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Martin, Alexander, 2001, *La dinámica del intercambio precolombino de Spondylus a lo largo de la costa pacífica central de Sudamérica (Perú, Ecuador)*, Tesis de Maestría, Florida Atlantic University.

Resumen:

Esta tesis provee un análisis de los restos arqueológicos de la concha *Spondylus* en la costa central del pacífico sudamericano. La frecuencia, distribución espacial, y contextos culturales son comparados geográfica y temporalmente con el propósito de establecer la razón del intercambio, la forma del tráfico, las rutas por las que se desplazó, y como evolucionó a través del tiempo. El muestreo usado en este análisis fuertemente respalda un escenario en el cual el tráfico de *Spondylus* con Perú se mantuvo de pequeña escala y poca sofisticación durante la mayoría de su existencia en forma de una serie de transacciones informales llevadas a cabo por comunidades vecinas. No es sino hasta Moche V en el valle de Moche, y durante la subsiguiente ocupación chimú, que una revolución con respecto a la explotación de este recurso ocurre. Esta revolución incluye un drástico incremento en la frecuencia de sitios que reportan *Spondylus*, una proliferación de sus representaciones iconográficas, la aparición de los contextos rituales descritos etnohistoricamente, y el comienzo de una infraestructura de redistribución organizada a nivel estatal (alrededor de Chan Chan).

Abstract:

This thesis provides an analysis of the archeological remains of *Spondylus* in the Central Pacific Coast of South America. The frequency of occurrence, spatial distribution and cultural context are compared both geographically and temporally to establish the reason for the trade of *Spondylus*, what form this exchange took, through what routes it moved, and how it evolved through time. The sample strongly supports a scenario in which *Spondylus* trade with Peru stayed relatively small scale and unsophisticated through most of its existence as a series of informal commercial transactions by neighboring communities. It is not until Moche V in the Moche Valley, and the subsequent Chimu occupation, that a revolution in the exploitation of this resource occurs with a sudden increase in site frequency, a proliferation of iconographic depictions, the appearance of ritual contexts, and the appearance of a state organized redistribution infrastructure (around Chan Chan).

The goals of this investigation are to establish the dynamics and evolution over time of the trade of *Spondylus* along the Pacific coast of South America. The following criteria, presence, quantity, type, and distribution of the shell in the archaeological record will be studied in order to ascertain what motivated the trade, what form it took, through which routes it moved, and how it evolved through time.

The study will first examine the motivating force of the trade. That is to say that it will establish what were the reasons that prompted its movement across geographical areas. Murra (1982:270) has already proposed that future studies should attempt to establish if the movement of *Spondylus* was due to: (a) commercial exchange; (b) redistribution within a single polity or "vertical control" (Polanyi 1957; Murra 1972); or (c) exchange between two polities where one is subordinate to the other.

Secondly, the study will investigate the mode of the exchange. This refers to the way in which the resources become distributed. Renfrew's (1975) typology of exchange outlines seven different modes of exchange applicable to this situation: (a) reciprocity (home based); (b) reciprocity (boundary); (c) down-the-line trade; (d) central place redistribution; (e) central place market exchange; (f) emissary trading; and (g) port-of-trade.

Thirdly, this study will investigate the most likely routes through which the resource was distributed. Hocquenghem (1995) has proposed that most studies of this resource to date have assumed a maritime route to the north coast of Peru, an idea originally proposed by Rostworowski (1970). However, she argues that a terrestrial route either through the Ecuadorian highlands or south through Tumbes is more probable. This study will consider if the data is more representative of either maritime or terrestrial movement of goods.

Finally, this study will consider how the trade of Spondylus evolved within the context of a changing economic and political relationship with the central Andes and coast of Peru through time. Four periods representing cultural phases of Ecuador and Peru will be used for comparative purposes: (a) Valdivia / Late Preceramic; (b) Chorrera / Chavin de Huantar; (c) Bahia-Guangala / Moche; and (d) Manteño / Chimu-Inca. The motivating force, mode of trade, and routes of movement will be established for each separate period in order to ascertain the changes and trends in the trade of Spondylus in relation to the development of South America.

INTRODUCTION

Significance of study

The study of Spondylus is of particular significance because it has been proposed to hold great ritualistic and economic importance to Andean civilizations (Murra 1982; Paulsen 1974; Marcos). This study will elucidate the growing complexity over time of the production and trade of this resource by pinpointing the cultures that most intensively exploited the mollusk. It will also yield information regarding the mollusk's first departure outside of the central Ecuadorian coast. The routes and major centers of distribution of the shell will be established. Finally, the distribution patterns of the shell throughout the region are expected to serve as the basis for future studies of the movement of this trade good.

The study presented here will help cement the foundation of future work on the subject. By recording the data, plotting it, and analyzing spatial distribution, which in turn will be tested against specific hypotheses, it is expected that a firmer base for future studies will have been created.

Delimitations of the Study

The area under study comprises the coastal and highland areas of Ecuador and Peru. The northern limit of the study is the political boundary of Ecuador. This northern cut off delineates the territory of the southern-most culture in South America within the natural habitat range of Spondylus. The natural habitat of Spondylus rarely goes beyond the southern coast of the Santa Elena Peninsula (central Ecuador) because of the cold Humboldt Current, making this the

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southernmost culture area with access to this resource (Pillsbury 1996). The *Spondylus* shell fragments and artifacts found south of central Ecuador will be attributed to trade proceeding from the cultures inhabiting the Ecuadorian coast, an idea widely accepted by scholars (Murra 1982, Marcos and Norton 1981, Marcos 1995, Pillsbury 1996). The southern limits for the area under study will be the site of Paracas in south coastal Peru. The reason for establishing this southern boundary is that it will encompass a broad area that includes major sites covering a wide span of time, of both coastal and highland cultures. Such sites as Chavin de Huantar, Chan Chan and Cuzco will be considered. The delimited area is illustrated in Figure 1.

By limiting the northern boundary of the investigation to the north of Ecuador, one is assured that the *Spondylus* found in archaeological sites is the result of trade. If we included areas north of the Ecuadorian coast, it would be difficult to ensure that the *Spondylus* present in those areas resulted from trade, as these regions could have acquired it themselves from their immediate locales.

The culture periods outlined for the purposes of this investigation will be:

Time period	Ecuador	Peru
(1)		3500 B.C. to 1500 B.C. Valdivia (3500-1500B.C.)Late Preceramic (3000-1
(2)		1500 B.C. to 250 B.C. Chorrera (1000-300 B.C.)Chavin de Huantar (800E
(3)		250 B.C. to A.D. 600 Bahia-Guangala (300 B.C.)MacD (200 B.C.-A.D. 800
(4)	600 A.D. to 1532 Chimu-Inca (A.D.800-1532)	Manteño (A.D.500-1532)

The periods were chosen because they encompass specific cultural periods that coexisted on the coast of Ecuador (the producers of *Spondylus*), and the more southern regions of Peru (the consumers). By connecting the *Spondylus* remains to specific cultural contexts, comparisons can be made between very distant regions.

The periods outlined reflect the general flourishing of the cultures, not necessarily their appearance or complete disappearance.

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GENERAL BACKGROUND

Spondylus Natural Habitat

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Spondylus is a bivalve belonging to the family Spondylidae. Olsson (1961) describes it as a shell of large or of medium size, solid, pectiniform but usually deformed due to fixation. The lower or right valve is generally larger, more inflated than the left. The hinge line is straight, each valve with two, stout, crural teeth and their bordering sockets. The shell is primarily radial, formed by ribs or riblets of primary, secondary, and tertiary size, often bearing pointed, fluted or spatulate spines. The coloration can be white, purple, orange, or red, the interior of the shell cavity is white and porcellaneous, often with a wide, strongly colored marginal band (Olsson 1961). It is because of this bright colored band that *Spondylus* has been extensively used as raw material for the production of ornamental artifacts by Pre-Columbian societies. This band, or lip, of the shell can be cut and re-shaped into a variety of artifacts.

Of the different subspecies of *Spondylus*, those found in the archaeological record fall into two subspecies: *Spondylus princeps* Broderip or *Spondylus calcifer* Carpenter

Spondylus calcifer

is large bivalve, of purplish-red color and is found from the Gulf of California to Ecuador. The smaller, more delicate,

Spondylus princeps

has a considerably smaller distribution ranging from Panama to northwestern Peru (Keen 1971, Olsson 1961, Pillsbury 1996:317-319). The range of the natural habitat of the two subspecies of *Spondylus* can be seen represented in Figure 2.

Spondylus calcifer, which was primarily used as raw material for beads and other ornaments, is relatively easy to harvest, since it appears in greater numbers at lesser depth. By contrast, *Spondylus princeps*

, which appears to have been valued ritualistically and traded both as finished artifacts and as the whole shell, is found singly or in small groups at depths between 15 and 50 m., making its acquisition more difficult (Keen 1971, Marcos and Norton 1981:148, Pillsbury 1996:317).

South of the equatorial line, both of these varieties were acquired from the ocean by the cultures inhabiting the Ecuadorian coast. This is primarily because *Spondylus* does not ordinarily appear in the colder Humboldt waters off the coast of Peru. *Spondylus* may briefly colonize the Peruvian coast as a result of unusually warm waters during "El Niño" events.

However, Sandweiss notes that the

Spondylus

populations would be both small and short lived and would not have provided a significant source of shells for Peruvian rituals (Sandweiss 1992:note 79, Pillsbury 1996:317).

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Previous Research

The trade of *Spondylus* along the Pacific coast and to the Andes has been amply discussed due to its undeniable presence in the archeological record in regions far away from its natural habitat. Examples of this mollusk have been found from Mesoamerican cities such as

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Teotihuacan, Tikal, Uaxactun, and Palenque (Feldman 1974:131, Coggins 1988:78-79) to the southern Peruvian sites such as Chincha and Pinilla (Paulsen 1974, Sandweiss 1992).

Depictions of *Spondylus* appear in a wide range of ancient American civilizations. Examples range from the Maya in which “elite Maya women on monuments wear the precious worked *Spondylus* shell... as at

Naranjo, [in] Stela 24” (Coggins 1988:78) to Chavin de Huantar in which *Spondylus*

is seen represented alongside a *Strombus*

Shell on the Tello Obelisk (Paulsen 1974:599). The widespread presence in the archeological record becomes even more significant once we take into account that in its natural habitat

Spondylus

can only thrive in the warm waters north of the gulf of Guayaquil. And even here, it usually can only be found well beneath the surface where only experienced divers can reach it. For these reasons,

Spondylus

has long drawn the attention of scholars who have tried to understand its widespread distribution.

This distribution has often been explained as the result of a trade network that originated in the areas where *Spondylus* naturally exists (mainly in the littoral area of lowland Ecuador) and, over time, grew to supply areas in the far-reaching Andes and Mesoamerica. For this reason, while looking at its presence in the archeological record, many scholars have tried to ascertain both the nature and development of this *Spondylus* trade network throughout American prehistory.

Murra first brought to the attention of scholars the existence of this *Spondylus* “trade system” in 1971 (published 1982). He did this through the review of several historical and ethnographic reports from the time of Spanish contact and shortly after. The accounts not only describe the importance of the mollusk to indigenous populations, but also suggest the presence of a sophisticated commercial network set up to handle its distribution throughout the Andes. The picture that the accounts presented was that, at the time of conquest,

Spondylus

was intractably linked to the economic and ritualistic life of the inhabitants of South America.

Furthermore, the historical accounts show evidence that the indigenous populations of South America were making use of certain items (such as copper and perhaps

Spondylus

) in ways that very closely resembled true currency.

Because of the importance that these accounts attribute to shell trade (in spite of the very European obsession with gold and emeralds) Murra (1982) encouraged scholars to focus their efforts on what seemed to be a luxury item of great importance to the indigenous populations. He noted that little attention had been paid to *Spondylus* in archaeological work despite its clear importance in the ethnographic and historical record. According to Murra, future archaeological work should focus on answering the many questions surrounding this resource, amongst them, who organized its traffic and whether it existed prior to Inca times.

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Murra saw some similarities between the *Spondylus* trade and true commercial exchange and thus considered that future studies should try to establish if the movement of *Spondylus* was: true commercial exchange, redistribution of resources within a single political unit, or exchange between two political systems where one is subordinate to the other (Murra 1982).

Concerning the “trade network” that distributed the shell, Murra pointed out that Rostworowski (1970) made reference to a historical account which stated the presence of some 10,000 tributaries that made use of *balsa* rafts and 6,000 tributaries who specialized as “merchants” in the Chincha region of Peru during Inca times. As the account states, these merchants are said to have traveled throughout the Chincha to places like Cuzco and Quito. Finally, the account makes reference to the merchants traveling to Puerto Viejo (in the central Ecuadorian coast) to visit and trade with the *Caciques* that lived there

(Rostworowski 1970: 170-171). This narration, together with a famous historical account of the Spanish abduction of a *balsa* raft

from the Salangone chiefdom filled with trading cargo (Pizarro 1844), helped cement the concept of a maritime trading network between the Chincha and the central Ecuadorian coast. Hocquenghem (1995) has pointed out that concerning the routes of

Spondylus

trade, the maritime route presented by Rostworowski is the one most used by scholars. However, she argues that the accounts narrated by Rostworowski only make reference to the existence of both sailors and merchants. It does not state that the merchants were necessarily using the *balsa* rafts for their trading. For Hocquenghem a maritime trading route seems unlikely because of the hard navigating conditions of the Illescas peninsula, south of Paita where the strong Humboldt current makes navigation difficult even for ships with sails. Instead, she proposes that

Spondylus

were most likely distributed through terrestrial routes in Inca times and before, either through the Ecuadorian highlands or through Tumbes and beyond (Hocquenghem 1995:271-276).

Shortly after Murra’s treatise on the subject, Paulsen (1974) produced the first comprehensive treatment of the movement of *Spondylus* throughout South America in archaeology. She outlined three periods (A, B, and C) that were marked by the size of the exchange sphere and the role played by the shell in cultural contexts. From 2800 to 1100 B.C. (Period A),

Strombus

and

Spondylus

appear in their natural form mainly in Valdivia sites on the central coast of Ecuador. Presences of the shells in inland sites and in the Ecuadorian highlands are sporadic and appear only as “worked ornamental objects” as opposed to the raw material also found on the coast. From 1100 to 100 B.C. (Period B), the presence of the two shells was sporadic in the archaeological record of northern Peru, they appeared prominently in the iconography of the Tello Obelisk at Chavin de Huantar. Thus, Period B shows the first clear indication of

Spondylus

use in a non-utilitarian, ceremonial context. Finally, Period C, from 100 B.C. to the arrival of the Spanish, is characterized by the presence of

Spondylus

throughout Peru both in the archeological record as well as in the iconography.

This last period was to Paulsen representative of long distance exchange in order to satisfy an oracle-centered ritual. Yet, Paulsen goes further than just sketch three distinct periods, she also proposes that the periods are demarcated by the increasing stratification of Chavin society as it made its way into a true state formation (Paulsen 1974). Hence, the “trade network” is seen as inextricably fused with the development of the area. This study would set the tone for future works by proposing that the shell itself, and its trade, was a pivotal component in the development of the region.

Marcos (1977/1978) later proposed a model for a lineal exchange system whereby *Spondylus* was systematically traded between Ecuador and southern Mexico through a series of maritime stops along a line of exchange. Perhaps the most direct and hard evidence of this “trade network” came from “La Plata” island (Marcos & Norton 1981), located some 23 km west of the southern Manab’ coast. Marcos and Norton proposed that “La Plata” constituted one of a series of “ports” or “stops” along the way of a trade network that connected South America to Mesoamerica. Findings at “La Plata” Island supported this hypothesis. The findings included evidence of communities ranging from Valdivia periods to Manteño. Not only did some of the artifacts point to a small permanent residence in the island, but there was also evidence of ceremonial activities surrounding the two shells throughout the occupations. It is important to note that in the earlier occupations the concentration of *Spondylus* is much smaller and often appears in offering-like settings. By contrast, the later occupations (Chorrera, Bahia, and Manteño) show a much higher density of

Spondylus

that were not necessarily tied to ceremonial context. Most striking of all is a habitation layer with over 600

Spondylus princeps

specimens that had been carefully cleaned.

An underwater inspection of the surrounding areas revealed a very sporadic presence of *Spondylus princeps*

around the island, as opposed to a much higher, more accessible

Spondylus calcifer

population. Norton proposed that the minimal presence of *princeps* found underwater could not account for the great number of valves found on land. Also, the later occupations show artifacts from diverse cultural contexts (such as Bahia, Jama-Coaque, and Guayaquil), indicating the interaction of populations of diverse areas. Finally, large quantities of utilitarian items that could be interpreted as being related to a

Spondylus industry

, such as diving weights and fishing hooks, were also present. When taken in conjunction, these items make the best case for the presence of a “trade system” that included “La Plata” Island as one of its stops (Marcos & Norton 1981). It is also important to note that the excavation also revealed that the context of the shells changed in different periods. While some periods are indicative of ritualistic activity, others are more representative of caches for distribution purposes. The contents of “La Plata” Island point out that the trade of this shell changed and

evolved over time.

The archeological evidence presented from sites throughout the Andean Septentrional area, the Central Andean region, Mesoamerica, and finally from “La Plata” Island provide a strong case for a heavy movement of this resource throughout the continent. Thus, after having observed a widespread distribution of this resource in the archaeological record, scholars began to attempt to understand its relationship with the cultures that exploited it. In the same style of Paulsen, many scholars have proposed that it was Spondylus, and its trade, that was inextricably linked to the cultural development of the region (Zeidler 1991, Masucci 1995, Marcos 1995). The study of *Spondylus* movement is not only important to understand the movement of goods in the region, but also because it ultimately has great influence in shaping the cultures that exploit this resource.

Marcos argued that it was the reliance and affinity that the inhabitants of the central coast had towards this one resource that shaped the cultures there.

Exchange Systems Theory

Within anthropology, discourse on trade theory has been an integral part of the analysis of cultures. Attempting to establish the rules of trade and exchange has lead many anthropologists to formulate theoretical models that explain the principles of distribution of resources. These principles are integral in formulating an understanding of the trade of Spondylus in South America.

During the 1920's Malinowski performed pioneer work on this subject. His study of Melanesian societies (1922) brought attention to a complex system of exchange denominated the kula ring. In this system, Melanesians traded necklaces in a clockwise direction through several islands positioned in the shape of a ring. Arm shells, on the other hand, were traded along the same path, but in a counter-clockwise direction. He proposed that aside from the ceremonial context in which these exchanges took place, they also served the functional purpose of cementing relationships between the inhabitants of the islands. A related concept to that of the French sociologist Marcel Mauss (1925), in which the actual presenting of gifts is subordinate to the social structures they help to maintain. Malinowski's treatment of the kula ring also pointed out that the exchange of ceremonial items, such as arm shells and necklaces, was complemented by exchanges of important (although not apparent) everyday commodities. He notes about the kula, that “associated with it, and done under its cover, we find a great number of secondary activities and features. Thus, . . . the natives carry on ordinary trade, bartering from one island to another a great number of utilities, often unprocurable in the district to which they are imported, and indispensable there” (Malinowski 1922). This study helped cement the concept that the trade of items, even of those that are ceremonial in nature, is integrally linked to the economy and development of a culture.

However, it would be over three decades later that Polanyi (Polanyi 1957; Polanyi 1963) produced the first scheme for the classification of different forms of trade. He proposed a distinction between three classificatory, elemental, and what he argued were evolutionary forms of trade. First is reciprocity, in which the giving of an item has the implicit requirement that the

item be repaid with one of equal value. This form of exchange does not require the presence of a centralized authority and usually takes place amongst individuals who are equals. The second form of exchange outlined by Polanyi is redistribution. This form implies the operation of a centralized authority that acquires items and redistributes them, although not necessarily equally. Redistribution can be considered a form of internal exchange since it works under a coherent political unit. The final form of exchange described is market exchange, which encompasses competition among producers and suppliers and is, thus, subject to price fixing and bargaining. Murra does not propose market exchange for the pre-Columbian Andes, but he does present the possibility of some type of informal trade where separate polities exchange items through bargaining and price fixing, which he denominates “commercial exchange” (Murra 1982). Polanyi also introduces the concept of a port-of-trade. This is defined as a place where traders of different political units can freely meet in a politically neutral place (Polanyi 1963) and it relies on the existence of some type of market exchange.

Using Polanyi’s classification, the differences between redistribution and market exchange become significant to the discussion of Spondylus trade. This is because the definition of redistribution depends on interaction within one political unit. On the other hand, the definition of market exchange allows for both internal exchange (as in the rural markets of China) and external (as in the concept of port-of-trade). Thus, if Spondylus is being traded through more than one political unit (or found outside of the political unit that produced it) it can be inferred that the form of trade was akin to market exchange. Furthermore, the criterion that separates reciprocity from redistribution (according to Polanyi) is the existence of a centralized authority. Thus, if it can be established that those exchanging Spondylus were of the same cultural group but not under the control of a centralized authority, it can be inferred that the form of trade was reciprocity as opposed to redistribution.

At this point, it is important to add Murra’s (1972) concept of “vertical control.” Murra (1982) pointed out that the study of Spondylus trade in the central Ecuadorian coast should take into account this Andean feature. In vertical control, people belonging to one ecological area simultaneously control resources in several other ecological zones and redistribute the resources to the economic nucleus, where the majority of the population resides. Murra proposed that ethnographic and archeological evidence suggest the probability that both coastal and highland populations were involved in vertical control such that very diverse and distant ecological areas might have been under the control of a single ethnos.

Another important classificatory scheme that must be considered when dealing with trade theory is that offered by Renfrew (1975). His typology of “modes of trade” attempts to classify the different ways by which a resource becomes distributed. Hence, as opposed to Polanyi’s scheme, which focuses on different motivating forces or reasons for trade, Renfrew’s scheme focuses on the mechanisms by which resources move from one area to the next.

In order to classify the different modes of trade, Renfrew subdivided exchange types into ten different categories, which represent specific relations between entities and the areas where the resources exist. Some of the modes of trade he outlines are representative of less complex societies while others include features (such as emissaries) that are representative of more specialized societies. However, since this study includes a variety of periods with societies of

different levels of complexity, different classifications can be applicable at different periods of time. Following are the modes of exchange outlined by Renfrew and their application to the study at hand (also depicted in Figure 3).

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1. *Direct access*: in this type, the inhabitants of area A have direct access to the resources from area B without any reference to their inhabitants. This is not actually an exchange type, rather the inhabitants of A simply harvest or collect the resources from B without permission from the inhabitants of B. Since there is sufficient archaeological evidence to prove that the inhabitants of the central Ecuadorian coast controlled the Spondylus resource (Currie 1995a; Marcos 1985, 1995; Norton 1986; Paulsen 1974; Zeidler 1991), and it seems very unlikely that the inhabitants of Peru could collect Spondylus on the Ecuadorian coast without reference to its inhabitants, this mode of trade will not be considered for the study.

2. *Reciprocity (home based)*: The inhabitants of area A visit area B and exchange items with the inhabitants of B. Note that this scenario is distinguished from emissary trading (described below) because here, it is the actual producers of the goods who do the trading, not a subordinate emissary. This scenario would entail the actual producers of Spondylus in the Ecuadorian coast to travel out of their territory into other chiefdoms and states in order to trade the resource. Because of ethnographic evidence (Murra 1982; Pizzaro 1527) that makes reference to a Spondylus trade network in which the inhabitants of central Ecuador navigated to other regions, and considering the generally unspecialized nature of early Ecuadorian cultures, this seems to be a likely scenario and thus will be considered in the study.

3. *Reciprocity (boundary)*: In this scenario the inhabitants of areas A and B both meet at their common boundary in order to exchange items. This scenario would entail that the producers of Spondylus trade their resource only to their adjacent neighbors. Furthermore, it stipulates that the inhabitants of the central coast of Ecuador did not go any further than their boundaries in order to trade this resource. This scenario is not very plausible to have occurred in the later stages of cultural development of the region, since Spondylus in the archaeological record are found throughout South America. In fact, it is found in cultures that are separated from the inhabitants of the central coast of Ecuador by several culture areas, for example in Chavin de Huantar, which is several chiefdoms/states removed. However, this mode of trade will be considered in the study because it may be representative of the earliest periods of cultural development, where Spondylus are not found far from the central Ecuadorian coast.

4. *Down-the-line trade*: This is when home base or boundary reciprocity occurs successively through many adjacent culture areas. This results in items getting passed on throughout many culture areas without the original producers actually having to travel farther than their neighbor's area. For the purpose of studying Spondylus trade this scenario is of great importance because it explains a situation in which items can travel a great distance without the producers of it having any control of its trade or direction. If it is the case that Spondylus are found throughout Andean South America, the probability that this was the result of successive down-the-line diffusion through several cultures (as opposed to a coherent organized trade network) must seriously be entertained.

5. *Central place redistribution*: The producers of goods of area A, as well as those of area B, give the items to a central authority outside their boundaries, receiving something in exchange, then or subsequently. This central authority in an area independent of A or B, redistributes the resources according to its own logic. It has been proposed that economic centers such as Chavin de Huantar arose due to their strategically positioned locations, which allowed elite individuals to gather and distribute a variety of resources from diverse ecological zones (Zeidler 1991). Then, Chavin de Huantar would fit the profile of a central place of redistribution almost perfectly. Thus, this type of trade will also be considered in the study at hand.

6. *Central place market exchange*: This scenario is the same as central place redistribution with the exception that the exchange of items is not mediated by an authority figure. Instead, both A and B travel outside their boundaries and trade items with each other based on rules of bargaining, price fixing, supply and demand. Note that this form of exchange can be differentiated from port-of-trade (described below) because in this scenario, it is the actual producers of the resources who do the trading, as opposed to trading emissaries which are representative of more complex and specialized societies. Since there is a possibility that in economic centers, such as Cerro Narrio, people of different places freely meet to trade with each other (including the producers of Spondylus), this type of trade must also be considered if only for the earlier periods of development.

7. *Freelance (middleman) trading*: An independent entity of the people who have a resource exchange for it in their area, then, in turn, the entity travels to other areas to trade for other resources. Ethnographic accounts state that the vast trade network that served to distribute Spondylus (amongst many other items) was in fact under the control of the Salangone chiefdom (Pizarro 1527) comprised of inhabitants of the central Ecuadorian coasts where Spondylus were acquired. It has also been pointed out that it was the presence of the rare Ochroma tree in the region that allowed for the inhabitants of the area to develop an industry of balsas, which they used to monopolize trade routes (Norton 1986). For this reason, it seems unlikely that a middleman acquired the resources in the coast of Ecuador and traded them abroad. Instead, most of the literature (Currie 1995a; Marcos 1995; Marcos & Norton 1981; Masucci 1992) suggests that it was the inhabitants of the region that were responsible for trade of this resource. Hence, the middleman scenario will not be considered.

8. *Emissary trading*: The inhabitants of A send an emissary, who is under control of A, to the inhabitants of B to exchange goods with them. This scenario is similar to reciprocity (home based) except that it is not the actual producers of the goods that perform the trading; instead, it is an individual subordinate to an organized authority. Because of the level of complexity and high degree of specialization of the trade network described in historical accounts (Pizarro 1527) it seems likely that those conducting the trade were not the actual producers. For this reason, this mode of trade will be considered.

9. *Colonial enclave*: The inhabitants of area A set up a colonial enclave in area B where they can trade with the inhabitants of B. Because of the lack of archeological evidence of colonial enclaves from the central Ecuadorian coast this scenario will not be evaluated.

10. *Port-of-trade*: this scenario refers to a neutral place outside the jurisdiction of A and B,

where both can send their emissaries to trade. This scenario is differentiated from central place market exchange because in port-of-trade, it is not the actual producers of the goods that do the trading, rather specialized emissaries who are subordinate to an organized authority. Also, in contrast to central place market exchange, this type is indicative of trade between large complex specialized societies. The existence of ports-of-trade where specialized traders from the central Ecuadorian coast exchanged goods seems likely especially when taking into account the high degree of specialization of the trade network described in historical accounts, hence this mode will also be evaluated.

Furthermore, Renfrew (1975:41-49) notes that in the last four types, B itself is likely to be a central place. Also, he points out that five of these modes (down-the-line, freelance, emissary, colonial, and port-of-trade) transport goods over very great distances. Regarding their rates of distribution, Renfrew suggests that in modes 1, 2, and 3 the frequency of appearance falls at a gradual, steady pace as distance from the production source increased. On the other hand, in down-the-line trade, the frequency of appearance decreases exponentially, as can be seen represented in Figure 4. In the case of directional trade (which can include redistribution and the presence of central places) there should be a clearly marked “peak” in the frequency of appearance as one moves away from the source and towards the central place. This is illustrated in Figure 5.

{rokbox}images/stories/tesis/Martin2001_Page_33_Image_0001.jpg{/rokbox}
{rokbox}images/stories/tesis/Martin2001_Page_51_Image_0001.png{/rokbox}

One must also note that Renfrew’s classification assumes that both cultures involved in an exchange have a relatively equal level of influence over each other. However, the possibility that trade is conducted on unequal bases, and thus for the greater benefit of one of the parties, must also be considered. Building upon Marxist theory, Wallerstein (1974) proposed a broad approach to market exchange that is not bound within single polities. Instead, it explains a system by which one polity can make another polity subservient through economic means, even if they remain politically independent. This approach is known as “world system’s theory.” A simplified version of this theory separates the world into “peripheral” areas, which are non-industrialized polities that largely produce cheap, raw materials. These peripheral areas sell their raw products to “core” countries, which mainly produce manufactured, significantly more expensive, products. These core areas, in turn, sell back their expensive manufactured products to the periphery. Because of the nature of the market dynamics the periphery becomes dependent and exploited by the core, which increasingly accumulates capital and becomes richer at the periphery’s expense. Wallerstein also proposes the existence of “semi-periphery” areas, which incorporate qualities of both core and periphery.

It must also be noted that while Wallerstein’s theory focused on “bulk good” or “necessities” as the central elements of exploitation, Chase-Dunn and Hall expanded the definition to include prestige goods, political protection, regularized military conflict, and information exchange networks (Chase-Dunn and Hall 1997:13,59). However, Chase-Dunn and Hall do note that core control of a periphery that produces prestige goods is more unstable because peripheries can readily substitute other goods (Chase-Dunn and Hall 1997). Another important aspect is the implication that the periphery becomes dependent on the economy of the core, while the core,

having multiple peripheries, does not have to rely solely on any given periphery. This is not to say, however, that peripheries necessarily become dependent on only one core. In fact, different cores will sometimes compete economically for the control of peripheries, allowing one periphery to be dependent on more than one core (Chase-Dunn 1989). However, the distinction between the two should be understood through the fact that while the cores are multifaceted exploiters of resources, the peripheries become dependent because they are mostly concerned with the production of prime items.

This theory was originally devised to explain the exploitation and dependency of the West Indies by the British Empire, and has subsequently been used to explain the exploitation of contemporary third world nations by industrial countries. However, recently anthropologists have tried to use this model of economic dependency for non-capitalist and non-industrial societies. Most specific to this study is Zeidler's (1991) analysis of the development of Valdivia sites in relation to the formation of Chavin society. He points out the close similitude to "core and periphery" in the relationship between a more developed Chavin de Huantar, which used Spondylus as a prestige and power symbol, and a less developed, Spondylus producer central Ecuadorian coast. Thus, the probability of economic dependency must also be considered. This point was also brought up by Murra (1982) when he proposed that the distribution of Spondylus in South America might be the result of "*traffic conducted by empires like the Tawantinsuyu, but also by others before it, in order to supply themselves with important economic-ritualistic material (...) not within their land*" (Murra 1982-270).

Another important point that needs to be addressed is that if Spondylus trade is linked to the cultural development of the region, then the study of the systemic mechanisms that move it must also take into account the different possible frameworks that explain its relationship to the culture. Brumfield and Earle (1987) pointed out that there are three main theoretical approaches to the study of exchanges that explain the relationship between resources and cultural development: adaptionist, political, and commercial developmental. Adaptionist models explain specialization and exchange as the result of the intervention of an elite who attempt to redistribute resources for the benefit of the rest of the society. Political models are similar, but specialization, exchange, and the transfer of goods from producers to political elites are seen as lying at the heart of political development, sustaining the elites and enabling them to fund new institutions and activities that are aimed at extending their power. Thus, political models see specialization and exchange as the result of political elites who develop the system for their own benefits. Finally, commercial development models explain specialization and exchange as the result of the spontaneous process of economic growth. According to this approach, increasing social complexity (such as specialization and class division) is regarded as an autonomous process dictated by economic efficiency. Hence, economic variables and the exploitation of resources shape culture. It is this latter approach that will be used for the analysis of Spondylus trade in South America. Even though commercial models are often thought to be largely at work in modern economies, Smith (1976) points out the importance of exchange systems in influencing the development and stratification of agrarian societies.

The final distinction that must be considered is that between valuables and commodities. Dalton (1977) proposes that high prestige gifts that have a special importance in ceremonial exchanges should be denoted valuables and separated from commodities, which are everyday utilitarian objects such as foodstuffs and pots. We should note that concerning the trade of

Spondylus in South America, this becomes a difficult categorization. While many scholars have proposed its ceremonial and ritual importance and its high prestige has been amply documented (Paulsen 1974; Marcos 1985,1995) it is also true that Spondylus, in the shape of food and beads for ornamentation, was also used (Murra 1982). For this reason it becomes difficult to ascertain if indigenous populations saw Spondylus as either a commodity or a valuable. Furthermore, its significance was different in different regions or at different times. It is hoped that this study, by reconstructing its movements and evolution over time, will also help shed some light on the status of the mollusk at different areas and at different periods.

HYPOTHESES & METHODOLOGY

This study focuses on reviewing primarily those sites discussed in the academic literature on the subject of Spondylus in archaeological contexts. Because of the inconsistency of academic papers in distinguishing between the two most common subspecies (princeps and calcifer), the remains will be treated at the species level and considered together. All the sites discussed in the background literature will be compiled and plotted both temporally and geographically. By doing this, it is hoped that a broader picture of the trade of Spondylus will be elucidated.

In order to understand the dynamics of Spondylus trade, the study is divided into four separate areas, each dealing with a particular aspect of trade.

Establishing the Motivating Force of the Trade

A primary question to be addressed is what was the motivation behind the movement of the Spondylus resource. For the purposes of this study the following possible motivations will be assessed: commercial exchange; redistribution within a single polity or “vertical control;” or exchange between two polities where one is subordinate to the other, following a periphery/center model proposed by Murra (1982) and Zeidler (1991). Understanding what drove the trade is integral to grasp the role that the resource played in the area.

In order to identify the motivation of the trade, archeological remains of Spondylus and related artifacts will be recorded in terms of presence, quantity, and distribution throughout the delimited area. The sources for this data will include academic papers and books on the presence of Spondylus, archeological site reports, and any published material in which the presence of this resource in a cultural context is recorded.

The presence and distribution of the shell and the cultural context of the period they are found in will be compared against specific hypothesis, each for the three different motivating factors of trade outlined above. If the data is representative of the criteria of each type of motivation, then, the hypothesis will be sustained. On the other hand, if the data available does not meet the criteria of the different motivating factors, then the hypothesis will not be supported.

(H1) The archeological remains of Spondylus throughout the delimited area in any of the four proposed periods are representative of commercial exchange.

According to Polanyi (1957), market exchange (unlike redistribution) does not have to occur

within the context of a single political unit. Instead, market exchange requires, as principle criteria, a social relationship where bargaining and price fixing can occur, thus responding to the rules of supply and demand. He outlines two primary elements that must exist for the relationship to be considered a “bargaining market” relationship, a supply crowd and a demand crowd. These two, even though often thought of as an indivisible unit, can in fact be separate “according to whether they dispose of the goods as resources, or sought them as requirements. Supply crowds and demand crowds need not therefore be present together” (Polanyi 1957: 267-268).

Hence, the data can be found in one or more polities and be evidence for market exchange. What must be identified is the presence of a supply crowd and a demand crowd, both in a context that allows for them to freely exchange their items without the intervention of a regulating force. Thus, whenever Spondylus is found throughout two or more polities that are independent of each other all the criteria for a bargaining market have been met. In that case the exchange is free of any one political control and hence subject to the rules of supply and demand.

On the other hand, when the data is found within only one political unit, it can be either internal commercial exchange or redistribution. In this case, both a supply crowd and a demand crowd must still be found and also sufficient proof must be established that their interaction was not directed by the polity’s authority.

(H2) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of internal redistribution or “vertical control.”

According to Polanyi’s (1957) typology, if the trade of Spondylus was being driven by redistribution we would expect to see the presence of some centralized authority and the presence of a coherent political organization. Thus, if the data is found (a) in multiple locations within a single political unit, and there is evidence of

(b) a strong level of centralized authority capable of redistributing resources, then the data can be representative of redistribution.

(H3) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of a center-periphery relationship where trade is conducted between two polities, one being economically dependent on the other.

According to Wallerstein’s (1974) World-System Theory, if the data is representative of a center/periphery relationship where trade is conducted between two polities, one being economically subordinate to the other, we would expect to find that: (a) the producer (periphery) polity should be less complex than the center polity; (b) the peripheral polity should concentrate on the production of prime elements, while the core polity should exploit a multifaceted variety of resources from different locations; (c) the resources should be directly distributed to the central polity which would be in charge of processing it and distributing it elsewhere; and finally, (d) the economy of the periphery polity should be economically dependent for their subsistence on the center polity.

Establishing the Mode of the Trade

A critical dimension to be examined is how the resource came to be distributed. The solution to the problem will give a better understanding of the mechanisms that moved the resource, the level of complexity of the trade, how many different cultures the trade encapsulated, which cultures or entities controlled the resource, and which were the main economic centers through which the resource passed. The possible modes of trade (Renfrew 1975) outlined for this study are reciprocity (home based), reciprocity (boundary), down-the-line trade, central place (redistribution), central place (market exchange), emissary trading, and port of trade.

It should be noted that Renfrew's typology differs from Polanyi's typology in that, while Polanyi deals with the reason for the movement of goods (either for commercial gain or internal redistribution), Renfrew's typology deals with the mechanisms by which these resources move from one area to the other.

(H4) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of a reciprocity (home based) mode of trade.

According to Renfrew's typology, if the data is representative of reciprocity (home based) we would expect to find (a) the same producers of Spondylus to be responsible for the trading; (b) low degrees of specialization, modes of production and minimal central authority, the societies involved in the trading should also exhibit lower degrees of stratification and a less organized social structure; (c) there should be evidence that those who acquired the Spondylus either actually ventured into the culture area of those who produced it, or were visited in their culture area by the producers of Spondylus, (d) the extent of the Spondylus distribution should be minimal, encompassing only those areas within close proximity to the producers; and finally (e) the distribution rate should show that the frequency of occurrence decreases gradually and steadily as distance from source increases (as seen on Figure 4).

(H5) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of a reciprocity (boundary) mode of trade.

According to Renfrew's typology, if the data is representative of reciprocity (boundary) we would expect to find: (a) the producers of Spondylus to be responsible for the trading; (b) low degrees of specialization, modes of production and minimal central authority; the societies involved in the trading should also exhibit lower degrees of stratification and a less organized social structure; (c) there should be no evidence that either the producers of Spondylus or those who acquired it ventured into the culture area of the other; (d) the distribution of Spondylus should be minimal, encompassing only those areas within close proximity to the producers; and finally (e) the distribution rate should show that the frequency of occurrence decreases gradually and steadily as distance from source increases (as seen on Figure 4).

(H6) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of a down-the-line mode of trade.

According to Renfrew's typology, down-the-line trade would entail many successive boundaries

or home based reciprocity exchanges to occur so that the resources become distributed over many culture areas. Thus, this mode of trade is paradoxical because the resource becomes distributed over large areas while the stratification, specialization, and modes of production can remain low or simple, sometimes with no centralized authority or directional trade. Thus, for the exchange to be down-the-line trade there should be: (a) little presence of centralized authority encompassing the many culture areas where the resource is found; (b) low degrees of specialization and modes of production; the societies involved in the trading should also exhibit lower degrees of stratification and a less organized social structure; (c) the distribution of Spondylus should be very large and extensive, encompassing many successive culture areas far away from the producers; and finally (d) the distribution rate should show that the frequency of occurrence decreases exponentially as distance from source increases (as seen in Figure 4).

(H7) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of a central place redistribution mode of trade.

According to Renfrew's typology, central place redistribution requires: (a) the presence of an economic center, or central place, where goods can be redistributed to and from; (b) for this central place to be under a clearly centralized authority; (c) the motivation behind the trade should be the redistribution of resources for the benefit of the "central place polity," not the economic gain of either suppliers or consumers. In other words, it must meet the criteria for (H2) redistribution; (d) for this central place to be an independent polity of both the consumers and suppliers; (e) high degrees of specialization and high degrees of stratification on the part of the "central place polity;" and finally (f) the distribution of the resource should show an increase (or "peak") in the frequency of occurrence as one moves towards the "central place" and away from the source (as can be seen illustrated in Figure 5).

(H8) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of a central place market exchange mode of trade.

According to Renfrew's typology, central place market exchange requires: (a) the presence of an economic center, or central place, where goods can be redistributed to and from; (b) this economic center should be a neutral place where bargaining and price fixing can occur, thus responding to the rules of supply and demand; (c) the motivation for the trade should be economic gain rather than directed relocation of resources on the part of the "central polity" (in other words, it must meet the criteria for (H1) commercial exchange); (d) the central place should be an independent polity of both the consumers and suppliers; (e) high degrees of specialization and high degrees of stratification on the part of the central place polity; and finally (f) the distribution of the resource should show an increase (or "peak") in the frequency of occurrence as one moves towards the "central place" and away from the source of production (as can be seen illustrated in Figure 5).

(H9) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of an emissary trading mode of trade.

According to Renfrew's typology, emissary trading exchange is differentiated from previous modes because it reflects a more complex society with the presence of an emissary industry (or

full time trade specialist) on the part of one polity. As noted by Renfrew (1975:43) the receiving end could still be a “central place.” Thus, the only criteria that distinguishes emissary trading from central place (redistribution & market-exchange) is the increased level of specialization, stratification, and production on the part of the producer polity. Hence for the purposes of this study, for the data to be representative of emissary trading it should meet the criteria listed on top of meeting the criteria for another mode of trade.

Hence, if the data is representative of emissary trading then: (a) on top of meeting the criteria for another mode of trade; it should also (b) show evidence of belonging to a culture with high degrees of specialization and stratification in order to maintain full time trading specialists; (c) the culture should have more intense modes of production to maintain a long distance supply; and (d) there should be a wide distribution of the resource throughout distant areas far away from the production of the source.

(H10) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods are representative of a port-of-trade mode of trade.

According to Renfrew’s typology, port-of-trade exchange requires the presence of (a) interaction between highly complex, specialized, and stratified societies (b) the presence of full time trading specialists; (c) a wide distribution of the resource, and (d) the clear presence of a designated, politically independent, neutral port-of-trade.

Since many modes of trades can be occurring concurrently and some larger modes of trade can “mask” the presence of smaller ones (for example, central place redistribution would mask local reciprocity) it is expected that the data can simultaneously fit several hypotheses. Thus, it must be noted that hypotheses are not mutually exclusive.

Establishing the Route Through which Spondylus Shells were Distributed

A point of contention among scholars has focused on the route Spondylus trade took. It is necessary to evaluate Hocquenghem’s proposition (1995) that Rostworowski’s argument (1970) for a maritime route is questionable.

(H11) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods sustain the proposition that the resource was distributed through a terrestrial route.

As proposed by Hocquenghem (1995), Spondylus were distributed through a terrestrial route that began from the central coast of Ecuador and moved to Peru through either the Ecuadorian highlands or south through Tumbes. It is expected that if this is the case, the presence of Spondylus in the archeological record should follow a homogeneous, continuous, and even distribution from the source to the far reaching areas in Peru.

(H12) The archeological remains of Spondylus throughout the delimited area in any of the proposed periods sustain the proposition that the resource was distributed through a maritime route.

It is expected that if, as proposed by Rostworowski (1970), Spondylus were distributed through a maritime route that brought it directly to Peru, particularly to the south of the Illescas peninsula (Hocquenghem 1995:262-270), then the areas between the central coast of Ecuador and the Illescas peninsula should exhibit a marked gap, or decrease in frequency, in the amount of shells present.

Establishing how the Trade of Spondylus Evolved in Increasing Complexity Through Time

In order to understand the economic and political relationship between the central Ecuadorian coast and its neighbors in the central Andes and coast of Peru, I analyze the purpose, mode of trade, and form of the Spondylus artifacts at different periods to ascertain any “changes” or “trends” in the trade of Spondylus through time. The periods outlined for the purposes of this study are: (1) Valdivia/Late Preceramic; (2) Chorrera / Chavin de Huantar; (3) Bahia-Guangala / Moche; and (4) Manteño / Chimu-Inca.

The four periods (outlined above) will be compared to each other using both the data from this study and the contextual information of the four periods. The motivation, mode, and intensity of trade, will be used as criteria to establish the level of intensification and specialization of the exploitation and trade of this resource. It is hoped that this will yield results concerning any trends and intensification in the exploitation and trade of Spondylus within the culture. It is also hoped that this study will help in understanding how integrally linked to the economy of the area was the trade of this resource at different times (H13) The type of Spondylus trade fluctuated in order to accommodate the everchanging socio-political development of the central Andes and the north coast of Peru.

It is expected that the trade of Spondylus through the central Ecuadorian coast changed in order to accommodate the demand from the ever-changing socio-political development of the Central Andes and the north coast of Peru. Hence, we expect to see different types of trade based on the different demand types offered through the years by the consumers of this resource.

The Data Set

As stated above, the data set was compiled through a review of sources that included books, academic papers, archeological site reports, and any published material in which the presence of Spondylus in an archaeological context is recorded.

While creating the data set, several problems arose from the nature of the data. Most of these were due to inconsistencies in the reporting of Spondylus remains by authors. Foremost, is that most authors only identify Spondylus to the species level, leaving the distinction between calcifer and princeps unspecified. Another problem was due to large irregularities concerning the reporting of either ritual, utilitarian or workshop context. Many authors only cite the presence of the resource with little specificity to the manner in which it was used.

Another problem that needs to be addressed is that, while most authors did reference the sites mentioned in their work, several fail to cite the Spondylus sites they discuss. Wherever possible

the secondary sources from which the authors obtained their data where double-checked.

Perhaps the most significant inconsistency was in the reporting of quantities. While most authors do make some type of reference to quantity, they use different measurements. Most use fragment number, while only a few report either MNI or weight. Fragment number proved to be a problematic method of measurement of Spondylus. This is primarily because while a great number of beads from one necklace could be counted as over a hundred fragments in one site, another site might count the same quantity as only one necklace. For this reason, in analyzing the frequency of occurrence, quantities could not be used. Instead, the study uses frequency of Spondylus sites in any given area in order to establish the frequency of occurrence.

On the other hand, every case used in the data set specified a cultural context that could be tied to a period and location. Thus, the study will use period, location and spatial distribution as the primary tools of analysis.

The data set itself constitutes 65 sites separated into four periods. In all of these sites Spondylus was present either ichnographically, as partial or as a whole shell. Table 1 lists all the sites used in the data set, their period, location and where are they referenced.

If we consider the population size to include all the pre-Columbian sites that ever acquired Spondylus, then a total sample size of 65 can be regarded as small. However, if we consider the population to be the total number of excavated sites where Spondylus has been identified and recorded in the academic literature, then a sample size of 65 becomes very significant. It should be noted that the sample at hand is an almost complete list of the sites mentioned in the academic literature dealing with Spondylus in cultural context. Thus, at its very least, it represents the academic literature of this subject. With this in mind, it should be noted that the data set is not a random sample because it reflects the focuses and priorities of the academic literature.

Site Name

Period

Location

Citation Data

Loma Alta

1

2

In Paulsen (1974:599).

Cerro Narrio

1

5

In Paulsen (1974:599) and in Marcos (1977/1978:107-108). ALSO in Marcos & Norton (1981:141). ALSO

La Libertad(1)

2

1

In Paulsen (1974:601).

Chavin The Huantar

2

9

In Paulsen (1974:601). ALSO in Burger (1984a:257).

Malpaso

2

8

In Paulsen (1974:601).

O-6 (Jambeli) Â

3

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4

In Paulsen (1974:602).

Cerro de Trinidad (Chancay)

3

8

In Paulsen (1974:602).

Pinilla

4

8

In Paulsen (1974:603).

Pikillaqta

4

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9

In Paulsen (1974:603).

Pachacamac

4

8

In Paulsen (1974:603).

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La Libertad (2)

4

1

In Paulsen (1974:603).

Real Alto

1

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1

In Marcos (1977/78:108). ALSO In

Marcos & Norton (1981:140). ALSO

in Zeidler (1991:254).

Chauillacamba (1) (Mayoide)

1

5

In Marcos (1977/78:110). ALSO in

Marcos & Norton (1981:141).

Loma de los Cangrejitos

4

1

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In Marcos (1977/78:111). ALSO in

Marcos (1995).

Cave of the Tallos

1

5

In Marcos (1977/78:114). ALSO in Marcos & Norton (1981:141).

Aspero

1

8

In Marcos (1977/78:114). ALSO in

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Zeidler (1991:258).

Kotosh

1

7

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In Marcos (1977/78:115). ALSO in

Marcos & Norton (1981:141).

Marca Huamachuco

4

7

In Marcos (1977/78:115).

Huari

4

9

In Marcos (1977/78:115,123).

Chan Chan

4

6

In Marcos (1977/78:123). ALSO in

Pillsbury (1996:323).

Puna Island

0

0

In Marcos (1977/78:123).

Santa Clara Island

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0

0

In Marcos (1977/78:123).

La Plata Island (1)

1

0

In Marcos & Norton (1981:146).

La Plata Island (2)

4

0

In Marcos & Norton (1981:146).

La Plata Island (3)

3

0

In Marcos & Norton (1981:147).

Trujillo

4

6

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In Marcos & Norton (1981:148,151).

Chincha

4

8

In Pillsbury (1996:321). Data from

Sandweiss (1992).

G-31

1

1

In Zeidler (1991) pg 254.

San Lorenzo del Mate

1

2

In Zeidler (1991:254). ALSO in

Marcos (1995:112).

San Isidro

1

2

In Zeidler (1991:254). ALSO In Currie

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(1995a:51).

Los Gavilanes

1

8

In Zeidler (1991:258).

La Paloma

1

8

In Zeidler (1991:258).

La Galgada

1

8

In Zeidler (1991:258).

Chauillacamba (2) (Mayoide)

2

5

In Marcos (1995:113). ALSO in Uhle

(1922:235).

Chiguilanchi (Loja)

2

5

In Marcos (1995:114).

Lo Demas

4

6

In Hocquenghem (1995:267).

Cabeza de Vaca (Tumbes

4

4

In Hocquenghem (1995:272).

Incaico)

Rica Playa (tambo)

4

4

In Hocquenghem (1995:272-273).

Cerro Hualtacal

4

7

In Hocquenghem (1995:275).

El Azucar (site 47)

3

2

In Masucci (1995) table.

Lopez Viejo (OMJPLP 15)

4

1

In Currie (1995a:43).

Salango (OMJPLP 140)

4

1

In Currie (1995a:51).

San Pablo

1

1

In Currie (1995a:51).

Valdivia

1

1

In Currie (1995a:51).

Pampa Grande

3

6

In Currie (1995a:54). ALSO in

Pillsbury (1996:321). ALSO in

Shimada (1996:214,239).

Las Vegas (Sta. Elena)

3

2

In Currie (1995b) 11th page of article.

Lambayeque

4

6

In Currie (1995b) 13th page of article.

Batan Grande (La Leche Valley)

4

6

In Currie (1995b) 13th page of article.

ALSO in Shimada (1985:238).

Huaca Tacaynamo (Moche

4

6

In Currie (1995b) 13th page of article.

Valley)

ALSO In Pillsbury (1996:321).

Tomebamba

4

5

In Pillsbury (1996:318).

Calvario de los Incas

4

6

In Pillsbury (1996:321).

Huaca "El Dragon"

4

6

In Murra (1982:269).

Huanchaco

4

6

In Pillsbury (1996:323).

Rio Chico (1)

3

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1

In Martinez (2000). Data from field

session at OMJ PLP 170 (Rio Chico)

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summer 2000. Â

Rio Chico (2)

4

1

In Martinez (2000). Data from field

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session at OMJ PLP 170 (Rio Chico)

summer 2000.

Chorrera

2

2

In Lathrap (1980:51).

Cerro Vicus

4

6

In Richardson (1990:438).

Cerro Blanco (site H)

4

6

In Cordy-Collins (1990:396).

Manchan (Casma)

4

6

In Cordy-Collins (1990:396).

G-54

1

2

In Meggers et al (1965:38).

G-110

2

1

In Meggers et al (1965:113).

La Libertad (3)

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3

1

In Bushnell (1951:62).

Cerro Chondorko

4

7

In Shimada (1985:381).

Farfan

4

6

Peters (2001) Personal

Communication. From field work

(2001) conducted at Farfan.

Atacames (Rio Esmeraldas

4

1

Guinea (1995)

Key for Table 1

Period

0 = Unknown 1 = Valdivia/Late Prececeramic: 3500BC-1500BC 2 = Chorrera/Chavin de Huantar: 1500BC-250BC 3 = Bahia-Guangala/Moche: 250BC-AD600 4 = Manteno/ Chimu-Inca: 600AD-1532

**Location*

- 0 = Central Ecuadorian Coast (island)
- 1 = Central Ecuadorian coast (shore)
- 2 = Central Ecuadorian coast (interior)
- 3 = Central Ecuadorian highland
- 4 = Southern Ecuadorian Coast (shore & interior)
- 5 = Southern Ecuadorian highlands
- 6 = Northern Peruvian coast (shore & interior)
- 7 = Northern Peruvian highlands
- 8 = Central Peruvian coast (shore & interior)
- 9 = Central Peruvian highlands

ANALYSIS AND DISCUSSION

Motivating Force (H1, H2, and H3)

One of the primary goals of this investigation was to determine the motivating force behind the movement of Spondylus as seen in the archaeological record. In Chapter Three, three hypotheses were presented representing the three possible motivating factors outlined by Murra (1982): market exchange, redistribution, or core/periphery dependence. Figures 6, 7, 8, and 9 show the spatial distribution of sites containing Spondylus remains in each of the four outlined periods. The spatial distribution of the sites in Period 1 (Figure 6) taken in conjunction with the contextual information of the period support the proposition that Spondylus was acquired in Peru through market exchange (H1). Richardson (1994:60) notes that the most likely political organization of late Preceramic coastal Peru consisted of small communities organized on the bases of family kin groups. However, Spondylus fragments are found sporadically in Period 1 throughout Peru, from the site of Kotosh to the southern site of La Paloma spanning a distance of over 450 km. Since there is no archeological evidence that this vast region formed part of a unified polity (Richardson 1994), redistribution (H2) is not a likely possibility since it requires a strong level of centralized authority capable of redistributing the resource. Furthermore, the relatively equal level of socio-political complexity between the core/periphery dependency (H3) as a possibility. Hence the spatial data and contextual information of Period 1 supports a scenario in which Spondylus was probably acquired at the local level through a series of informal transactions for other valuables or commodities.

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Period 2 offers a different scenario. During this period the presence of the Chavin influence can be interpreted as the centralized authority necessary for redistribution. Even though the actual political implications of the Chavin cult are as yet imperfectly understood, we can note its wide geographical spread (Lumbreras 1974:55-80). This vast territory, which included almost all of coastal and highland Peru, does encapsulate the two Spondylus sites present for this period (Fig.7). However, the miniscule numbers of sites available in this period are not enough to either nullify or support market exchange (H1) or redistribution (H2). A review of the literature found that in this period (1500 B.C. to 250 B.C.) only Chavin de Huantar and Malpaso contained Spondylus remains in Peru. Furthermore, the information regarding the quantities is also

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ambiguous. In Chavin de Huantar, Burger (1984a:257) notes that his excavations unearthed two caches totaling 53 fragments of *Spondylus princeps*. In Malpaso, Paulsen (1974:601) describes an unspecified quantity of cut *Spondylus* shells, dated between 950 and 650 B.C., found atop of a small pyramid. The rarity of this resource in this period can also be interpreted as evidence that redistribution did not take place. Even though Chavin de Huantar can be interpreted as a political center, if redistribution was taking place one would expect to find *Spondylus* in multiple sites surrounding the center. Instead, in Period 2, *Spondylus* only appears in one other site, Malpaso, some 260 km away. However, this still is just negative evidence. Concerning how did the *Spondylus* reach Peru, there is no archaeological evidence that the Chavin influence ever encapsulated coastal Ecuador (Lumbreras 1974). This sustains the proposition that *Spondylus* was brought to Peru by some type of commercial exchange (H1) where *Spondylus* was traded for other valuables or commodities. Once in Peru, the relationship between the two sites that have this resource is unclear. Finally, concerning a core/periphery dependency (H3), the small amounts found in Peru during Period 2 are not representative of an exploitative core which attracts the resource. Hence the spatial data rejects H3. I can conclude that during Period 2 *Spondylus* were brought into Peru through some type of commercial exchange. Once in Peru, it is unclear from the spatial data whether or not Chavin served as a center of redistribution for the resource. However, it must be noted that the lack of surrounding *Spondylus* sites and the general absence of *Spondylus* in this period appear to make the case that Chavin did not serve as a redistribution center.

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The spatial site distribution of Period 3 (from 250 B.C. to A.D. 600) can be seen represented in Figure 8. Like Period 2, during Period 3 in Peru there are only two sites that possess *Spondylus*. However, the two sites of Period 3 clearly belong to two distinct culture groups and polities. One of the sites is located in the Moche valley and belongs to the Moche culture, while the other, Cerro Trinidad, is in the boundaries of the Lima culture (Lumbreras 1974:94). Hence, the spatial data and the contextual information support the argument that *Spondylus* reached the different sites in Peru through some form of commercial exchange (H1) because there is no sufficiently large polity encapsulating these two sites that could account for redistribution (H2). Also, like Period 2, the relative rarity of *Spondylus* during Period 3 in Peru is not representative of an exploitative core which consumes large quantities of this resource. Hence, the spatial data presented in Figure 8 rejects a core/periphery dependency (H3).

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By contrast, the spatial site distribution of Period 4 (600 A.D. to 1532), which can be seen represented in Figure 9, does show a great number of sites in Peru all contained within the boundaries of a large centralized governing body. From 700 A.D. to 1532 the central and northern coast of Peru was continuously encapsulated by successive polities (Lumbreras 1974) capable of accounting for redistribution. The Wari Empire (700 A.D. to 1100) followed by the Chimu State (1100 A.D. to 1470) and finally the Inca Empire (1470 A.D. to 1532) are all sufficiently centralized governing bodies to account for the large scale movement of goods seen in this period. In relation to the other periods, Period 4 shows a dramatic increase in the occurrence of this resource. The number of *Spondylus* sites found in this period is so large that

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Period 4 alone accounts for 71% of all the Spondylus sites found in Peru. Even more significant is that, of all those sites, 65% were of Chimu context. Furthermore, if we consider the Chimu capital (Chan Chan) to be the center for redistribution, we can note the presence of surrounding sites (not seen in Period 2 at Chavin) that one would expect to find near a redistribution center. This is illustrated in Figure 10. Hence, even though market exchange (H1) could still be occurring,

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Period 4 is the only period where both the contextual information and the spatial distribution can really support the occurrence of redistribution (H2). Also, it is in Period 4 for the first time that we see the number of Spondylus sites in Peru exceed the number of sites in Ecuador (23 vs. 8). Simultaneously, the Chimu state does show a higher degree of complexity than its contemporaries in the central Ecuadorian coast. For this reason, Period 4 is also the only period where the case for a core/periphery dependency (H3) can be made. Since the actual level of contact between the Chimu and central Ecuador is not yet completely understood, one cannot say for certain that the two polities fit a core/periphery model. Rather, the findings of this study imply that if the case is made for this type of relationship, it is only during Period 4 that the necessary contextual information and spatial data is present.

By using spatial site distribution and the contextual information of each of the proposed periods, it can be postulated that Spondylus was acquired in Peru through a series of informal transactions that involved some type of commercial exchange (H1) throughout Periods 1, 2, and 3. It is not until Period 4 that the necessary redistribution infrastructure is present to sustain the probability for redistribution (H2). It is also not until Period 4 that a core/periphery relationship (H3) becomes possible according to the spatial and contextual data. Hence, through this analysis we can note that the large movement of this resource that was witnessed by the Spanish upon their arrival (Murra 1982) appears to have been motivated traditionally by simple exchanges and only recently (Period 4) by an organized effort at redistribution.

Mode of Exchange (H4, H5, H6, H7, H8, H9, and H10)

The spatial distribution of Spondylus sites for Period 1 (Figure 6) and the contextual data of the period support the claim that Spondylus reached Peru through down-the-line mode of exchange (H6). The extensive distribution of Spondylus, which even appears in the archeological site of La Paloma over 1,200 km away from the central Ecuadorian coast rules out reciprocity home based (H4) and boundary (H5) as possible modes of exchanges because they involve transactions with adjacent culture groups (Renfrew 1975). During this period, the most likely political organization of late Preceramic coastal Peru consisted of small communities organized on the bases of family kin groups (Richardson 1994:60). Yet, as can be seen in Figure 6, Spondylus fragments are found throughout Peru over an area larger than 450 km. Since there is no archeological evidence that these vast regions formed part of a unified polity, the most likely mode of exchange for the movement of this resource is successive transactions between many neighboring communities throughout the region, allowing the resource to move great distances without an organized effort. Furthermore, when the frequency of Spondylus sites are plotted

against the distance from source, the resulting data points fit into the down-the-line curve proposed by Renfrew (1975). Figure 11 illustrates the decrease of Spondylus site frequency as distance from source increases and Renfrew's down-the-line curve. The plot illustrates the minimal number of Spondylus sites in the consumer area (Peru) compared to the producer area (Ecuador) that is characteristic of down-the-line exchange. Finally, the spatial data also rejects central place redistribution (H7), central place market exchange (H8), and port-of-trade (H10) since they all involve the presence of a stratified governing body and some type of redistribution center with a high frequency of site occurrence. Instead, in Period 1 the sites are evenly spread out at regular intervals with no major redistribution center, and no major polity encapsulating them.

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In the same manner, the most likely mode of exchange for Period 2 is downthe-line (H6) exchange. Figure 12 illustrates how the frequency in occurrence of sites decreases as distance from source increases. Renfrew (1975) notes that this punctuated decrease is characteristic of down-the-line exchange and is represented in the illustrated curve. The extensive distribution of Spondylus, which reaches over 1,200 km in distance (at the site of Malpaso) from the center of production (central Ecuadorian coast), rules out reciprocity home based (H4) and boundary (H5). Paulsen (1974) has pointed out that the iconographic representation of a Spondylus princeps in the Obelisk Tello during this period should be seen as evidence that Spondylus was an important resource in Chavin de Huantar. Burger (1984a:257) also notes that his excavations unearthed two caches totaling 53 fragments of Spondylus princeps at Chavin. However, it should be pointed out that a literature review for this study found only a minimal number of sites containing Spondylus in Peru through this period (1500 B.C. to 250 B.C.). In fact, of all the sites containing Spondylus in Peru that were used for this study, only 6% (n=2) belong to Period 2. Although Chavin de Huantar can be interpreted as a political center, if redistribution of this resource took place one would expect to find a redistribution infrastructure in the shape of multiple Spondylus sites surrounding the center. Instead, in Period 2, Spondylus only appears in one other site, Malpaso, 260 km away. Even though the case can be made for the significance of Spondylus ritualistically or ichnographically (Paulsen 1974), the spatial data suggest that Spondylus was not being redistributed or formed a significant part of Chavin's economy (H7, H8, and H10). Instead, the spatial data and lack of site frequency in Peru (Figures 7 and 12) is representative of down-the-line trade and suggests that Chavin was just a stop along a down-the-line (H6) route.

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The frequency of Spondylus sites for Period 3 suggests that the mode of exchange working through Period 3 was also down-the-line trade (H6), where the number of sites containing Spondylus drastically decreases from where the trade begins. Figure 13 illustrates the decline in site frequency as distance from source increases. This period also has sites distributed over great distances (over 1,100 km), thus ruling out reciprocity home based (H4) and boundary (H5) as possible modes of exchange. Finally, Period 3 also exhibits no significant clustering of sites or redistribution center. Instead, there are only two relatively equal sites spread out at regular intervals making the spatial data more representative of down-the-line (H6) than either central

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place redistribution (H7), central place market exchange (H8), or port-of-trade (H10) where one would expect to see a marked increase in the frequency of sites where the center of redistribution is.

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Contrasting with the earlier periods, Period 4 is the only one to show all the spatial attributes that are associated with directional trade (central place redistribution (H7) market exchange (H8), or port-of-trade (H10)). Foremost, it is only during Period 4 that the number of Spondylus sites in Peru exceeds those in Ecuador. As noted earlier, while the number of Spondylus sites in Ecuador remains relatively constant with only 8 sites, Spondylus sites in Peru jump to 23, more than ten times the number of sites of the earlier period. Peru appears to undergo a dramatic change with respect to its relationship to Spondylus during this time. Period 4 alone accounts for 71% of all the Spondylus sites found in Peru. Even more significant is that of all the Spondylus sites found during this Period in Peru, 65% (12) are clearly of Chimu context. When we consider Chan Chan as the political center of the Chimu State, we can note the clustering of surrounding Spondylus sites around this area. Figure 9 shows the spatial distribution of Spondylus sites during this period. When the frequency of Spondylus sites is plotted against distance from source (Figure 14) we can see a marked increase or “peak” in the frequency of sites where a central place is located. This frequency distribution is clearly characteristic of Renfrew’s directional trade (1975), which includes central place redistribution (H7) market exchange (H8), port-of-trade (H10). Thus, Period 4 is the only period for which there is a real “redistribution” or “central place” type of infrastructure present to support the claim that Spondylus was being re-directed and redistributed. However, when the contextual information of the period is taken into account and one considers that the center of this redistribution hub is the Chimu capital of Chan Chan it becomes clear that this is not a neutral place, thus ruling out port-of-trade (H10) as a possible option. Figure 15 shows a close-up of this “hub” with 50 km intervals and Figure 16 shows the gradual decrease in site frequency as one moves away from this “hub.”

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This type of gradual decrease around a peak is characteristic of Renfrew’s (1975) “central place.” Hence, the spatial data of Period 4 strongly supports the presence of some type of central place distribution, either through political redistribution (H7) or through internal market exchange (H8) in the northern coast of Peru during its Chimu phase. It should also be pointed out the presence of a second, smaller “hub,” in the southern coast of Peru during this period. Regarding most of the sites found in this “hub” Sandweiss (1992) has noted that the Spondylus found here are representative of Chincha merchants and only appear late and only during Inca context. Hence, this smaller hub appears to correspond to the later period after the demise of the Chimu at the hands of the Inca, when the Chincha took over the redistribution of this resource after the collapse of Chan Chan. The frequency of this smaller second hub can also be seen represented in Figures 14 and 15.

From the spatial data it is difficult to ascertain whether or not emissary trading (H9) was taking place. The narration of the historical balsa reported by Pizzaro (1844) certainly presented a culture that is in accord with this hypothesis. It had the division of labor necessary to allow for a specialized group solely in charge of moving this good to faraway lands. Hence, through ethnographic sources (Murra 1982; Rostworowski 1970) we can conclude that by Period 4 emissary trading (H9) was taking place. However, at what point this form of movement of goods began remains unclear from the available data. As will be noted in the next section, the large gaps between the central Ecuadorian coast and the Spondylus sites of Peru warrant the possibility that the resource was being moved through a maritime route and therefore by a “maritime industry” as early as Period 1. However, the minimal amounts found in Periods 1, 2, and 3 lead to the inference that even if emissary trading was taking place during the first three Periods, at least concerning this one resource, it does not appear to have been a major industry worthy of allocating an entire labor group for its distribution.

Thus, the spatial data in conjunction with the contextual information support the claim that for the first three periods, Spondylus were traded by a series of informal successive exchanges between neighboring groups or down-the-line trade (H6). It is not until Period 4, during the Chimu phase, that we see the appearance of the characteristic “central place” with the associated redistribution infrastructure in the shape of multiple surrounding sites. Even though the contextual data is not available to allow us to know if Spondylus were moved in the Chimu state through political redistribution (H7) or through internal market exchange (H8) it is clear that the Chimu were responsible for the largest organized movement of this resource in Peru.

Route of Spondylus Distribution (H11 and H12)

For all of the four periods outlined in this study, the archaeological data supports the claim that the resource was distributed through a maritime route (H12).

Figure 6 illustrates the spatial distribution of sites during Period 1. Of the five Spondylus sites present in Peru, three fall directly on the shore and one in close proximity to it. Only the site of Kotosh is located some 250 km away from the shore. There is also a large gap of over 500 km between the southernmost Ecuadorian site (at the Cave of the Tallos) and the northernmost Peruvian site (Kotosh).

For Period 2, even though we only have two Spondylus sites in Peru, one in the coast and one near the highlands, we can see a large gap of over 700 km where no sites appear (Figure 7). This substantial paucity of sites supports a maritime route for the transfer of Spondylus because if they were moved by a terrestrial route one would expect to see a continuous distribution throughout Ecuador and Peru.

Period 3, on the other hand, does not show the marked gap present in the earlier periods (Figure 8). However, during this period all the sites present in Peru are coastal and there are no highland sites in either Ecuador or Peru, forming perhaps the best available evidence for a maritime route.

Finally, while Period 4 (Figure 9) does show the necessary continuity of sites, both in the highlands and through a coastal terrestrial route, the overwhelming clustering of sites towards

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the ocean strongly support a maritime route. In Peru, during this period, 78% of all sites are on or near the coast, with only five sites in the highlands. If Spondylus were being moved through a terrestrial route, it would seem unlikely that they would cluster so overwhelmingly near the shore. Furthermore, the continuity in sites between the central Ecuadorian coast and north Peru can be explained when we consider the proximity of the Chimu State to the central Ecuadorian coast. If, as proposed in the previous section, the Chimu were the principle redistributors of Spondylus, one would expect to see multiple peripheral sites radiating from Chan Chan, the center of redistribution (Figure 15). In this manner, the sites between south Ecuador and Chan Chan, the highland sites, and the southern site of Manchan can be interpreted as peripheral to Chan Chan. This is illustrated in Figure 17. With the same logic, if Chinchipe is a smaller secondary "hub" (as proposed in the previous section) the coastal and highland sites near Chinchipe can also be interpreted as peripheral sites. This is also illustrated in Figure 17.

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Even though it is possible to interpret the highland sites found sporadically throughout the periods as part of an ancient terrestrial route (illustrated in Figure 18), it seems unusual then that Spondylus would be so absent in the highlands. If the large quantities of Spondylus necessary to supply Chan Chan made the long terrestrial trip to the highlands on a regular bases, it would be expected that they would have left their mark in more significant ways. Instead, of all the sites found in Peru throughout the four periods, only 22 % were not on the coast. Furthermore, a maritime route seems more likely when taking into account that the cultures that acquired this resource from the sea had longstanding maritime adaptations (Marcos 1985). It seems unlikely that cultures with the ability to acquire this resource through the use of divers and balsas rafts would have to move the resource to the Ecuadorian highlands, down to the Peruvian highlands, so they can be finally brought all the way back to the Peruvian shore.

The Evolution of Spondylus Traffic Through Time (H13)

The final goal of this investigation was to analyze the trade of Spondylus from a temporal perspective in order to discern any patterns in its evolution over time. This is done through a comparison of the motivation and mode of trade, the different Spondylus types, the spatial site distribution, and the frequency of sites per period.

A comparison of the four periods shows that the traffic of Spondylus remains relatively small and unsophisticated throughout most of its existence. Periods 1, 2, and 3 are all characterized by low site frequencies outside of the Ecuadorian coast. Of the sites in Peru used for this study, only 16% belong to the Period 1. Periods 2 and 3 have even lower frequencies, each accounting for only 6 % of the sites found in Peru.

In the same manner, the spatial site distribution of Periods 1 to 3 suggests that through the first three periods, Spondylus reached Peru by means of down-the-line trade. The data also suggest that the motivating reason for the movement of this resource was a series of small scale informal transactions between neighboring communities in which Spondylus was traded locally

for other valuables or commodities.

The utility of Spondylus also shows a similar pattern. Through the first three periods, Spondylus is found overwhelmingly for ornamental purposes. Zeidler notes that in Period 1, those found in "Los Gavilanes ... Aspero ... La Paloma ... and at the inland site of La Galgada... [are] ... usually solitary finds of Spondylus fragments or finished ornaments..." (Zeidler 1991:258). In Period 3, the site of Cerro Trinidad (Chancay) included a necklace of 48 Spondylus beads, and about 200 more formerly sewed to a headdress, some Spondylus necklaces [and] spreaders" (Paulsen 1974:602).

On the other hand, Period 4 shows a dramatic transformation in almost every aspect of the trade of this resource. Foremost, is the explosion in site frequency outside Ecuador, Period 4 accounts for 71% of all the Spondylus sites found in Peru used in this study. The number of Peruvian sites increases to more than ten times the number of the previous period.

Period 4 is also the only period in which the spatial data (seen represented in Figures 9, 14, and 15) can support the existence of an organized redistribution center (Chan Chan) responsible for moving large quantities the resource. It is important to note the clustering of sites around the Chimu State seen depicted in Figure 15.

Period 4 also offers a flowering of new Spondylus forms previously not seen in Peru, which include burned and powdered Spondylus. The appearance of whole shells also becomes predominant in this last period. This can be seen as a change in the way of thinking about the shell. While the form of the artifacts in earlier times (necklaces, beads, headdress, spreaders) suggests that it was coveted because of its beauty and thus used for ornamentation, the later forms (as whole shell or in powdered form) suggests that the shell itself became intrinsically important.

Finally, Period 4 also presents an explosion in the iconographic representation of the bivalve. Before Period 4, the shell was largely un-represented in the iconographic record, the only exception being its depiction at Chavin de Huantar (Paulsen 1974). However, with the appearance of Chan Chan, it appears prominently represented in ear spools, murals, plates, Huacas, textiles, etc. (Cordy-Collins 1990, Pillsbury 1996).

Thus, a comparison of the motivation and mode of trade, the different Spondylus types, the spatial site distribution, and the frequency of sites per period strongly suggests that the trade of Spondylus did not follow a gradual development over time. Instead, it appears to be a punctuated explosion that coincides both geographically and temporally with the emergence of the Chimu state.

GENERAL CONCLUSIONS

Murra (1982) noted that historical and ethnographic reports, from the time of Spanish contact and shortly after, describe the importance of Spondylus to the economic and ritualistic life of the indigenous inhabitants of South America. His observations have prompted researchers to focus their attention on the archeological record in order to validate the significance already presented in historical accounts.

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The wide temporal distribution of Spondylus in the archaeological record has led some researchers to propose that the ritualistic attributes of Spondylus have very early beginnings that can be traced back to civilizations as ancient as Chavin de Huantar (Paulsen 1974, Zeidler 1991, Marcos 1995). The findings of this study suggest that while the shell is found in Peru as early as the Peruvian Pre-ceramic, the widespread ritualistic and economic complex seen by the Spanish upon their arrival had very recent beginnings. In fact, sufficient evidence is presented to propose that its large scale redistribution and its ritualistic attributes first appear during Moche V, and from then on become highly correlated with the presence of the Chimú State, both geographically and temporally.

As described in detail in Chapter 4, the evolution of the complexity of Spondylus traffic can be better understood by comparing the different motivating forces, modes of trades, shell forms, frequency of sites, and spatial distribution of the four periods proposed for this study. Table 2 summarizes the finding of this study and separates them according to period.

As Table 2 shows, the traffic of Spondylus remains constant throughout most of the sequence as a series of informal commercial transactions performed by neighboring communities or individuals. The resource covers a large area through unorganized down-the-line trade where neighboring communities trade the resource sequentially until it proliferates without any organized attempt at its movement.

It is not until the Chimú phase in Period 4, that the traffic of Spondylus appears to undergo a dramatic revolution. It is here that we see the only real evidence of an organized distribution infrastructure, first around Chan Chan and later around Chíncha (depicted in Figures 9, 14, and 15).

Furthermore, it is in this period for the first time that we see the number of Spondylus sites in Peru drastically increase from what had been present in the previous two periods (from 2 to 23 sites). It can also be pointed out that there is not a steady increase in the number of sites containing Spondylus in Peru throughout time. Instead, what we see is a steady minimal number of sites throughout the first three periods and a punctuated burst in the appearance of sites in Period 4. In this study, while Periods 1, 2, and 3 account for only 16%, 6%, and 6% of all the Peruvian sites respectively, Period 4 alone constituted 71% of all the Spondylus sites found in Peru.

Even more significant is that of all the Spondylus sites found during Period 4 in Peru, 65% (12) are clearly of Chimú context. When we consider Chan Chan as the political center of the Chimú State, we can note the clustering of surrounding Spondylus sites around this area. Figure 9 shows the spatial distribution of Spondylus sites during this period. The frequency of Spondylus sites against distance from source (Figure 14) shows a marked increase or "peak" in the frequency of sites where a central place is located. This frequency distribution, which is very characteristic of Renfrew's directional trade (1975), only appears during Period 4.

Also, the utilitarian purposes of Spondylus appear to change dramatically during this last period. As stated in Chapter 4, in earlier periods Spondylus appears to have value primarily because of its aesthetic beauty. Period 4, however, is marked by the appearance of ritual forms and contexts. For example, of the five sites found in Period 1, those of Los Gavilanes, Aspero, La

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Paloma, and La Galgada where usually solitary finds of Spondylus fragments or finished ornaments (Zeidler 1991:258). Paulsen (1974:601), during Period 2, notes that the Spondylus found in Malpaso were in fragments and cut. In Chavin, the Spondylus found are reported to be in fragments (Burger 1984:257). This suggests the importance of the material rather than the shell itself. At the site of Cerro Trinidad (Chancay), during Period 3, the Spondylus found were overwhelmingly for ornamental purposes. They included Spondylus necklaces, spreaders, beads, and about 200 fragments formerly sewed to a headdress (Paulsen 1974:602). Here, the presence of one whole mature Spondylus shell, smoothed and ground, must be noted, because it could constitute the first evidence of the shell as intrinsically important. That is to say that while the form of the artifacts of the earlier periods (necklaces, beads, headdress, spreaders) suggest that it was coveted because of its beauty and thus used for ornamentation, the forms present in Period 4 (as whole shell or in powdered form) suggest that the shell itself was intrinsically important. It is during the end of Period 3, specifically during Moche V and in the Moche valley that we see the beginnings of its use for ritualistic purposes that would later be reported in historical accounts (Murra 1982). For example, Shimada (1996:214) describes that the Spondylus found in Pampa Grande, belonging to Moche V and onwards, was of great quantity and included ritualistic and workshop contexts. He also reports the presence of both worked and whole shells and iconographic representations (239). Regarding Spondylus exploitation, he writes that it "seems to originate with Moche V [when] power shifts to the northern end of the north coast and the inferred intensification of the trade with coastal Ecuador" (Shimada 1996:213). Coincidentally, it is also during Moche V that Donnan (1999) notes that appearance of the funerary ritual in Moche iconography where the "giving of the conchs" is introduced.

All of this serves as prelude for Period 4 where not only does the Spondylus site frequency boom, but also the type of uses of the shell diversifies. During Period 4, even though the mollusk is still commonly used for ornamentation, we see a variety of new forms introduced. Murra (1982) reports that historical sources describe the indigenous populations at the time of the conquest using Spondylus in whole and powdered form as offerings in burials and rituals. Yet, powdered Spondylus, even though frequent in the Chimu sites of Period 4, does not appear in any of the sites used in this study in the three earlier periods. Also, it is only during Period 4 that whole Spondylus becomes a common occurrence outside Ecuador, especially in ritual context. For example, at an excavation in the Chimu site of Farfan whole Spondylus were usually associated with elite burials (Eric Peters, personal communication). This practice, even though not present in any of the Peruvian sites used in the first three periods, becomes a common phenomena in Period 4, especially in the Chimu State. Currie (1995b:54) notes that "huge quantities of Spondylus, whole, worked, powdered and burned... [were]... found in rich burials from Late Intermediate sites from the valleys of the La Leche, Lambayeque and Moche." Period 4, unlike earlier periods, is also characterized by the diversification of context that the shell is found in. While in Periods 1 to 3 the shell was only ornamental or in caches, in Period 4 it is also found in workshops, burials, burned offerings, etc. One can also notice an "iconographic revolution" in the representation of Spondylus, which under Chimu contexts becomes depicted in ear spools, murals, plates, Huacas, textiles, etc. (Cordy-Collins 1990, Pillsbury 1996). Prior to Period 4, in Peru, the only iconographic depiction of Spondylus is at Chavin de Huantar. Finally, as proposed in the previous sections, it is only through Period 4 that we can see a genuine redistribution infrastructure present that is substantial enough to consider

that Spondylus acquisition and redistribution was linked to the region's economy.

When all of this is taken in conjunction with the increased frequency distribution seen in Figure 9 it can be postulated that the evolution of Spondylus was not in fact a gradual intensification of the exploitation of the mollusk. Rather, the wide use of this resource reported from the ethnographic record appears to have a much more recent origin. The ritualistic implications of the shell appear to originate in the Moche Valley with Moche V. Shortly thereafter, in the same region, it continues with the Chimu, who exploit the resource for increased ornamental, iconographic, ritualistic and economic purposes. The Chimu apparently redistributed this resource in mass until their demise at the hands of the Inca in 1470, when Sandweiss (1992) notes that, only under Inca contexts, it appears in Chincha sites which apparently took over the distribution rights of Spondylus for the next 62 years.

Thus, the analysis of Spondylus spatial distribution over time strongly suggests the need for rethinking previous conceptions of this resource. To date, most studies have centered around the supposition that the economic and ritualistic importance of Spondylus was a Pan-Andean phenomena with origins as ancient as Chavin de Huantar and Valdivia (Paulsen 1974; Marcos 1995). However, the relative paucity of this mollusk in the archeological record until its sudden upsurge in the Moche Valley with the coming of the Chimu State indicates that the valuable and ritual nature of Spondylus described by Murra (1982) in his ethnographic accounts was a phenomenon of Moche-Chimu origin.

The findings of this study serve as good indicators of the direction of future studies, particularly with regards to the strong correlation between Spondylus exploitation and Moche and Chimu cultures. However, the findings presented here should be seen as preliminary and requiring stricter levels of objectification and quantification. Consistency in reporting species, contexts, fragment counts, MNI, weights, and the creation of a larger, more objective sample group, are crucial elements needed in order to properly quantify the data.

However, once the quantitative problems have been addressed, it is hoped that studies can concentrate on answering the contextual questions surrounding this bivalve. Specifically, why did it acquire such strong ritualistic and economic attributes in Moche V and on to the Chimu State? And, was this ritualistic importance imported from the Ecuadorian coast or did it occur autonomously in Peru?

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