoro and luan de Bry] que llegaron a la Ysla de la Mocha, cuya costa Septentrional hallaron llana, y baxa, y la Austral rodeada de escollos. saltaron en tierra, y el agasajo, y regalo, que hallaron en ella de los Indios que la habitan, que son muy nobles, y de muy buenos naturales, es argumento de la fertilidad, y bondad de esta Ysla, donde haviendole refrescado la armada muy a placer, se proveyó de grande abundancia de Carneros, que los ay allí muy grandes, y muy buenos, de Gallinas, huevos, caza, y frutas de la tierra, con esto habiendo festejado los Oladeses a los Indios, que llevaron a ver sus navios, mostrandoles su artilleria, y la soldadesca, puesta enorden, dándoles de las cosas de Europa, sombreros, hachas , vestidos, y otras cosas de su estimacion, y haviéndolos vuelto a tierra, haziendoles salua Real. Ultimamente les hizieron los Indios señas con las manos, para que se volviesen a sus navios,y se fuessen, como lo hizieron.

Ovalle 1646:327:

El viejo viendo ya tan fatigado a su hijo, le hablo de esta manera [Ya es llegada la hora de vuestra muerte hijo mio, esforçaos, para que llegueis a la otra vida con bien, y mirad hijo mio, que en llegando a la otra parte del mar sembreis luego que lleguéis muchas auas, aluerjas, y maiz , papas, trigo, y ceuada, y de todas legumbres. Y haced vna casa grande, para que quepamos todos en ella, porque vuestra madre, y yo estamos ya mas de muerte, que de vida, por la mucha edad, que tenemos , que presto estaremos con vos por alla, y por ello os digo, que sembréis mucho, para que entremos comiendo, y con esto llorando vnos y otros se despidieron.

Ovalle 1646:396

Passando vno de los Padres que está en essa mission por vna Ysla, que dizen de la Mocha, quedó muy aficionado a los buenos naturales, que habitan aquella Ysla. y halló muy copiosa mies. porque en treinta y vno Caciques estaran repartidas 3000. Almas, a quienes no ha llegado la luz del Santo Evangelío, sino es acaso pasando algun navío para la Ysla de Chiloe también me insta encarecidamente socorra esta pobre gente, alegandome muchas razones para que embie dos Padres aquella mission.

Ovalle 1703:52

The same authors [Theodore and John de Brye], giving an Account of the other *Dutch* Squadron under *George Spilberg*, say, That they came to the Island of *Mocha*, and found the Northside of it plain and low, but the South full of Rocks: They Landed; and the good Reception they found from the *Indians* is an Argument of the Fertility of the Place. Those *Indians* are a Noble sort of People, and very good Natur'd. When they had Refreshed themselves much at their Ease, they made Provision of great Store of Sheep, who are very large, and in great plenty there; as likewise of Hen's, Eggs, Fruit, and other Provisions, They Treated the *Indians* on Board, and shewed them their Great Guns, and their Men in Order for Fighting: They presented them also with *European* Commodities; such as Hats, Clothes, Axes, and Things which they valued. After this they set them again on Shore, and the *Indians* made Signs to them to go back to their Ships, as they did

Diego de Rosales (1674)

Rosales 1877:55-56:

Con tan manifiestos detrimentos se extenuó el caudal de los mercaderes, y se le descaecieron los ánimos para nuevas empresas; pero porque no cayessen del todo apercibieron otra armada, a espensas del erario publico, los ordenes confederados de Holanda, presididos de Mauricio de Nasao, Principe de Orange. Dieron el supremo mando a Jorge

Espilvetgio, valeroso soldado y mui diestro marinero, y seis naves bien probeidas de gente artilleria, municiones y mantenimientos. Llamávanse estos bageles Nuevo Sol, Nueva Luna, Lucero, Eolo, Cazador y Gabiota. Navegaron con los sucesos ordinarios, parte de tormenta y parte de bonanza, desde ocho de Agosto de 1614, en que salieron del puerto de Tegel, hasta veinte y ocho de Marzo, que llegaron al cabo de las Virgenes: los marineros de la Gabiota, Lucero y Cazador se amotinaron, pero (ilejible) degollaron a unos y a otros los echaron a la mar, con que se refrenaron. Dudaron del progresso de la navegacion por el gran número de enfermos, pero mostrándoseles el tiempo favorable embocaron a veinte y cinco de Abril, y a seis de Mayo ya navegaban en el mar Meridional, y fué la navegacion mas breve y prospera que se ha hecho por aquellas inquietas angosturas. A veinte y quatro del mismo mes dieron fondo una legua de la isla de la Mocha, porque el viento les estorvó acercarse mas. Compraron carneros y gallinas, maiz y papas en cambio de achas, peines, cuchillos, cascabeles, y cuentas de vidrio. Al levar las anclas chocaron reciamente el Cazador y la Capitana y se trabaxó mucho en desenredarlas: por lo ménos se rasgaron las velas y cortaron la mayor parte de la jarcia y entenas. Estubieron en la isla de Santa Maria.

Rosales 1877:162-164:

Acerca de las animas (inintelijible) en vanos herrores, y distinguen (inintelijible) suertes de personas, los caciques y gente noble, los soldados y la demas gente plebeya, hombres y mugeres. Los caciques dizen: que en muriendo se convierten sus almas en Moscardones y que se quedan en los sepulcros, y de alli salen a ver a sus parientes y se hallan con ellos en las fiestas y las borracheras; y assi, en ellas el primer jarro de chicha que han de beber suelen derramar parte de él o todo para que beban sus caciques y parientes difuntos. Y en sus casas, quando almuerzan y beben el primer jarro de chicha, meten primero el dedo y asperjan (como quando echamos agua bendita) a sus difuntos, diziendo *Pu am*, que es como brindando a las almas, que con esta palabra *am* significan las almas de los diffuntos. Y los hechizeros, en todas las invocaciones que hazen, llaman a las almas de los diffuntos diziendo: *Pu am*; no al Demonio expresamente, que no le conocen, aunque él es el que les habla y les da a entender que es algun de sus diffuntos. Y lo mismo entienden por el Pillan, a quien también invocan, porque los volcanes que ay en este Reyno, que son muchos y echan fuego, humo y azufre, dizen que son algunos de sus caciques diffuntos que habitan en aquellos volcanes y arroxan fuego quando se enojan. Y assi quando invocan al Pillan ni llaman a Dios ni al diablo, sino a sus caciques diffuntos que se han convertido en volcanes: que todos estos herrores les enseña el demonio a los hechizeros, a quienes se aparezc cercado de fuego y en otras varias figuras, ya de niños, ya de paxaros.

Las almas de los indios soldados, que como valerosos mueren en la guerra, dizen que suben a las nubes y se convierten en truenos y relampagos. Y que alla prosiguen con la ocupacion que acatenian de el exercicio de la guerra, y lo mismo disen que les succede a los Españoles que mueren en ella, que suben a las nubes y alla están peleando con los indios. Y a unos y a otros llaman Pillan. Y assi dizen que quando truena y relampaguea, es que pelean en las nubes los Españoles y los Indios y se disparan los unos a los otros rayos de fuego. Y que los Pillanes de los Españoles y de los Indios tienen alla su enemiga, y conservan sus rencores y pelean unos con otros. Y assi en aviendo truenos en las nubes salen de sus casas los indios y arrojan chicha a su Pillan, que entienden que son sus indios valientes y soldados que murieron en la guerra que están peleando con los españoles. Y los hablan y animan diziéndoles que hagan como buen Pillan, valeroso y de presuncion, y que no se degen venzer de el Pillan de el Español, que son los soldados diffuntos, sino que muestren brio y los venzan. Y quando ven que las nubes van hazia sus tierras dan saltos de plazer y palmadas de contento, diziendo que su Pillan lleba de vencido al Pillan de el Español. Y si ven que las nubes van hazia las tierras de los Españoles se entristezen y dizen que los suyos van de vencida, y los reprenden de cobardes y los animan a la pelea. Por esta causa y por la dificultad de llebar a sus tierras los cuerpos de los soldados que mueren en la guerra, los queman y solo lleban sus cenizas, porque dizen que por medio de el fuego y de el humo suben con mas velocidad a las nubes y van convertidas ya en Pillan.

El tercer genero de gente, que es la comun de hombres y mugeres, dizen que en muriendo van sus almas a la otra banda de el mar a comer papas negras. Que fingen unos campos, no Eliseos ni deleitosos, sino que de la otra banda de el mar están unos campos tristes, frios y destemplados, que aunque siembran en ellos no dan sino unas papas negras y que con ellas solas se sustentan, y lo passan con trabaxo; aunque tambien tienen sus fiestas y borracheras las almas de los diffuntos, como aca los vivos, solo que la chicha, que es la bebida de sus fiestas, es negra como de muertos. Carezen en aquellos campos de leña, y para hazer fuego solo ay una muy mala de encender y moxada. Y el que de esta vida no lleba fuego no le tiene alla ni con que calentarse en tan rigurosos frios como alli haze. Y assi para que tenga fuego en la otra vida le hazen encima de la sepultura al diffunto fuego por un año entero. Y demas de eso todos procuran llebar fuego, y para eso se dan votones de fuego en los brazos, que llaman Copen, persuadidos a que con eso tendrán fuego con que calentarse en la otra vida, y que si assi no le lleban alla no le hallarán. Sobre lo qual tienen varias observancias y ficciones de que haré mencion en el tercer tomo.

Rosales 1877:172-173:

Los indios que habitan en medio de el mar en las islas de Santa Maria y la Mocha, con estas ligeras embarcaciones de magüei atrabiesan el mar y van y vienen a tierra firme con sus casas y bastimentos, y en ellas passan sus ganadas, caballos, atados de pies y manos, y bueyes y bacas, sin hazer caso de las hondas del mar, aunque a los indios de la Mocha, por ser aquel mar proceloso, les ha costado muchas vidas el despreciar sus hondas y no aguardar a tiempo mas sereno.

Están en la Mocha algunos trescientos indios infieles, y por el mes de marzo, en que los vientos no son tan fuertes, passan a Firva, que es tierra firme de enemigos, y con ellos comercian, y para atrabesár cinco leguas de mar hazen valsas muy grandes de magüeyes, en que passan treinta personas y trahen muchos carneros y otras cosas con que comerciar. Y estos años pasados han traido mucho ambar que daba en sus costas y no le conocian antes ni hazian caso de el, hasta que los Españoles se le dieron a conocer. Vienen cantando al son de los remos ciertas canciones en que piden al mar les dege passar a comerciar prosperamente.

Rosales 1877:288-291:

En frente de la Provincia de Tirua, en 38 grados cabales, se levanta la isla de la Mocha, cuatro leguas apartada de tierra firme; otras tantas se estiende su longitud, y dos y media su mayor latitud. El terreno es muy fertil, y alegre. Repartesse en hermosas llanuras, y vegas que van repechando hasta encumbrarse en la empinada sierra, la cual atraviesa a lo largo de toda la isla, y arroja dulzes y claros arroyuelos, que riegan los valles: dan de beber a los moradores, y producen grandes y crecidas arboledas. Los isleños en los tiempos anteriores llenaban gran número de familias, y apenas llegan ahora a docientos indios de lanza; es mucho de reparar este consumo de gente pues en esta isla cessan todas las causas de menoscabo, que en otras Provincias de tierra firme lamentan. Porque estos jamas han tenido guerra con los Españoles, ni les an servido, ni ocupandose en tarea alguna de trabajo, e industria personal, que siempre han estado en su isla sin españoles. Pero no se puede negar, sino que sus vicios han causado el mayor estrago; porque todo el tiempo, que les sobra de la pesca de anzuelo, y agricultura, lo emplean en comer y beber, y con el calor de la Chicha, se encienden sangrientas discordias, e inextinguibles odios que con el largo derramamiento de sangre crecen cada dia mas.

Embegezense los rencores, y heredan con nuevos motivos, para vengar las pasiones, que las executan con el yerro, o con el veneno cruelissimamente, y tienen sus bandos, que los de una parte del zerro con los de la otra, tienen sus guerrillas trabadas. Y también se exercitan en el arte magica, y en las hechizerias, comunicando con el demonio, y transformandose aparentemente en raposas, perros, leones, lobos marinos, y otros animales de horrible ferocidad. Corresponde el maligno espíritu mostrandoseles en otras figuras semexantes. Algunas vezes se viste de la figura humana, y tomandoles cuenta de su proceder les castiga con tal severidad, que mueren miserablemente. El mayor delito, de que les haze cargo, es el trato con Christianos, que por alli suelen passar en sus navios, y les reprehende porque conservan las cruzes, que los christianos, que por alli han pasado, les han puesto, y que reciban de ellos rosarios, ni medallas, que ninguna de estas cosas, quiere el enemigo, que tengan. Y por no aver entrado hasta ahora Religiosos, ni predicadores en aquella isla, se estan en su infidelidad, y sugecion al demonio. Y quando los Padres que han ido a Chiloé y a otras partes han pasado por alli y les han predicado los misterios de nuestra Santa Fee, los han oído con gusto y con muestras de desear tener religiosos que los prediquen y saquen de sus errores. Y fuera alli de gran servicio de Nuestro Señor una mision, pero hasta ahora no se ha llegado su tiempo.

Pero volviendo a la fertilidad de la tierra, es grandissima: y cogen copiosamente maiz, y legumbres; y trigo y cebada con moderacion; porque siembran poco de eso, que lo que mas estiman es el maiz, para chicha. Que si pusieran cuidado en sembrar trigo, fueran prodigiosas las cosechas. Crian cantidad de gallinas, ovejas castellanas, y chilenas, que crezen, y engordan a maravilla, y tienen trato de ellas con los Indios de Tirua y tierra firme. Solian tener bacas, y por ser la isla corta, y en semejantes estrechuras, perjudiciales a las sementeras, las mataron. Tienen pocos caballos, y solo les sirven de reconocer la isla, y para alguna regocijo. No ay puerto, ni surtidero, evento de la braveza del Aquilon. Y aunque algunas vezes los navios, que van a Chiloe, y otras partes dan fondo en el mar, es con buen tiempo y muy de paseo. Siempre hallan en los indios cumplidissimo agasajo, y regalo de aves, carneros, papas, y maiz. Y se contentan con un pequeño retorno de cascabeles, peines, cuchillos, añil, cuentas de vidrio y cosas deste porte. Comercian con los de tierra, y Paicabi por carneros y obejas de la tierra, y lumas para cabar, las cosas que los indios de tierra firme adquieren de los Españoles, como hachas de yerro, cuñas, añil, cuentas de vidrio, y cosas assi.

El primer pirata deste mar Antartico, Francisco Draque, ingles, aportó a esta isla a veinte y nueve de Noviembre de 1578. Al principio fué recevido con mucho cariño y agasajo, y a los fines se convirtió en llanto la fiesta que le hizieron, porque les mataron algunos soldados en castigo ile que licenciosamente quisieron perder el respeto a sus mugeres, y por poco les cogieran una barca que hazia aguada.

El autor de la historia desta navegacion, tratando destos de la Mocha, dize: "Que huyendo la tirania y ferocidad de los Españoles, se condenaron a perpetua relegacion de su patria y vagando fugitivos por varios paises se acogieron al asilo de las islas." Assi lo refiere Theodoro Bry, del diario de aquella navegacion, y engañóse gravissimamente el que le hizo y puso de su cabeza el dezir que se acogieron a essa huyendo de la tirania de los Españoles, porque antes que los Españoles viniessen a Chile tenian los indios poblada essa isla, que no cabiendo en tierra firme se pasaron a ella. Y nunca han tenido guerra con ellos los españoles desde que poblaron este lleyno, ni les an tocado a un pelo, y si los españoles intentaran oprimirlos mas facilmente lo hubieran hecho que a otros indios, por tener a essos en una caxa cerrada y en una isla corta que no tienen donde esconderse, ni por donde huir, ni ayuda de los enemigos rebeldes. Antes los han acariciado, y los Gobernadores les an dado salvo conducto para que vivan con toda seguridad y no han consentido.que los saquen de su isla, aunque muchos lo an intentado, por no desnaturalizarlos: de donde se ve claro que no son fujitivos ni naturales de otras tierras, que a serlo, los mismos indios de tierra firme los hubieran obligado a que viniessen a ayudarlos a hazer la guerra, viéndose tan faltos de gente por la mucha que se ha consumido con ella.

No esperimentó mas benevolo hospedage la armada de Thomas Candisch, ingles, que por Marzo de 1587 echó en esta isla una escuadra de soldados y a casi todos los degollaron. Mayor infortunio sintió una nave de la infeliz armada de Simon Cordes, que despues de averles llenado de bastimentos y festexado a los holandeses con publicos regocixos, les echaron una emboscada y les mataron setenta hombres en ella, y les cogieron la barca y quanto en ella encontraron, y hasta oy conserva un Cacique muy principal, llamado Quechumilla, un pito de plata grande y curioso que le heredó de su padre, que fué autor y caudillo de aquella emboscada, y nunca le ha querido enagenar porque sirva de memoria a la posteridad para no olvidar sus triunfos. Este tan infausto suceso callan los ingleses, como otras muchas cosas calamitosas, sin quererlas poner en sus diarios nauticos, y lo mismo hazen los holandeses por no infundir pabor ni espanto a los que emprenden las navegaciones australes.

Varias vezes a pedido al Rey la ciudad de la Serena que en consideracion de que por falta de indios se ba menoscabando y no ay quien labre y beneficie las minas de oro y plata que alli están registradas, mande despoblar la Mocha y trasladar sus indios a los campos y estancias de Coquimbo, donde podrán ser bien instruidos en la ley Evangelica y costumbres politicas. Pero el Rey ha respondido con aquella perfectissima justificacion que suele, que el Presidente y Oydores desta Real Audiencia le informen, no de las conveniencias de la ciudad de la Serena o Coquimbo, sino de los inconvenientes que se ofrecen para que no perseveren los indios en su patrio suelo.

Los Gobernadores han conferido el caso con muchos y muy doctos theologos y juristas y siempre ha sido la resolucion en favor de los indios, pues teniendo, como tienen, dominio y posesion inmemorial de la isla, y el Paganismo no es titulo suficiente y adequado para justificar la relegacion y despojo, puesto que el temporal dominio se funda en el libre arbitrio y derecho de las gentes y no en la fee y religion y por titulo y piedad de quererles instruir en ella, no se les debe despojar de sus tierras, como lo dize doctamente el Cardenal Belarmino en el libro quinto de la Potestad Pontificia, por estas palabras: "Dominium non fundatur in gratia, et Fide, sed in libero arbitrio, et ratione; neque descendit ex iure divino; sed ex iure gentium."

Y en el viejo y nuevo Testamento se aprueba y confirma el Reyno y principado de los Gentiles, porque a Nabucodonosor le entregó Dios el imperio y monarquia de los caldeos, que aunque mudó cabezas la corona perseveró siempre en ydolatras y paganos. Y Christo Señor Nuestro declaró por justo el tributo que se le debia a Tiberio Cesar por el señorío y dominio que avian adquirido los romanos. Ademas, que a estos indios ni los ministros Evangelicos les han publicado la ley divina, sino de passo, quando a tocado alli algun navio, y siempre han mostrado voluntad de recebirla, ni los ministros del Rey les han notificado los reales mandatos, requiriéndolos y pidiéndoles bassallage, sino que les an permitido vivir libremente. Y yo he visto venir algunas vezes a sus caciques a la Concepcion a dar la obediencia al Gobernador y pedirle papeles para que los navios que por su tierra passaren los traten como amigos y vasallos del Rey y no les agan mal ninguno, que ellos prometen hazer a todos buen passage. Con que no los pueden argüir de contumazes en la gentilidad ni de rebeldes contra el Real dominio, y mucho menos de coligacion y alianza con los enemigos extrangeros de Europa, como se ha visto en los sucesos referidos. Ni tampoco se han coligado con los indios rebeldes de Tirua y Paicabi, porque no les han dado jamas soldados ni lanzas, como algunos les imponian, ni se les ha averiguado mas de que de año en año vienen en sus balsas a feriar y contratar con ellos carneros y cosas de sus frutos. Ni en el alzamiento general del año de 1655 dieron armas ni ayuda a los de tierra firme; antes, aviendo los de Tirua embiado a la isla, de la Mocha al Capitan Baltazar Quijada, que captivaron en Arauco, como arriba dixe, por engaño, rezelosos de que no se les fuesse y para asegurarle en medio del mar, los caciques de la Mocha le hizieron mucho agasajo y no le trataron como captivo sino con mucha honra, y en la primera ocasion que hubo de navio que passó por alli le digeron que se fuesse a los Españoles, y le embiaron libre, sin rezelo del sentimiento que avian de hazer los rebeldes de Tirua, que le avian embiado a depositar y guardar en aquella isla y les avian embiado a dezir que le matasen.

No convencen las conveniencias de la ciudad de la Serena, pues la justicia conmutativa que deben guardar los principes a los vasallos no a de mirar por la conservacion de unos con la destruccion de los otros, sino proporcionar los medios al bien universal de todos.

El Governador D. Martin de Moxica, digno de eterna memoria, determinó fabricar un fuerte en la parte mas aproposito de la isla, con guarnicion de cincuenta soldados y dos padres misioneros de la Compañia de Jesus, para que unos y otros atendiessen a la conversion de aquellas almas, y de paso sembrassen para ayuda del sustento del nuevo presidio de Valdivia, y sin duda que lo hubiera executado, segun era su gran zelo de la conversion de los infieles y su exaccion en las execuciones, si la temprana y repentina muerte no le arrebatara en los principios de su feliz gobierno. Gran luz se apagó en este Reyno con su muerte: alumbró su prudencia como estrella y feneció como relampago su vida.

El Governador D. Juan Enriquez tuvo muchos deseos de enviarme a esta mision, y yo los tube mayores de ir a convertir aquellas desamparadas almas, y por falta de un varco, que no ay puerto para navio, nunca tubo effecto. Y el Iltrmo. Obispo de la Imperial, D. Fray Francisco de Vergara y Loyola, quiso tocar en esa isla de la Mocha y predicarles el Santo Evangelio a sus naturales, passando por ella de visitar a Valdivia, y aunque el navio se puso a la capa no le dió lugar a saltar en tierra la furia de los vientos y la falta de un puerto, y desde la conquista de este Reyno se están sin doctrina.

Rosales 1878:110:

A la mañana, echándolos menos, salió Lasarte con doze soldados de a caballo y siguiendo a los indios por el rastro salió a lo alto de la Caramavida y bajó a Pilmaiquen, y al retirare, los indios le hizieron rostro y le mataron, y a tres soldados con él. Cogieron vivo a un valiente soldado llamado Rebolledo y le desterraron a la isla de la Mocha, donde se hará mencion en otro lugar de él.

Rosales 1878:135:

Fué comprado Rebolledo, assi atado y herido como le captivaron en la batalla, por uno de los diez caciques de la isla de la Mocha por precio de dos ovejas y una piedra de sal, que tan baratos como esto se venden los españoles entre los chilenos para servir como esclavos. El isleño cacique le trató humanamente y le quitó las prisiones, dándole libertad para hazer lo que quisiesse, aunque le tenia debaxo de su dominio. Rebolledo se entretenia en pescar y cazar palomas torcazes, con que regalaba a su amo, y lo demas del tiempo le gastaba en oracion y devociones, pidiendo a Dios le sacasse de entre aquellos barbaros de costumbres tan contrarias a los christianos. Oyóle Dios, porque dentro de poco tiempo passó por alli un navio, y dando vozes y diciendo: Christianos, christianos; sacad por amor de Dios de captiverio a un christiano que aqui está! echaron el barco y trataron con el cacique su amo del rescate; mas él no le quiso dar por ningun precio por la voluntad que le avia cobrado. Rebolledo tubo traza para dezir en cifra que se fuessen y que volviessen a media noche a una punta donde viessen fuego, que alli estaria él y le podrian llebar. Sospechó un yanacona ladino llamado Lucas (que alli estaba y avia muchas vezes persuadido a los indios que matassen aquel español) que se queria huir, y para saber el intento y hazerle matar, llegóse a él, y fingiéndose descontento entre aquellos barbaros, le dixo que se huyessen los dos y que diessen traza como ponerlo en execucion. Mas Rebolledo conoció el lanze y disimulando su intento le dixo que él se hallaba alli muy bien y estaba obligado del buen tratamiento de su amo; que se huyesse él, si le pareciesse; con que le dejó, y haziendo fuego a media noche vino el barco y le sacó de captiverio, con grande gozo suyo y de los españoles, que gustaron mucho de oyrle las historias que en su captiverio le avian passado, que dexo, refiriendo solamente su vida y su salida para exemplo de captivos, porque no se den al vicio de los indios, sino a Dios como christianos, esperando en él, que no desampara a los que invocan su fabor, y para que sean cautos en no descubrir su secreto, que le fué la vida en saberle encubrir este captivo.

Rosales 1991*:78-79:

De otra santa industria usó el Apostólico P. para mover aquellos corazones ~~duros y ablándandzzose que fue muy eficaz~~ que fue mostrarles, cuando se juntaban en la Iglesia, y en sus fiestas ~~y caguines~~ donde todos concurren, dos imágenes: una del alma gloriosa, y otra del alma condenada explicándoles la felicidad de la una, y la atrocidad de los tormentos de la otra. Decíales que escogiesen, el estar como la una, o como la otra: que se desengañasen, que las almas no iban, como ellos pensaban a la otra banda del mar a comer papas negras y beber chicha negra; que eso les hacía creer el demonio: que no había para las almas; sino gloria eterna en el cielo, o pena eterna en el infierno.

* The 1991 transcription includes lines originally striked out in Rosales' 17th century manuscript. I have included them in the same style.

Rosales 1991:87-91:

Visitando el P. la Provincia de Tirua, que está en la costa del mar, y doctrinando aquellos Indios, llegaron dos Caciques de la isla de la Mocha en unas balsas de paja, con mucha gente, que venían a sus tratos y contratos, ~~con los indios de tierra firme de Tirua,~~ y pareciéndole al P. buena ocasión, para darles noticia del verdadero Dios a aquellos isleños, que están en una isla seis leguas apartadas de tierra firme, y nunca ven un sacerdote, ni hasta ahora han tenido quien los doctrine, por falta de embarcación, y ser el mar muy tempestuoso. Y se detuvo allí muchos días. Y enviándolos a llamar, vinieron con sumo gusto y rendimiento los dos caciques Queupuante y Maricheu, que habían venido, trayendo toda su gente, a quienes predicó el P. ~~y dio noticias del Santo Evangelio~~, y les mandó, que el tiempo que allí estuviesen, acudiesen a la doctrina, para llevar a su tierra las noticias del Santo Evangelio. Lo cual cumplieron con mucha voluntad, que es gente de buen natural, y le lastimaba al P., que no tuviesen en sus tierras algún P. que se había de hacer en ellos una buena Christiandad. Y cuando estos caciques veían que los de Tirua tenían Padres, que los enseñasen el camino del cielo, y oían la dulzura de las palabras del P. tenían una santa Invidia y le decían: Ah P.! si te tuviéramos en nuestra isla, que dichosos fuéramos, y como los convirtieras a todos, y los hicieras buenos cristianos, que son muy humildes, y de buenos naturales, no como éstos que estás doctrinando, que son soberbios, altivos enemigos de los cristianos, y cebados en la guerra y en la sangre de los españoles. Dábales el P. buenas esperanzas: de que Dios se compadecería de ello, y daría oportunidad y embarcaciones, para que pudiesen ir los Padres a doctrinarlos, que les tenían lástima de ver que se perdiesen sus almas, y deseaban ir a asistirlos. Dióles el P. cuando se hubieron de ir algunas cosillas de su agrado, y encargóles que se acordasen de Dios, y de las cosas que habían oído, y las contasen a sus vasallos; y al cabo de algunos días se embarcaron en sus balsas de paja, en una callada, que siempre esperan que el mar esté sereno. Pero a las doce del día se levantó un sur tan furioso, que se quería tragar al pajizo batelillo, y dejándose llevar de su ceño por esos mares, anduvo tres días batallando con las ondas, hasta tomar puerto con pérdida de solas dos personas: una de hambre y frío pereció en la mar, y el cacique Maricheuque, que maltratado de las olas, y de los vientos, luego, que llegó a tierra dio las últimas bocanadas, con grande sentimiento de los suyos, y del P. cuando lo supo. Y esta es la causa porque hasta ahora no han ido los Padres a esta Misión. Por no haber barco, sino unas balsas de paja, que de ordinario peligran muchos en ellas, y todos van con el agua hasta la rodilla, y la balsa debajo del agua, con grandísimo riesgo.

Envió poco después el Maestro de Campo del Reyno un soldado a esta isla de la Mocha, a sólo que le comprase entre los Indios algún ámbar, que suelen salir en aquella isla; estaba el P. en Tirua, doctrinando los indios, cuando se hubo de embarcar, y compadeciéndose de él, porque se embarcase en tan arriesgada embarcación, y en un mar tan bravo, por fin tan bajo, y deseoso de alumbrar a los indios con la luz del Evangelio, por su medio que sabía muy bien su lengua, le dijo: que ya, que arriesgaba su vida, lo hiciese por Dios, y para fin más alto; que fuese por su embajador a los Indios de aquella isla, y pues sabía bien la lengua, les dijese de su parte, que adorasen a Dios, creador del cielo y tierra, que creyesen en Jesuchristo y guardasen los mandamientos y tuviesen deseo de bautismo y contrición de su pecados, que así podrían salvarse mientras no tenían algún sacerdote, y que de camino hiciese lo que su superior le mandaba, y confiase en Dios, que yendo a causa suya, y con su embajada le libraría de tan manifiesto riesgo de la vida. Agradeció mucho el soldado el buen consejo del celoso Padre, y el oficio, que le había dado, de embajador suyo. Y Dios le llevó con bien, y allá cumplió lo que el P. le ordenó, dio la embajada a todos los indios juntos, que le recibieron con grande gusto, y luego pusieron, no sola una cruz, sino que cuatro en diferentes lugares para adorarlas y reverenciarlas, y acordarse todo lo que el P. le había enviado a decir, para el bien de sus almas. Volvió el soldado con más de cinco o seis onzas de ámbar, que se halló. Pero muy contento de haber arriesgado su vida, por tan principal e importante embajada y por el fruto, que con ella hizo en aquellas almas, dándoles a conocer a su criador. Y decía, que estuviera toda su vida sintiendo, el haberse puesto en tan grande peligro, que era mucho más visto que imaginado, si sólo hubiese ido por un interés tan vil. Pero que por el bien que había hecho a aquellos Indios, estaría toda su vida muy gozoso, y confiando en Dios, que se lo había de galardonar muy abundantemente, ~~al paso que había de desagradecer al Maestro de Campo la diligencia porque esperaba un grande interés, y el que había de quedar agradecido al P., por haberle dado ocasión de interesar tanto con Dios.~~

Sucedió un caso bien particular en esta ocasión, y fue que vinieron dos caciques muy principales, el uno llamado Antupillan y el otro Virculabquen, en dos balsas escoltando al soldado Español, y a sus contratos, y en medio del golfo, los anduvo persiguiendo un Moscardón de balsa en balsa, con importunos zumbidos, cosa desusada en el mar. Entraron en grande cuidado. Porque los Indios son grandes agoreros, y al moscardón le tienen por algún alma de la otra vida. Y tan asentado eso que si estando uno enfermo, entran moscardones en su rancho, luego le lloran por muerto, y dicen, que son almas de sus parientes, que viene por él, ~~que morirá sin nada. Y a veces sale verdad. Por que los moscardones huelen los cuerpos muertos, y de los moribundos, y acuden al olor~~. Y cuando acuden a las borracheras, porque hay carne muerta, dicen, que son, los parientes, que viene también a holgarse y a beber, y les echan chicha. Con este cuidado y estas abusiones [sic] estuvieron muy atentos, para ver, donde se asentaba, y habiéndose asentado después de muchas vueltas, sobre el hombro de un Indio sujeto al cacique Antupillan, levantaron figura, y dijeron todos que aquel indio había de morir ~~que el alma de algún pariente suyo venía por él~~. Navegaron con tiempo favorable, y al llegar al Río Salado, donde suelen tomar puerto, trastórnose la balsa del Cacique Antupillán, y saliendo todos salvos a la orilla aquél indio sólo peligró, y salió ya boqueando, que por mucha diligencia, que hizo el Soldado, para ver si le podía bautizar, no pudo. Con este caso, se confirmaban los Indios en sus agueros, y en su creencia porque aunque el P. les decía: que era cosa natural el acudir los Moscardones, como también las moscas a la carne muerta, y a los cuerpos de los moribundos, que ya se comienzan a corromper y los huelen. Y que no eran aquellas las almas de sus parientes que esas estaban, en el cielo o en el infierno y de allí no hay salida. Respondían: Bien estamos con eso. Pero a este Indio, que estaba tan bueno y tan sano, como nosotros, como olió el Moscardón, que él había de morir? ~~y no alguno de nosotros~~ y se asentó sobre él, y no sobre los demás? El P. les daba entender como el demonio, haciendo a todas manos los engañaba, que las almas de sus parientes estaban condenadas en el infierno, por haber muerto infieles, y no salían de allá, que tratasen ellos de ser Cristhianos, para no ir allá.

Con otros muchos errores engañaba el Demonio a los miserables isleños, y ellos engañan ~~con ellos~~ a los de tierra firme, y se los vienen a contar, para tener buena cabida, ~~y buen agasajo~~ entre ellos. Y el siervo de Dios trabajaba por disuadir a los unos y a los otros de semejantes errores, que juntan con la inmortalidad del alma: que si bien creen que no muere, estos bárbaros de la Mocha les vienen a contar: que junto a su isla grande, hay una muy pequeña, inhabitable, y que por ella pasan las almas de los muertos a la otra banda de el mar a comer papas negras, y allí es el embarcadero para el mar negro. Y entrando la noche, se ven horribles visiones, y formidables apariencias, y entre ellas se oyen grandes aullidos y voces lastimosas, de los que se embarcan despidiéndose de ellos, y que por las voces, conocen los que son, y las personas que se han muerto en tierra firme y tienen grande pena, por saber, que se les han muerto sus parientes, y amigos ~~y sus hermanos de tierra firme, que como~~ (illegible). Y para persuadir mejor estos embustes ~~y hacerlos más creibles~~, en saltando a tierra se informan de que personas han muerto, hombres, mujeres y niños, y con aquella noticia, en las juntas, donde platican estas cosas, Preguntan: no murió fulano?; que allá oimos sus voces y lamentos, conque se despedía de nosotros y de este mundo. Y fulano no falleció ya? Y así iban refiriendo los muertos, y como era así, que habían muerto creían también que era así, que en aquella isla se embarcaban ~~para el mar negro~~ y para la otra banda del mar, donde estaban las almas. Y estimaban mucho a los que les daban noticias de ellas, y por esta vía de falsa revelación, se hacían estimados, y tenían gran introducción; porque cada uno quería saber del estado del alma de su hijo, de su hermano o pariente, y se iba a informar de ellos. Con lo cual los regalaban en todas partes, y si se detenían algún año, que no les dejaban los temporales embarcar, los sustentaban todo el año, y les hacían grande lugar en las fiestas, como les aconteció aquel año.

- Geronimo de Quiroga (1685)

Quiroga 1979:24:

Los indios isleños son universalmente más dóciles y de blando natural, como los de la Isla de Santa María, la Mocha y el Archipiélago de Chiloé; los de Santa María han sido y son mitayos de las faenas del ejército para los barcos que en él sirven; los de la Mocha hasta estos años fueron incógnitos, porque ni nos vieron, ni los veíamos, pero ya se transportaton todos a la tierra firme en el presente Gobierno de don José de Garro, con grande acierto y feliz fortuna, pues pasaron en canastos de totora un golfo de 12 leguas todas las familias, sin pérdida ninguna; y están cristianos todos, dos leguas de la Concepción, con beneficio común de esta república.

Quiroga 1979:460:

Despoblé la isla de la Mocha porque el pirata inglés no sacase de allí bastimentos y llevase la gente para poblar alguna factoría y fortificarse. Fueron 800 almas y fue Dios servido que no se ahogase ninguno, habiendo atravesado 12 leguas de golfo tormentoso en unas balsas de totora, y las reduje a esta parte de Bío-Bío, 2 leguas de la Concepción, donde hoy están con su Iglesia y misioneros

- George Davis (1686-1687)

Wafer 1903:179-181:

Going off therefore from John Fernando's, we stood yet further South in going over to the Continent, to the Latitude of 39 S. as well to gain a Wind as to have the more of the Coast before us. We fell in first with the Island of Mocha, which lies in about 38 Deg. 20 Min. S. and wanting Water and Provision we came to an Anchor, and put ashore there, about the middle of

December, 1686. and stay'd 5 or 6 Days. Here we were very well relieved, for the Island afforded both Water and fresh Provision for our Men, all the time we stay'd. The Land is very low and flat, and upon the Seacoast sandy; but the middle Ground is good Mould, and produces Maiz and other Wheat, Barly, with variety of Fruits, &c. Here were several Houses belonging to the Spanish Indians, which were very well stored with Dunghil-Fowl. They have here also several Horses: But that which is most worthy of Note, is a sort of Sheep they have, which the Inhabitants call Cornera de Terra. This Creature is about four Foot and an half high at the Back, and a very stately Beast. These Sheep are so Tame, that we frequently used to bridle one of them, upon whose Back two of the lustiest Men would ride at once round the Island, to drive the rest to the Fold. His ordinary Pace is either an Amble or a good Hand-gallop; nor does he care for going any other Pace, during the time his Rider is upon his Back. His Mouth is like that of a Hare; and the Hair-lip above opens as well as the Main-lips, when he bites the Grass, which he does very near. His Head is much like an Antelope, but they had no Horns when we were there; yet we found very large Horns, much twisted, in the form of a Snail-shell, which we suppos'd they had shed: They lay many of them scattering upon the Sandy-bays. His Ears resemble those of an Ass, his Neck small, and resembling a Cammels. He carries his Head bending, and very stately, like a Swan; is fullchested like a Horse, and has his Loyns much like a well-shap'd Grey-hound. His Buttocks resemble those of a full-grown Deer, and he has much such a Tail. He is Cloven-footed like a Sheep, but on the inside [200] of each Foot has a large Claw, bigger than ones Finger, but sharp and resembling those of an Eagle. These Claws stand about two Inches above the Division of the Hoof; and they serve him in climbing Rocks, holding fast by whatever they bear against. His Flesh eats as like Mutton as can be: He bears Wool of 12 or 14 Inches long upon the Belly; but 'tis shorter on the Back, shaggy, and but inclining to a Curl. "Tis an innocent and very serviceable Beast, fit for any Drudgery. Of these we killed forty three; out of the Maw of one of which I took thirteen *Bezoar*-stones, of which some were ragged, and of severl Forms; some long, resembling Coral; some round, and some oval; but all Green when taken out of the Maw: Yet by long keeping they turn'd of an Ash-colour; and I have some of them now by me.

The Spaniards told us, That these Creatures are extraordinarily serviceable to them at the Mines of Potosi, (which lie a great way up in the Country) in bringing the Silver from thence to the Cities that lie toward [201] the Sea; between which Cities and the Mines are such cragged Ways and dangerous Precipices, that it were almost impossible for any Man, or any other Beast to carry it. But these Sheep being laden, and led to the Precipices, their Master leaves them there to themselves for above sixteen Leagues; and never meets them, till he himself has also fetch'd a Compass about 57 Leagues round. This their sureness of Foot consists solely in their aforesaid Claws, by which they hold themselves so fast upon the least Footing, that they can go where no other Beast can.

Wafer 1903:191-192:

When we were again arriv'd at John Fernando's, which was at the latter End of the laid waste; Year, 1687. we clean'd our Ship there, having quitted our Bark, and stood over to the Main; intending to get some of the Sheep of Mocha, for our Voyage round Terra del Fuego. But when we came there, the Spaniards had wholly destroyed or carried away the Sheep, Horses, and all other living Creatures. We went then to Santa Maria, an Island in 37 Deg. S. in expectation of fresh Provision; but this Island was likewise destroy'd: So we were forc'd to content our selves with such Provision as we had brought from the Gallapago's; which were chiefly Flower, Maiz, Hecatee or Land-Tortoise salted, and the Fat of it tried, or made into Lard or Oil, of which we got there 60 Jars. The Spaniards had set Dogs ashore at John Fernando's also, to destroy the Goats there, that we might fail of Provision: But we were content with killing there no more than we eat presently; not doubting but we should have found Sheep enough at Mocha, to victual the Ship.

Burney 1816:192-193:

The luckless residue, consisting of sixty Englishmen, and twenty Frenchmen, with Edward Davis at their head, remained with the Batchelor's Delight to begin their work afresh. They sailed from Juan Fernandez for the American coast, which they made as far South as the Island Mocha. By traffic with the inhabitants they procured among other provisions, a number of Llama or Peruvian sheep. Wafer relates, that out of the stomach of one of these sheep he took thirteen Bezoar stones of several forms, 'some resembling coral, some round, and all ' green when first taken out; but by long keeping they turned 'of an ash colour'

Burney 1816:210:

From Juan Fernandez, Davis sailed to the Islands Mocha and Santa Maria, near the Continent, where he expected to have procured provisions, but he found both those Islands deserted and laid waste, the Spaniards having obliged the inhabitants to remove, that the Buccaneers might not obtain supply there.

- John Strong (1690)

Burney 1816:333:

June the 10th, Strong arrived at the Island Mocha. He remarks, ' There is much broken ground on the West side of this Island, and at the SW end is a reef of rocks that lies six miles off to sea.' He landed, and found the Island without inhabitants. Horses, dogs, and the ruins of two deserted towns were seen, and turnips were growing in abundance.

- Jacob Roggeveen (1722)

Roggeveen 1970:75-78:

February 15 Had the wind in the morning from the south, with reefed topsail's breeze, misty weather, and a hollow sea from the south-south-west. In the 5th glass of the morning watch, saw a high surf in the north by west from us, and also at the same time a point of land in the north by east, which we thought to be the Island La Mocha. Turned then to the east ,and steered our course gradually from east to the north by west. Had the depth of 17 to 11½ fathom, the bottom being as above, and lying on the east side of the island about a half mile from the shore, the south point bearing south by west ½ west, and the north point north-north-west from us.

February 16 Pit out our boat, it being outstandingly good weather and calm, then sent our slopp with the boat of the Africaansche Galey to investigate whether they could find anywhere a suitable place where it was possible to land with safety and engage in conversations with Spaniards or Indians for the purpose of doing some trading with them. But our envoys returning, reported that it was impracticable to land, because of the great surf and the covered rocks which stretched along the coast, unless boat and sloop were put in the greatest danger. Therefore, if we wanted to be on the shore, it would be necessary to wait for good weather and calm, so that the surf should thereby have time to become smooth, since on the preceding days it had been blowing strongly. Further it was reported to us that they had seen an innumerable multitude of horses, cows, sheep and goats, but no people. About noon we steered our boat with that of de Africaansche Galey to the north point of the island, to see if the instruction given could be carried out there. The boats coming back towards dusk, their report was as before, namely, that they had not seen or spoken to any people, nor had been able to land, but that the island was full of every sort of cattle.

February 17 The wind was south-west, also south, topgallantsail's breeze, calm, thick rainy weather with thunder and lightning. In the 4th glass of the day watch we sent our sloop to the shore, to see whether the strong surf still continued; which having rowed away and come back, it was reported that it was suitable to land. Thereupon at once both the boats and our sloop were manned properly, and each man armed with a musket and broadsword, being instructed to do everything in an orderly and peaceable manner, and not to use their weapons unless they were hostilely attacked, and so to withstand force with force. Our men going ashore, we saw from our ship that they marched to the north point of the island, and losing them from sight, had to await their return with patience; this desire having lasted till sunset, we again saw our people, but at the south point of the island, from which we concluded that they had gone round the circumference, or at least a great part of it. But as we did not get the boats or sloop alongside, and being ignorant of the reason for this, we gave in the first glass of the first watch a signal-shot, whereupon the Quartermaster came alongside with the sloop, saying to us that all the people had returned to the beach near the boats, but impracticable to transport them with the sloop into the boats, which lay with grapnels outside the surf. Whereupon it was ordered that the boats should come alongside, so as not to remain lying in any danger there during the night. Also the Quartermaster could not give us the least account of what had happened on shore, because the roar of the sea against the beach caused such a great din and noise that they had not been able to call to one another with understandable words. I must add here that in the afternoon such a flight of ducks crossed over from the main coast to this island that its number cannot be given a limit, for its breadth was very extensive along the water, and its length a full mile.

February 18 After we had at daybreak sent off our boats and sloop to bring our people on board, they all returned in the 4th glass of the day watch, reporting that on the island there is not a single human being, that everything lies waste, and what previously seemed to be cows, calves, sheep and goats were only horses and young colts, also that they had seen 3 to 4 wild dogs; but that although everything appeared to them barren and waste, they nevertheless resolved, in order to fully to be informed by ocular inspection, to traverse the whole circumference of the island, but their investigation had found nothing but a sad sight of a wrecked ship, some pieces of which having been cast on the beach by the sea, it was considered that it was of French make. Now the reason why the Spaniards have been moved to lay this island completely waste (which in former times was very fertile, according to the testimony of the journals of the Nassau Fleet, Joris van Spilbergen, and others) is according to all likelihood this: that the English or pirates usually came to this island to obtain and take in refreshment and victuals, either by force or exchange and barter, because the great number of men whom they carried caused all the time (according to their own journals) lack of provisions;

then when they had got what they needed at La Mocha they were again put into a position to carry out their pillaging. This venture of ours thus having turned out bad and unsuccessful, we resolved at once to continue our voyage to the Island of Jan Ferdinando. Therefore raised our anchors, and set out under sail about the 3rd glass of the morning watch. The wind with a very light breeze was from the south. At sunset took the bearing of the island south by east 6 miles from us, and the visible northernmost land of Chile north-north-east, at a distance of 7 miles. Our north-east variation, according to the finding of an evening bearing, was 9 degrees 4 minutes.

Burney 1816: 559:

The Arens and the African Galley sailed through Strait le Maire, and on March the 10th, anchored at the Isle of Mocha. This Island they found without inhabitants, other than horses and dogs. From Mocha they sailed to the island of Juan Fernandez.

- Miguel de Olivares (1738)

Olivares 1874:88:

Los indios que ya son adultos o casados con muchas mujeres, segun su usanza que es su mayor grandeza i estimacion, por no dejarlas, no se quieren bautizar porque pierden las pagas que dieron por ellas, pues una mujer del indio es como su criada, a quien compran para servirse de ella, en que le haga la chicha, guise de comeri le teja los ponchos. I sin estas indias o mujeres viven pobres, o como dicen ellos, *reche* esto es indio solo. Esta es la mayor dificultad que ha habido para la conversion de estos indios. Pues todas las demas se hubiesen vencido, como son la repugnancia que tenían de enterrarse en las iglesias o capillas, hechos a ser enterrados en campaña a donde les ponen chicha, comida i todos sus vestidos i avío del caballo, creyendo que van a la otra banda del mar a vivir, como ellos dicen, *carculafquen*, que es de la otra banda del mar o laguna, porque *laguen* significa mar o laguna, que parece que el diablo les ha querido introducir la creencia de la laguna Estijia, i aquello que les ponen es, dicen para que les den buen pasaje; como tambien el no querer tener capilla donde juntarse a oir la doctrina, porque como en las iglesias se entierran los muertos, la llaman *ruca alue*, casa de muertos.

- Pedro de Cordoba y Figueroa (1739)

Cordoba y Figueroa 1862:120-121:

Adonde no vive el recelo, alli acude el peligro, y siempre fué mejor adolecer de prevenido. En la isla de la Mocha, que está inmediata a la costa de Arauco, experimentó esta perfidia un español, de aquellos insulares, pues habiendose quedado entre ellos para su espiritual y temporal beneficio, atraido de sus ofertas y finjidas súplicas, porque es de los aleves y traidores tener buenas palabras, como dice Marco Aurelio. Por fin, quitáronle la vida atrozmente cuando discurrió mas segura su confianza: no nos individualizan mas las memorias de aquel tiempo. El gobernador, viendo que aquella omision del castigo traeria consecuencias perjudiciales al público interes, destacó a Pedro de Villagra, su primo, con sesenta hombres para que castigase aquellos isleños; mas hallólos resueltos y bien prevenidos a una vigorosa defensa y vinieron a atacar a los españoles. La accion fué dudosa y en ella perdió Villagra tíos hombres, y habiéndose retirado, procuraron siempre alejarse, viendo que no podian subsistir mucho tiempo en su pais, lo que acaeció volviéndose a Arauco en la misma embarcacion que fueron.

Cordoba y Figueroa 1862:306:

Mandó el Rei que se despoblase la isla de la Mocha, que está situada entre treinta y ocho a treinta y nueve grados en derechura del desemboque del rio de la Imperial y a moderada distancia de tierra firme, porque estando cultivada y habitada pudiera cualquiera nacion de Europa, émula de la española y deseosa de disfrutar intereses en Indias, acimentarse en ella: extrajéronse ochocientas personas de ambos sexos y se establecieron cuatro leguas de la Concepcion, mision que hoi permanece a cargo de los padres de la Compañia de Jesus, cómoda y decente, bien asistidos de su fervoroso celo los pocos que permanecen; y el gobierno se manifestó con ellos caritativo y liberal, y por recordacion suya se le puso San José de la Mocha.

- Miguel de Olivares (1758-1767)

Olivares 1864:52:

Creen en la inmortalidad del alma; pero esta creencia está desfigurada con groseros errores: no piensan que haya lugar separado en que se paguen con el premio o castigo las buenas obras o malas, sino que vengan a la isla de la Mocha a pasar otra vida sin fin ni trabajo y alimentados de pagas negras. Sus parientes les echan en el sepulcro cosa de comer y de beber, para provision de su viaje que como han de hacerlo caballeros sobre la espalda de una ballena como creian otros jentiles mas avisados, que solo podian pasar los estanques perezosos del Cosito por medio de la barca y ministerio del barquero Caronte, y como la ficcion griega añadia que a éste se le pagaba cierta moneda por el portasgo, los indios no han quedado atras y aseguran que en un paraje estrecho ántes de llegar al lugar destinado a los difuntos, hai una vieja a la cual se le debe pagar alguna cosa como recaudadora de la aduana ; y dicen que es una perversa vieja, porque sino la satisfacen en moneda o en especie, se hace pago con uno de los ojos del pasajero.

- Andres Febres (1765)

Febres 1765:497-498:

Gull, *gullhue-* la parte occidental, donde se pone el sol

Gullantù- entre las cuatro ó cinco de la tarde.

Gullerùv, *gullhuecrùv*- el viento Oeste, ó travesía

Gulln- ponerse el sol: hinc *gullchemayhue*- el poniente, y el lugar donde dizen van à parar sus almas, que es la Isla de la Mocha, y *gullchenman*- es ir à parar alla, ò morirse.

Febres 1765:643:

Thempùlcahue- dicen por burla á las viejas, y fingen que quando uno muere, viene una de éllas en figura de ballena á llevar el alma á la otra banda del mar, esto es, á la isla de la mocha.

- Cosme Bueno (1777)

Bueno 1876:310:

Hai señales que creen la inmortalidad del alma, porque están persuadidos de que despues de esta vida, tienen que hacer un viaje al otro lado del mar. I así entierran sus muertos con algunos comestibles, i ponen sobre su sepulcro uno de sus caballos aviado para que lo hagan con mas comodidad, e invocan al pillan i a la ballena para que los acompañen i ayuden en su viaje.

- Bernardi Havestadt (1777)

Havestadt 1883:668:

*gullchen**maihue*, campi Elysii; seu locus quo post obitum mortuorum animas migrare existimant, nempe occidentem versu, ubi sol occumbit in Insula *Mocha*.

Havestadt 1883:785:

Templcahue, anus, vetula; de quibus fablatur unam ex his *templcahue* post obitum apparere, ut desfuncti animam in insulam *Mocha* quam *carculafquen* appellant, abducat

- Juan Ignacio Molina (1787)

Molina 1787:85-86:

Subito che il defunto è abbandonato da' parenti, una vecchia detta *Tempulcague* viene, come essi dicono , in forma di balena a trasportarlo a' Campi *elisi*, ma prima di arrivarvi deve pagare il pedaggio ad un'altra pessima vecchia , che stà in certo passo stretto , la quale cava un occhio a' paffeggierì , qualora non venga puntualmente soddisfatta . Questa favola, come si vede , è molto simile a quella del vecchio *Caronte*, non già perchè sia stata copiata l' una dall' altra, ma perchè la mente umana posta nelle medesime circostanze si sorma le medesime idee . Le anime poi separate da' corpi esercitano nell' altra vita le funzioni stesse , ch' esercitavano in questa , senonchè colà non durano veruna fatica nell' eseguirle. I maritati vi hanno le medesime mogli, ma queste non vi partoriscono, perchè quel felice soggiorno non può essere abitato, salvochè da' morti. Oltre di che per la generazione vi vuole il corpo , ma quella incantata regione non soppotta de' corpi terrestre; tutto vi deve essere spirituale, o analogo allo spirito.

Molina 1795:91:

Al instante que los parientes han abandonado al difunto , una vieja llamada tempulcague , viene , como ellos dicen , en forma de ballena , para llevarlo á los Campos Elisios, pero antes de arribar allí, debe pagar el pasage á otra pesima vieja, que está en cierto paso estrecho , la qual quita un ojo á los pasageros, quando no es puntualmente satisfecha. Esta fábula , como se vé , es muy semejante á la del viejo Caronte, no porque haya sido copiada la una de la otra, sino porque la mente humana , puesta en las mismas circunstancias, se forma las mismas ideas. Las almas, pues, separadas de los cuerpos, exercitan en la otra vida las mismas funciones que exercitaban en esta, solamente que allá no padecen ninguna fatiga en la continuacion de ella. Los casados tienen allí las mismas mugeres, pero estas no paren, porque aquella feliz morada no puede ser habitada sino de los muertos. A mas de que para la generacion se requiere el cuerpo , pero aquella encantada region no sufre cuerpos terrestres ; todo debe ser espiritual, ó análogo á el espíritu.

- Felipe Gomez de Vidaurre (1789)

Gomez de Vidaurre 1889:320:

Acerca del destino que tendrán despues de la separacion del cuerpo sus almas, convienen todos en decir como los otros americanos, que despues de la muerte van a la otra banda del mar hácia el occidente, a un cierto lugar llamado *Gulcheman*, es decir, lugar de los hombres pasados. Quien de ellos dice que en este lugar los buenos gozarán de un territorio lleno de delicias y sin fatiga alguna, y tendrán sus mujeres, pero que no engendrarán, y los malos un territorio falto de todo. La alma será trasportada a las espaldas de una ballena, pero que antes de entrar a dicho lugar deben pagar todos un cierto tributo a una vieja, llamada *Tempulcague*, que hay a la puerta, la cual saca un ojo a aquellos que no le quieren pagar.

- Vicente Carvallo Goyeneche (1796)

Carvallo Goyeneche 1875a:145-146:

Por este mismo tiempo se sublevaron los imdios de la isla de la Mocha, i quitaron la vida a un español. Envió el Gobernador a su hermano Pedro de Villagra con 60 hombres para castigarles su infidelidad. Desembarcó en la Isla, i halló a sus habitantes en disposicion de defenderse. Intentó sujetarles con la fuerza, i le hicieron tan vigorosa resistencia, que se retiró con pérdida de dos españoles, i con dificultad pudo tomar la nave, i regresó al puerto de la Concepcion, dejando a los indios mas rebelados con la victoria que le ganaron.

Carvallo Goyeneche 1875b:182:

Sobre estos desabridos ocursos vinieron otros mas críticos (año 1684). Se puso a la entrada del puerto de Valdivia un navio inglés, i pidió práctico para entrar. Se le negó, i tomó la resolución de enviar a tierra su lancha armada en guerra. Puesta debajo de la batería del castillo de Amargos, intentó desembarcar alguna jente. Se opusieron los valdivianos, i aunque con pérdida de un hombre, los obligaron a retirarse, i tomaron el bordo de su nave, dejando siete ingleses que perecieron en la función. De allí pasaron a la isla de Mocha. Los indios le dieron buena acojida. Bajaron a tierra, i tuvieron carne fresca, aves, verdura, i mujeres para divertirse. Todo lo pagaron bien con armas, abalorios i quincallería, i se dieron a la vela después de algunos dias de refresco.

Carvallo Goyeneche 1875b:183-184:

Pasados algunos meses, llegó a noticia del gobernador el desembarco de los ingleses en la isla de la Mocha, i la hospitalidad que les hicieron los isleños. Esta noticia lo puso en el empeño de despoblar para quitar este recurso a la piratería. Dio esta comisión al maestre de campo don Jerónimo de Quiroga con órden de negociarlo por medios suaves i de amistad. Quiroga, que conocía bien el carácter de aquellos hombres les ganó la voluntad con dádivas i promesas, i les ofreció ventajoso territorio para su transmigración con habitaciones hechas, donde hallarían todo lo necesario para su subsistencia, i para labrar las tierras de su pertenencia, i algunos ganados de lana, cerda i vacunos para que estableciesen su crianza. Convinieron los isleños que mejoraban de situación, i de fortuna, i se resolvieron a la despoblación de su isla, que la eficacia de Quiroga verificó sin mal suceso en un barco de dos palos, dos piraguas, i muchas balsas (1686). Puestas en el continente seiscientas cincuenta personas de todas edades i sexos, que era el número de aquella población, las condujo a la parte septentrional del Biobio a unas fertilísimas vegas situadas sobre la ribera de este rio, que comenzando dos leguas mas arriba de su embocadura en el mar cerca del cerro de Chepe, se estiende cinco leguas hacia arriba.

Carvallo Goyeneche 1876:137:

No se les puede hacer entrar por la inmortalidad del cuerpo, segun i como enseña nuestra creencia, aunque se persuaden de la del alma. Se acercan mucho a la trasmigracion, como si en algun tiempo hubieran tenido maestros pitagóricos. Por este principio creen que, muriendo, no se acaban, sino que pasan a otra rejion situada a la otra parte del mar. I persuadidos de este viaje, se entierran los varones con armas, vestidos, caballo, alhajas i víveres para viático de su jornada, i las mujeres con ruecas, usos i otras alhajas propias del sexo. Este rasgo de viciada teolojía lo mezclan con un ridículo error. Están persuadidos que la entrada en aquella rejion se hace por un angosto paso, en donde reside una desapiadada vieja que cobra la entrada o portazgo, i si el viajero no lleva el precio establecido o su equivalente, con nada ménos se contenta aquella mala hembra que con un ojo.

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