Late Prehistoric Economy and Society of the Islands off the Coast of Venezuela: A Contextual Interpretation of the Non-Ceramic Evidence

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Abstract

Archaeologists have portrayed north-central Venezuela as the seat of the Valencioid 'chiefdom' (a.d. 900-1500) and assumed socio-cultural continuity between the Valencioid culture and the historic *Caraca* Indians. These assumptions have neither been constructed nor tested on socially meaningful archaeological contexts.

My research formulates and tests the cognitive value of the non-ceramic evidence recovered from socially meaningful archaeological contexts on the islands of the Central Coast of Venezuela as sources for understanding the developmental trajectory of the Valencioid polity(ies).

The data come from archaeological surveys and excavations on 55 offshore islands and at 47 sites. Through horizontal excavation, off-site control units and statistical control over sample size it is established that the economic purpose for the occupation of a large Valencioid campsite at Dos Mosquises Island (a.d. 1400-1500) was primarily to exploit Conch Shell (*Strombus gigas*) for food and raw material. Other local resources, such as fishes, lobsters, turtles and birds, were complementary. The conceptual polarity food/artefact, often applied to the archaeofaunal analyses, is replaced by contextual discrimination between food, non-food remains and natural objects, which leads to inferences on social group composition, labour division, specialisation, differential access to food and the exportation of shell raw material outside the islands.

The results of the contextual analyses of allochthonous mammal and special purpose artefacts indicate the presence of prominent members of the society (chief, shaman and/or warriors) and the ceremonial character of the core locus at the Dos Mosquises site. It is suggested that the organisation of the insular enterprise is most likely controlled from this core locus.

From a macro-regional perspective, the resulting analyses challenge the notion of a 600 year-long unilinear evolution toward social complexity of the Valencioid polity. The previous view of a straightforward, hegemonic character of this polity is replaced by perspective of recurrent long and short-term changes in the nature and intensity of regional interactions between several polities. These interactions were based on a changing multilateral negotiations of power through trade, co-operative ventures, resource exploitation, intermarriage, ceremonial assistance, warfare and peace. The purported continuity between the insular Valencioids and the *Caraca* Indians is not supported by the archaeological data.

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Introduction

North-central Venezuela is one of the most outstanding regions in South America in terms of ecological diversity, depth and continuity of cultural history, and the richness and abundance of its archaeological deposits. From north to south the region encompasses the chain of oceanic, coral islands, the steep, rocky continental coast, the Cordillera de la Costa with peaks over 2700 metres above sea level, and the Valencia Lake Basin, which encloses the largest landlocked reservoir of fresh water north of the Amazon. To the south, another range of mountains separates the lake from the Orinoco River plains.

The remains of prehistoric societies are particularly abundant in the Valencia Basin. Such artefacts and features as the ceramic figurines, artificial mounds, burial offerings contained in large urns, the practice of cranial deformation, lines of megalithic standing stones, petroglyphs and gold artefacts found in this region captivated the attention of scholars, explorers and looters since the 1870s. The Valencia Basin antiquities were presented to the international public as early as in 1889, at the Universal Exposition in Paris, stimulating a long-lasting and vigorous debate about their origins. Until the 1930s, when the region underwent its international archaeological 'boom' (Chapter 2), these debates had a rather speculative character. During the next 20 years the framework for regional cultural chronology (used until the present), was set down.

The cultural history of north-central Venezuela can, probably, be traced back to as far as the late Pleistocene (10,000 years b.p.); however, the archaeological evidence indicates that the period of intense cultural development coincided with the arrival of pottery-using farmers at the beginning of the Christian Era. Since that time the cultural core of the region centred on the Lake Valencia shores.

Between a.d. 900 and 1500, this core area was the centre of spatial distribution of pottery in the so-called Valencia style. According to the current set of hypotheses concerning the region's social and political evolution, the extremely favourable natural conditions of the Valencia Basin contributed to demographic growth and, in consequence, to the emergence of a social organisation of 'chiefdom' type during late prehistoric times. Population growth forced the regional polity to assure access to complementary resources from diverse ecological zones outside the core area. In consequence, the spatial distribution of Valencia style pottery in the intermontane valleys (east) and toward the coast (north) has been interpreted as a result of direct expansion (migration) and of indirect contact (coastal villages subjugated by the chiefdom or involved in the exchange network controlled by the chiefdom). A direct relationship between the bearers of the Valencia style pottery and the protohistoric inhabitants of the north-central Venezuela was uncritically assumed by the exponents of regional social evolution hypotheses.

This cultural evolutionary approach as an explanation of social change places causal priority on ecological and economic processes (Feinmann 1995). Unfortunately, the limitations of the data base seriously constrain any reliable theorisation on social/ethnic identification of the Amerindian societies, and on the nature and dynamic of societal interactions. The data that was used for the identification of the north-central Venezuelan Amerindian societies was collected decades ago in response to totally different sets of questions. The early empirical generalisations of the 1930s and the 1950s were aimed at constructing typologies and classifications, seriations and chronological charts, and spatial distributions of the artefacts, mainly pottery. The non-ceramic artefacts, as well as the environmental and contextual data, were almost completely neglected (or not explicitly taken into account) in these studies, a situation that, with a few notable exceptions, continues today. The data gathered to fulfil the aims of those artefact-oriented studies is unsuitable for today's interest in the construction of high level theories, including adaptationalism, evolutionary ecology and structural Marxism (Preucel and Hodder 1996).

In 1980s, systematic archaeological research on the western Venezuelan coast and on the Dutch islands to the north (Aruba, Curaçao and Bonaire), raised the need to include the Venezuelan islands situated off the north-central coast in the emerging archaeological panorama of the region. In 1983 Marlena Antczak and the author created *The Venezuelan Island Archaeology Project* which embraces both the off-shore and inshore islands presently included under the Venezuelan Federal Dependencies (*Dependencias Federales de Venezuela*). The islands of Margarita, Coche and Cubagua, located on the eastern Caribbean coast and belonging to Nueva Esparta State, are the only ones excluded from this project. It should be stressed that only one archaeological report about the islands of the *Dependencias Federales* was available before the current Project began. It was published in the 1950s, as a result of small scale excavations carried out on two islands of the Los Roques Archipelago by a group of naturalists from the *Sociedad de Ciencias Naturales La Salle* of Caracas.

Between 1983 and 1996, during the course of the present Project, more than 50 excavation seasons on the islands have been undertaken. Some lasted only for one week while others were up to four months long. The methods employed include a systematic pedestrian survey, and surface and shovel sampling of each island, as well as random and non-random sampling in tests. 72 islands were surveyed and 45 prehispanic sites located. At nine sites, systematic 'block' excavations have been carried out. Fine sieving (1 mm^2 mesh) designed to recover archaeofaunal remains was employed. In addition, comparative collections of local faunas were created and data about contemporary traditional fishing practices collected.

The broader approach of the Project has been quite cultural-historical in its philosophy. One of its main goals was to generate, from the insular perspective, hypotheses concerning the chronology of the spread of the bearers of the Amerindian potteries from the mainland coast into the islands, and to check ideas concerning their spread along the coast and also from inland regions to the coast itself.

In this dissertation the archaeology of 30 islands situated off the central coast of Venezuela will be discussed, including (from west to east) the archipelagos of Las Aves de Sotavento and of Barlovento, Los Roques and groups of La Orchila and La Tortuga islands. Four different cultural components were identified on these islands: Saladoid, Ocumaroid, Valencioid and Dabajuroid, as well as a group of stylistically undiagnostic assemblages. The Valencia style ceramic assemblages located on Los Roques Archipelago islands yielded, at first glance, the major quantity and diversity of artefacts, with rich contextual information. Therefore, it was expected, that systematic investigations of Valencioid archaeological deposits would yield contextual data that would allow insights into the interrelations between economic, social and ideological aspects of insular societies, and new means to understand the developmental trajectory of the mainland Valencioid polity(ies).

To better accomplish the wide range of questions regarding the archaeology of these islands and to facilitate the operation of the analytical procedures, Marlena Antczak and the author divided their areas of interest. As a result, two pieces of doctoral research were designed and carried out. The inter-insular and island-coast-mainland cultural and chronological interrelationship of Valencioid insular remains are being tested from the 'ceramic' point of view by Marlena Antczak (PhD thesis). She focuses on the assessment of the meaning of human ceramic figurines from the Valencioid insular contexts and constructs the link between them and their probable 'homeland' area on the mainland.

My dissertation is concerned with the non-ceramic evidence left by the insular Valencioids, especially on the tiny Dos Mosquises Island. The evidence was obtained through horizontal block excavation, off-site control units, fine mesh sieving and statistical control over sampling. By taking into account presence, absence, co-presence and co-absence, and also the similarities and the differences which constitute the patterning of the material culture in spatio-temporal context of Dos Mosquises Island (see Halstead et al. 1978; Shanks and Tilley 1987: Hodder 1986; 1887), I was able to determine the techno-economic bases of subsistence, social group composition, labour division and specialisation, differential access to food, as well as the timetable and role of ideological components in insular activities.

The economic, social and ideological dimensions and mechanisms of the insular enterprise are discussed at intrasite, local (inter-insular) and regional (islands/coast/inland) scales and cannot be separated from each other, and from a wide, late prehistoric, interregional north-eastern South American sphere of interaction. If the interpretations discussed in this thesis are not restricted to the insular area but are considered as a step in an ongoing process of investigation and interpretation of north-central Venezuelan prehistory, then the resolution of data obtained on the islands and on the mainland should be compatible. This is, however, not the case, and the overarching goal of this study is to stimulate changes in the objectives and strategies of archaeological research on the mainland, which will enable the compatibility of the corpus of data from both areas.

The first step of the research strategy is to break down the monolithic concepts of cultures (styles and series) which are almost meaningless socially and which operate on long-time periods, and to replace them with concrete trajectories of historically constituted societal formations which work on shorter, and often cyclical, time-scales (see Braudel 1980). The next step is to begin to formulate socially meaningful questions to and direct them to particularly socially appropriate archaeological contexts (i.e. households), with tight control over the qualitative and quantitative characteristics of the samples and their temporo-spatial frames (see Drennan 1996). Multidisciplinary, high resolution contextual archaeological research in the region, in which all observable details of the archaeological context, pertinent to historical and contextual specificity of a prehistoric society are analysed, and several meaningful connections between these evidence assessed, may prevent the reproduction of the present day historical 'social-fictions'.

Part One

On the mainland

Chapter One

The natural environment

North-central Venezuela

The north-central part of Venezuela comprises four main geographic zones: (1) Valencia Lake Basin and valleys of Caracas and Tuy, (2) the Cordillera de la Costa, (3) the Caribbean coast and, (4) the chain of oceanic islands (Figure 1). This region is situated within a semiarid to arid belt that encompasses parts of north-western Venezuela and north-eastern Colombia (Eisenberg 1989). The Valencia Lake Basin and Cordillera de la Costa have a humid tropical climate, while the latter two zones are typical representatives of the semiarid belt. The semiarid climatic conditions on the coast and islands are, in part, a result of the relatively cold marine current that flows westward, along the Venezuelan coast. The dry trade winds which blow during almost all the year from the Northeast produce atmospheric divergence and subsidence that also contribute to the formation of these climatic conditions (Lahey 1973; Schubert 1978).

The microclimate, geology and biotic associations of the first three zones will be outlined in this chapter, while Chapter 5 will include the characteristics of insular environments.

The Valencia Lake Basin

The Valencia Basin is situated in the core geographic feature of north-central Venezuela covering an area of approximately 2,750 km^2 (Schubert 1980). This area embraces the valleys of the River Aragua and pertains administratively to Aragua and Carabobo States. The basin is a part of a tectonic depression that separates two main geomorphologic subdivisions of the Caribbean Mountains: the Cordillera de la Costa to the north and the Serranía del Interior to the south (Schubert 1980).

Lake Valencia, which occupies a central part of the basin, has an extensive sedimentary record dated to the mid-Tertiary (Schubert 1980). However, as has been indicated by palaeolimnological studies of the lake's sediments, from 13,000 to about 10,500 years b.p. the lake was characterized by dry, marshy conditions that could be correlated with a glacial climatic regime that dominated the upper parts of the Venezuelan and Colombian Andes (Bradbury et al. 1981). At about the same time, such conditions as low sea levels and arid climates characterized vast tropical regions stretching from Guyana to Panama. Towards the beginnings of Holocene, about 10,500 years ago, there was a significant increase in the moisture in the Lake Valencia watershed, correlated with the final part of the last glacial period and consequently with the time of rising sea levels (Schubert 1978). Finally, by 8500 years ago Lake Valencia had reached moderate to low salinity; it discharged water and its surroundings were colonised by a modern vegetation (Bradbury et al. 1981).

Lake Valencia is situated at the altitude of 402 masl and its maximum dimensions are 65 kilometres from east to west and 22 kilometres from north to south. The lake has an area of 350 km^2 and reaches a maximum depth of 40 meters (Bradbury et al. 1981). There are several islands scattered on the lake whose metamorphic rock cores represent the crests of submerged ridges that connect the peninsulas (Berry 1939). The islands vary in size from the biggest (such as El Burro or Tacarigua, Otama and Caigüire) to only rocks and sandy banks covered by water during the rainy season. A system of small rivers and streams that fall from the surrounding hills and mountains nourishes the lake. During the rainy season, from May to December approximately, the run-off received by the lake from this internal drainage system is of considerable, but remarkably irregular, amount.

Currently, the lake is an endorheic (nondischarging) reservoir with a spill point at 427 masl (Bradbury et al. 1981[Figure 2]). In 1727 the lake's water rose up as high as the spill point (Cruxent and Rouse 1958: 299) and drained southward, through the Paíto River, and across the Llanos into the Orinoco River (Schubert 1978). This fluvial connection might have been navigated by Amerindian canoes (Cruxent and Rouse 1958).

The significant changes in the level of the water of the lake had attracted the attention of many scholars since Alexander von Humboldt (Jahn 1940; Böckh 1956; Peeters 1968; Schubert 1978; 1980; Bradbury et al. 1981; Leyden 1985; Curtis et al. n.d.). Although these studies vary in terms of applied methodology and differ in conclusions (see Curtis et al. n.d.: 21), two basic ideas remain: (1) the lake has undergone several periods of filling and desiccation, and (2) the levels of the fluctuations have been long-term, short-term and seasonal. There is no doubt that these fluctuations must have had an impact on the surrounding environment, and archaeologists have been searching for the evidence of this impact on the prehistoric settlements of the region. However, few correlation between the archaeological evidence and the geomorphologic features were carried out (Berry 1939; Kidder 1944; Cruxent and Rouse 1958).

Alluvial terraces, that are the remains of former lake shores, surround Lake Valencia. To the east and west from the lake stretch wide plains of fertile soils (*tierra de caracolillo*) which once formed the bed of the lake. These are the best soils in the country for agricultural purposes (Ewel et al. 1976). A few centuries ago these flats were almost completely covered by alluvial savanna and deciduous vegetation but nowadays these areas are being used as arable lands for agriculture, as pasture, or are covered by villages and industrial zones. To the north and south the hills and mountains approach the lake more closely and there are no plains of considerable extension.

To the north-west from Lake Valencia exist few natural paths (*abras*) through la Cordillera de la Costa that facilitate the communication between the Valencia Basin and the Caribbean shore. South from the lake, the hills of Serranía del Interior are considerably lower than the northern chain; the Los Morros hills range separates the Valencia Basin from the Llanos of the Apure and Orinoco rivers.

Nowadays, the Valencia Basin is highly polluted and degraded, being one of the most affected areas in the country. However, for the prehistoric settlers, this region could offer several unsurpassed natural advantages: fertile alluvial soils, diverse and abundant game and diverse vegetation associations, both allocated in a wide range of related ecosystems. Not less privileged is the geographical position of the lake: close to the coast, with natural connection to the western valleys of Caracas and Tuy and, to the south, open for Amerindian canoes toward the Orinoco plains. The beautiful natural scenery of the area should also be stressed; a prominent Venezuelan naturalist of the 19^{th} century, Adolph Ernst (1873) affirmed that the Valleys of Aragua are 'the marvellous garden of Venezuela'.

The Cordillera de la Costa

To the north of the Valencia Basin rises the Cordillera de la Costa mountain chain that separates it from the Caribbean shore. The peaks reach an altitude of about 2000 meters; however, to the east, in front of Valley of Caracas, they rise higher to nearly 2800 masl (Schubert 1978; Pereira Vidal and Aso n.d.).

The slopes of Cordillera de la Costa are an exceptionally low condensatory region that comprises few different life zones conditioned by elevation and humidity. Immediately above the savanna that surrounds Lake Valencia continues the semideciduous and evergreen forest; the higher slopes, situated towards the northern peaks, are dominated by a pristine cloudy forest ecosystem (Bradbury et al. 1981). The cloud forest that begins at the average altitude of 850 masl is near the maximum limit of taxonomic vegetation diversity (903 species), and can be considered as a model of the climax forest. The mountain slope floral associations abound in plants that have for a long time been employed for food, construction, fuel, adornment, medicinal and magic-religious uses. Regarding the animals, especially the vertebrates, the mountain exhibits attributes of a biogeographic island where random extinction and reduced immigration reduced the species richness (O'Connell and August 1979).

The north-central Caribbean coast

Only 25 kilometres of straight line distance separate Lake Valencia from the Caribbean shore. The coastal strip stretching from Cabo Codera (to the east) to Puerto Cabello (to the west) is dominated by the Cordillera de la Costa mountain range whose slopes fall directly to the sea. In two sectors the coast is dominated by cliffs: between Puerto La Cruz and Puerto Cabello (the Western Cliffs) and between Carayaca and Cabo Codera (the Eastern Cliffs). In consequence, the continental platform is very narrow and at a short distance from the shore the sea reaches a great depth. Small bays with sandy alluvial beaches are scattered along the coast (see Schubert 1977; Schubert et al. 1977). The streams and rivers from the mountain drain constantly to the bays that are the only shelters for communities of fishermen.

To the east of Cabo Codera, the mountains retreat southwards from the coast giving place to low and sandy beaches of both sedimentary marine and fluvial origin. Similarly, the coast to the west of Puerto Cabello opens in ample plains with long sandy beaches.

The littoral is exposed to the trade winds from the north-east and the average precipitation in Puerto Cabello area reaches 850 mm; November and July are the months with highest rainfall (Vila 1968: 6). Although this part of the coast may have as much as two months without any precipitation, it is usual for heavy but sporadic rains to fall throughout the year. Moving from Puerto Cabello to the east, toward the central coast, the conditions become more arid.

Higher, on the slopes of the Cordillera de la Costa, the rains are much more abundant and there are no months without rain (Vila 1968: 7). As a direct result of these sharp differences in relative humidity, the vegetation on the low littoral strip is composed of xeric species, but at the altitude of 800-1000 meters the magnificent cloudy forest begins.

Chapter Two

History of archaeological research

The Valencia Basin area has attracted the interest of antiquarians, scholars and looters since at least the mid 19^{th} century. Different factors have been mentioned as prime movers of this rise of interest. The attraction seems to have stemmed from the unique physiographic-ecological configuration of the region and the long span of its cultural history. The lake shores were (and in a few sectors still are) 'sprinkled' with the remains of ancient habitation, including artificial mounds, stone walls, burials in large urns accompanied by rich paraphernalia and artefacts made out of clay, stone, bone and shell. Another obvious advantage for early explorers stemmed from the geographical position of the Valencia Basin: close to the important maritime port of Puerto Cabello and easily accessible by road from the capital city of Caracas (the approximate Caracas-Maracay distance of 109 kilometres [Figure 1]).

However, the main natural factor that permitted the rise of the interest in Valencia Lake antiquities after the mid 19^{th} century has been overlooked. According to the studies of water level fluctuations (see the map in Schubert 1978), it was not until the 1850s that the water level of the lake dropped enough to uncover the most important archaeological sites located on the eastern shores.

Collecting, admiring and speculating: 1887-1930

The first contribution to the archaeology and ethnohistory of the Valleys of Aragua and Caracas was written by Gaspar Marcano (1850-1910). Marcano, a member of La Société des Américanistes and trained in France as a doctor of medicine, can be considered the first Venezuelan anthropologist and ethnohistorian (Marchelli 1971; Margolies and Suárez 1978). Taking advantage of the visit to Paris by Guzmán Blanco, the future President of Venezuela, Gaspar Marcano aroused his interest in the prehispanic past of the country. Once Guzmán Blanco became a president he created the Anthropological Commission with Vincente Marcano, Gaspar's brother, in charge (Marchelli 1971). In 1887, at the site of La Mata (5 km west from the eastern lake shoreline), Vicente Marcano completely excavated 20 out of more than 50 mounds or *cerritos* (Marcano 1971[1889-91]: 40 [Figure 3]). Gaspar Marcano analysed the information he received from his brother and studied the collection of 507 artefacts shipped to him to Paris (Pérez Vila 1988, vol. 2: 822). Additionally, he studied and interpreted the early Spanish chronicles concerned the region.

Although from a contemporary perspective Vicente Marcano employed a rather coarse grained method of excavation, such aspects as the recovery of faunal remains as well as his brother's search for the professional advice to identify them, constituted the first attempt of its kind in Venezuelan archaeology, and were not surpassed during the next half century. The results of the research were published between 1889 and 1891 in Paris (Marcano 1971[1889-1891]), and a selection of Amerindian artefacts excavated in La Mata was exhibited at the Universal Exposition in 1889. Finally, the whole collection (including human skeletal remains) was deposited in the Musée de l'Homme in Paris (Marchelli 1971).

At about the same time, Adolph Ernst (1832-1899), the German naturalist and founder (in 1874) of the Museum of Natural Sciences in Caracas, also increased the interest in the pre-Hispanic antiquities both in Venezuela and abroad. In 1886 Ernst planned to excavate in 'some Carib burials at Santa Cruz', approximately in the area formerly excavated by Vincente Marcano. The excavations were to be carried out on behalf of the Bureau of Ethnology, Washington, whilst the Secretary of the American Embassy in Caracas was to accompany him during fieldwork (Ernst 1886). Even though these plans were not carried-out, Ernst contributed with descriptions and illustrations of collections from the Valencia region deposited in the Museum of Natural Sciences in Caracas (Bruni Celli 1968).

Alfred Jahn (1867-1940), a 'disciple' of Adolph Ernst, was one of the members of Anthropological Commission created by Guzmán Blanco. Afterwards, he had participated as an engineer in the earthworks related to the construction of the Caracas-Valencia railway and gained exceptional first-hand knowledge of the area. In 1903, he returned to the eastern shore of Lake Valencia and carried out excavations on behalf of the Museum für Völkerkunde of Berlin (von den Steinen 1904; Jahn 1927). He excavated at two mound complexes: La Mata (also called El Zamuro) and 6 kilometres to the north, in the Camburito site (Jahn 1927). The report of Jahn's explorations carried out in 1903 was partially published in German by Karl von den Steinen (1904). Jahn interpreted the mounds as habitation sites and recovered 32 skulls, 140 lithic artefacts, 150 ceramic artefacts, 38 beads and amulets of bone, shell and stone. All these artefacts were shipped to the Museum für Völkerkunde in Berlin.

All these discoveries stimulated an international interest in Venezuelan archaeology. In 1915 Herbert J. Spinden from the American Museum of Natural History, New York, conducted an archaeological reconnaissance of Venezuela starting from Maracaibo Lake (to the west) to Ciudad Bolívar (to the east [Spinden 1916]). This interest in Venezuelan prehistory was neither exceptional nor isolated from the broader archaeological perspective of northern South America. By this time, other pioneering contributions to the archaeology of Venezuela and the neighbouring countries were published. Toward the Venezuelan eastern coast, De Booy (1916) surveyed and excavated Amerindian sites on Margarita Island. Fewkes (1914) excavated at an Amerindian shell-heap at Erin Bay at Trinidad. Both researches were carried out under the auspices of the Museum of the American Indian, Heye Foundation. Farther to the east and about three decades earlier, the shell mounds of British Guyana had been described and brilliantly interpreted by Im Thurn (1967[1883]). To the south, the archaeological sites of Marriage Island, at the mouth of Amazon, had been described and interpreted a few years earlier (Derby 1879; see Roosevelt 1980 for the review of the research history in this area). To the west, several contributions to Colombian archaeology had been known since mid 19th century (see Reichel-Dolmatoff 1986), and between 1913-1914 the expedition of Konrad T. Preuss on behalf of the Museum für Völkerkunde in Berlin, systematically explored for the first time the site of San Agustín (Preuss 1929). In early 20th century, the Dutch priest A. Van Koolwijk collected archaeological material on Aruba, Curaçao and Bonaire, the Dutch islands located off the western Venezuelan coast (Van Koolwijk 1881; 1882; Leemans 1904; for the description of Van Koolwijk's finds see De Josselin de Jong 1918; 1923).

Taking into account this scenario of geographically isolated but stylistically related cultural remains, the main goal of Spinden's survey was to examine the role of Venezuela in the resolution of current general problems, in particular (1) the dispersion of the Amerindian populations from the north-western part of South American continent into the West Indies and (2) the possible cultural connection between Colombia and Costa Rica to the west and eastern Brazil to the east. From Spinden's attempt to correlate the archaeological evidence between these areas stemmed the statement about the 'intermediate role or position' of Venezuela in the archaeology of northern South America. This assertion was interpreted and reinterpreted by different scholars, and remained the general research orientation of Venezuelan archaeology for the next few decades.

Regarding Valencia Basin, Spinden confirmed the archaeological richness of this area and considered it a result of a local development over a long period of time. He also lamented 'that the most remarkable group of mounds is now being destroyed in a hasty and unguided search for specimens' (Spinden 1916: 326).

Despite the valuable information gained, the interest of the foreign scholars and institutions had also a negative impact on Valencia archaeology: it accelerated the exodus of archaeological artefacts out of Venezuela. The prehistoric mound complexes of the eastern shore of the lake were particularly affected. About 1917 Pedro José Rodríguez collected there a great number of artefacts which were sent to the American Museum of Natural History. A few years later Luis G. Martínez collected more material destined for the same museum; however, according to Kidder (1944: 22), the latter collection was finally divided between the American Museum of Natural History and the Museum of the American Indian, Heye Foundation.

Between 1910 and 1940, Luis R. Oramas (1882-1966) an engineer, naturalist and linguist, explored the Valleys of Aragua and Caracas, and the Central Coast (Oramas 1917; 1940). His explorations resulted in a vast collection of more than 3000 Amerindian artefacts (Pérez Vila 1988, vol.2: 1152). During the excavations that were performed in 1914 in the area of mounds on the eastern shore of Lake Valencia, Oramas recovered 200 lithic, 350 ceramic artefacts, collars made out of marine shells (*Strombus gigas*) and human bones (Oramas 1917). At a depth of 50 cm near the centre of the mounds he found burial urns and stated that the black soil that constituted the mounds was not natural to the site but was brought by Amerindians from distant areas (Oramas 1917).

Oramas was the first scholar to recognise the striking morphological similarities between the archaeological remains from Lake Valencia and those distributed to the east, in the Valley of Caracas, and further to the north on the central coast. Like other scholars of his time he searched for an ethnohistorical explanation for this stylistic uniformity.

Towards the 1930s the archaeological remains of the region were quite well known by the foreign scholars interested in South America (Uhle 1925; Krickeber 1946[1922]; Lovén 1935[1924]). However, the interpretations were almost entirely framed in terms of diffusionary theories. Uhle (1925) considered the Valencia Lake prehispanic cultures were degenerate forms of Amerindian cultures which originated in Costa Rica, and Krickeber (1946[1922]) conceived them as the easternmost vestiges of cultures of eastern Colombia. As illustrated by these examples, the potential of Venezuela to resolve some problems of diffusion in American archaeology, as specified by Spinden few years before, were still very attractive.

By that time two new circumstances contributed to the reinforcement of interest in Valencia archaeology inside and outside Venezuela. The internal factor was the harmonious rapport established between the intellectual Rafael Requena (1879-1946) and the Dictator Juan Vicente Gómez, a relationship which that resembles that which existed previously between Gaspar Marcano and President Guzmán Blanco. Requena, as President of the State of Aragua (1929-1931) and a Private Secretary of Gómez between 1931 and 1933 (Pérez Vila 1988, vol.3: 374), was encouraging the interest of the Government in the prehispanic past of the country.

The external factor was associated with the changes in North American archaeology closely linked to the general orientation toward Latin America adopted by the government of President

Franklin D. Roosevelt [(1933-1945) Gassón and Wagner 1994]. Parallel to the economic and political interest, North American archaeology extended its interest in Latin America with the creation of several long-term projects. In particular, one of these projects, *The Caribbean Archaeological Program* created in 1933 at Yale University, would have long term effects on the development and objectives of Venezuelan archaeology (Gassón and Wagner 1994).

Rafael Requena was undoubtedly the dominant figure of the archaeological scene in the early 1930s. According to his diary, which incorporates his own observations complemented by those of his fieldwork supervisor, the Uruguayan Mario del Castillo, and his son Antonio Requena, the excavations were carried out during 28 days in September and October 1930 (Requena 1932). The mound complexes located on the eastern shore of the lake were extensively excavated: Los Cerritos, Tocorón and La Mata. Excavations also took place at Los Tamarindos (Peninsula of La Cabrera) and at the site of El Cascabel, on the west flank of the lake. As can be discerned from Requena's diary, the main emphasis in these excavations was on the recovery of burials, since burial contexts, as Requena's predecessors had demonstrated, guaranteed the recovery of complete and aesthetically valuable objects. The methodology employed during fieldwork was below the standards accepted by the professional archaeology of those days and a large quantity of shards and lithic artefacts were left scattered around the trenches (Kidder 1944: 28). During these 'diggings' 221 burials were excavated (Requena 1932: 260). The majority of the objects recovered were soon exhibited in the Museum of Prehistory, in Maracay. After President Gómez's death, only part of Requena's collection passed to the Museum of Natural Sciences in Caracas (Peñalver 1965: 6).

Requena's excavations added few new data regarding the composition and function of the mounds. He found many stakes (interpreted as probable remains of the dwellings on stilts), hearths composed of three stones, a great deal of ash, pottery, animal bones and shells. He concluded that the mounds were used not only as burial grounds, but also as habitation sites (Requena 1932: 249). Requena also noted a morphological difference in pottery and other artefacts recovered in the first layer (to an average depth of 2 meters) and the deeper strata. He interpreted these differences as the material expression of two Amerindian 'races' that inhabited the mounds (Requena 1932: 294). However, the precise information about the criteria employed for the discrimination of such differences cannot be found in Requena's report.

Unfortunately, Requena's publications were dominated by speculation about the origin of his discoveries. He had been insistently comparing his finds with objects of ancient cultures of India, Egypt, Mexico, and Italy, among others. This was done in an attempt to 'elevate' the intrinsic value of his findings by proving the Atlantis origin of the Valencia Basin inhabitants (Requena 1932). To reinforce his hypothesis, Requena apparently utilized a few 'hybrid artefacts' he restored, with no attention paid to the stylistic standards of the Valencia pottery. The newly made clay bases were stuck to the heads or torsos of the original figurines and were then related to the statuettes from ancient India and Egypt (see Requena 1932: 71; Antczak and Antczak n.d.); a few of these 'hybrid artefacts' can still be seen in the Museum of Natural Science in Caracas.

Comments

The first period of archaeological work in Valencia Basin was characterized by unsystematic explorations and excavations (Gassón and Wagner 1994: 126). Fieldwork emphasis was placed on the recovery of preferably entire, aesthetically valuable artefacts, so that burial grounds were explored for preference. The faunal remains were almost completely neglected. Regarding the archaeological context and spatial associations of the artefacts, only a coarse- grained distinction between the burial and habitational sites was proposed. However, the criteria used to reach such conclusions were rarely specified.

In the interpretations, the threshold between the archaeological evidence and ethnohistorical narration was trespassed freely and without methodological rigour. Submerged in the overwhelming trend of diffusionism, many scholars were engaged in synchronical and supraregional formal comparisons of their findings, while others were absorbed in speculating about the origins. The absence of adequate methodological devices prevented the construction of reliable chronological sequences.

The figure of Rafael Requena closes metaphorically the first, and opens the second, period in Valencia Basin archaeological research. Requena was the first among the past-oriented Venezuelan intellectuals cognisant of the limitations of the efforts of his predecessors and of himself. Having an unlimited access to the international archaeological forum (meetings, literature, etc.) he knew that only controlled excavations and interdisciplinary research could push Valencia archaeology beyond the border of knowledge so far accomplished. In an initial attempt at seeking for the professional advice Requena invited the already mentioned engineer Alfred Jahn to study the fluctuations in the level of the lake, specially at the sites of La Cabrera and Araguata, and to correlate them with the archaeological record (Jahn 1940; Cruxent and Rouse 1958: 302). Subsequently, Requena searched abroad for additional professional support.

The archaeological boom: 1930-1958

Such results of Requena's excavations as the spectacular exhibition and profusely illustrated book positively impressed the governors, and created a propitious political atmosphere to invite to Venezuela foreign scholars and to offer them all facilities needed to excavate in the Valleys of Aragua.

As a result of Requena's patronage the years 1932/1933 constituted a real scientific 'traffic jam' in the Aragua Valleys. This archaeological boom had a stimulating effect on Venezuelan archaeology. During these years, a number of archaeological surveys were performed and reports of discoveries from different parts of Venezuela were published (Nectario María 1933; 1942; Nomland 1933; 1935; Linné 1937; Vellard 1938; Petrullo 1939; Oramas 1940).

The first foreign archaeologist who appeared in the scenario of the Valleys of Aragua was Wendell C. Bennett, affiliated with the American Museum of Natural History. In September-October 1932 Bennett excavated one of La Mata mounds located on the old lake bed (Bennett 1937). In the mound he recovered 57 primary and urned burials and suggested that the mound served as an important burial ground (Bennett 1937). However, it was also a habitation site; 25 post holes with several partially preserved stakes and one cross beam was also located. Bennett suggested that the earliest inhabitants of the site were the lacustrine dwellers identified in the basal sections of his excavation. Afterwards (probably during the regression of the lake water level), people began to live on the top of the mound that originated mainly with the debris fallen down from the pallafitte dwelling. Bennett also contributed with the typology of clay human figurines and the description of the stratigraphic sequences of pottery and human burials (Bennett 1937).

In 1933, Alfred Kidder, one of the practitioners of the stratigraphic revolution in North American archaeology (Willey and Sabloff 1974: 139) surveyed various sites in the Valley of Aragua, and performed six weeks of excavations at La Peninsula de La Cabrera (Kidder 1944: 3 [Figure 3]). Under the direction of Division of Anthropology of Harvard University and with financial support of a Rockefeller Grant for Research, Kidder returned to the region in 1934. Initially, he excavated an extensive site in San Mateo (23 kilometres east of the city of Maracay). In general terms, this site was interpreted as another of 'the numerous sites which point to a large aboriginal population in the Aragua Valley' (Kidder 1944: 86). After the San Mateo excavation, Kidder returned to the Península de La Cabrera, where he carried out his renowned fieldwork at the site of Los Tamarindos.

The main contribution of Kidder's excavations at La Cabrera, supported by the cultural and geological stratigraphy of the site, was in the seriation of artefacts into a cultural sequence. Kidder excavated at the same locus where Requena had excavated in 1932; however, using a step system of excavation, he was able to reach to a depth of four meters and to control the stratigraphy. In these excavations Kidder had a unique opportunity to identify two overlapping archaeological deposits: the earlier (La Cabrera) component stylistically related to the Barrancoid ceramic tradition associated with the area of Lower Orinoco, and the posterior, named Valencia, presumably locally developed Valencioid component (Kidder 1944). He distinguished and described the main features of each phase, discussing the ceramic, lithic, bone and shell artefacts as well as human burials.

Regarding pottery assemblage, Kidder recognised striking stylistic differences between the two phases. No Valencia Red ware (the main type of the Valencia Phase) was found below the second meter of excavation; below this, in the deeper levels, only La Cabrera ware was present. In burials, the differences were also evident: the La Cabrera Phase stratum contained simple burials while the

Valencia layer included mainly urn burials. Clay human figurines were absent for the La Cabrera Phase and common in the subsequent Valencia Phase. La Cabrera mortuary offerings were composed mainly of beads with rare pottery artefacts, while during the Valencia Phase pottery offerings were abundant (Kidder 1944: 81).

In contrast to Requena and Bennett, Kidder did not find any postholes nor other house remains at the Los Tamarindos site. This negative evidence needed explanation because the location of the earlier deposits in relation to the past shorelines clearly indicated that the people lived very close to the water, or even over it, during periods of high water level in the lake. Kidder hypothesised that: (1) the remains of stilt dwellings would have to be sought in the deepest strata that had never been reached in his excavations, or (2) that there were preservation problems (Kidder 1944). Kidder did not find any sterile stratum separating La Cabrera and Valencia ceramics in the soil matrix, even though they were stylistically clearly different assemblages. This lack of the evidence of the transitional stages between Cabrera and Valencia ceramics Kidder explained by gradual local evolution or the consequence of invasions (Kidder 1944). Kidder's research at Los Tamarindos added, for the first time, a chronological dimension to the archaeological panorama of the region.

Also in 1933, Edward W. Berry, Professor of Palaeontology at John Hopkins University, visited the Valencia Lake area to perform 'a study of the geology and palaeontology of the deposits which were yielding such a quantity of archaeological and anthropological objects' (Berry 1939: 547). His goal was to determine the age of human remains on the lake shores (Berry 1939: 556). He supervised the excavation of two test pits near Kidder's main trench, as well as starting another trench, all this to check the stratigraphy of Kidder's main cut (Kidder 1944: 30). Berry also visited a few sites along the lake shore and islands, and took notes on stratigraphy of 8 sections and 10 sections of test pits (Berry 1939). According to Kidder (1944: 35) one of Berry's pits reached the depth of 5 meters, without reaching a culturally sterile stratum. Berry emphasised that his excavation was systematically controlled only to a depth of 3 meters (Berry 1939: 547, 556). From Kidder (1944: 46) we also know that Berry excavated an interesting burial context in the West Trench, but there is no mention of it in Berry's paper. The burial consisted of a group of 'four adults and four children, disposed secondarily under a very large urn, which was, however right side up as it lay over them' (Kidder 1944: 46).

Kidder disagreed with Berry regarding the relative chronology of the Valencia Phase assemblage. Taking into account the presence of bones of domestic dog (*Canis familiaris*) and cattle (*Bos taurus*) in upper levels at Los Tamarindos (in the humus beds close to the surface) Berry concluded that the bearers of the urn burials (he identified them with the Carib-speaking people) lived at the site in early Indo-Hispanic period (Berry 1939: 558). Kidder agreed that the urn burials were late phenomenon in the area but rejected the hypothesis of their post-Conquest dating. The domestic dog, he argued, was autochthonous in South America and not introduced by Spaniards; additionally, the presence of the cattle bones was restricted to the superficial level and was never associated with undisturbed aboriginal burials or rubbish (Kidder 1944: 36).

To summarise Berry's contributions, he identified five erosional terraces on the lake shores and correlated them with both the variations in the lake water level and the distribution of the prehistoric settlements. He also described faunal remains recovered in Kidder's and Osgood's excavations, which had been identified by a group of specialists (Berry 1939: 547-8; see also Wetmore 1935).

During the same year of 1933, Cornelius Osgood of the Peabody Museum of Yale University performed excavations at the eastern shores of Lake Valencia. This research initiated *The Caribbean Archaeological Program* of the Peabody Museum that, as we have already stated, had a long term influence on Venezuelan archaeology.

For his excavation Osgood selected a mound at Tocorón, to the south of the La Mata mound complex. Unlike Requena and Bennett, he did not locate any remains of stilt dwellings. Interpreting the excavated mound, Osgood argued that the first occupants of the site lived directly on the old lake bed. He further indicated that the mound originated around a burial of a monkey or an infant, and that once the construction of the mound was concluded it functioned as a habitation site. Osgood also reviewed the published data regarding the characteristics of the mounds on the shores and concluded that they were constructed for many reasons and served different purposes (Osgood 1943). In addition to his excavation in Tocorón, Osgood spent a short time excavating at the El Charral site, on the lake's western shore.

In 1941-42 Osgood returned to Venezuela together with George D. Howard and carried out an extensive archaeological survey of the country, covering a great part of the northern area, stretching from the Orinoco River to the east to the Colombian border to the west (Osgood and Howard 1943). Osgood and Howard, using the Mid-western Taxonomic Method (McKern 1939) classified all surveyed sites into six phases defined in terms of cultural traits that included mainly, but not exclusively, pottery. It is noteworthy that the similarity between two or more of these classificatory units was purely formal and did not imply any chronological relationship between them. Like the Midwestern prehistorians, Osgood and Howard did not make a distinction between a people and its culture (see also Rouse 1972). They did not perform any excavations in the Valencia Basin, but reviewed the available data regarding the archaeology of that region and outlined the stylistic relations between the Basin's pottery and those from other surveyed areas.

The La Mata mound complex was considered by Osgood and Howard as a typical site of the Valencia Phase (so called La Mata Aspect) which they perceived as:

> The most typical of all [Venezuelan phases]...[since] it embraces one of the most distinctive aggregates of cultural material within the country and we know of no complex like it outside (Osgood and Howard 1943: 145).

Osgood and Howard's survey stimulated archaeological research in Venezuela for at least two following decades.

Like others before him, José María Cruxent, the 'father' of Venezuelan archaeology, initiated his archaeological research in Valencia Basin sites. In 1942-43, he excavated at Camburito on the eastern shore of the lake, where he recovered four urn burials (Cruxent 1946a). Other burial vessel and petroglyphs were located by Cruxent at the ravine (*quebrada*) of Maletero, to the north-east of the town of La Victoria (Cruxent 1945a).

In 1946, Cruxent and the members of the Commission of Archaeology of the Natural Sciences Society of La Salle in Caracas undertook a rescue excavation in Tocorón, in the area where earthworks for a construction had been started (Cruxent et al. 1946). Two sections of 5 m² each in two different mounds in two levels of 25 centimetres were excavated. The collection was made up of 654 artefacts, with a tendency to be more abundant in the first 25 centimetres (Cruxent et al. 1946). The stratigraphy of the excavations was very similar to that observed by Osgood. Cruxent did not recover any bone artefacts but mentioned the presence of scarce mammal bone remains (Cruxent et al. 1946: 36).

Later, in 1947, Cruxent studied the human skull found fortuitously between two ceramic vessels on the right bank of the Vigirimita River, and classified it as La Cabrera Barrancoid style (Cruxent 1948). He also described a prehistoric stone wall near Vigirima and the neighbouring spectacular complex of petroglyphs at Cerro Pintado (Cruxent 1952). In 1955 Cruxent studied a few preceramic lithic remains located in the city of Valencia that were grouped into the Michelena Complex (Cruxent and Rouse 1958).

Cruxent did not carry out any extensive and systematic excavations in the Valencia Basin, partly because he considered, like Osgood and Howard (1943: 49-50; 65-61), that 'in this area were performed so many former investigations'. He stated clearly that his main goal was to amplify and deepen the work carried out by Osgood and Howard and to cover precisely these areas that were poorly studied by them (Cruxent and Rouse 1958: 14).

Beginning in 1946, Cruxent started a long term and fruitful co-operation with Irving Rouse from Yale University. Rouse developed his research with Cruxent as a part of his investigations for the previously mentioned *Caribbean Archaeology Program* established in Yale in 1933 (Cruxent and Rouse 1958: 17). At that moment, Rouse already had an enormous professional experience with the archaeology of the West Indies. Additionally, having Cornelius Osgood (at this time the director of *The Caribbean Archaeology Program* of Yale) and Wendell Bennett as his colleagues at the Yale University (Cruxent and Rouse 1958: 302), Rouse was particularly 'well equipped' to carry on the archaeological research in Venezuela. This co-operation between Cruxent and Rouse resulted in 1958 in the publication of the monograph *An Archaeological Chronology of Venezuela* which the authors called 'the direct consequence of Osgood and Howard's works' (Cruxent and Rouse 1958, vol.1: 14).

The monograph achieved two very important goals. Firstly, it summarised the present state of the Venezuelan archaeology (updating Osgood and Howard's work). The second achievement was the detailed and country-wide archaeological chronology of Venezuela (Cruxent and Rouse 1958). In comparison with the first space/time perspective of Venezuelan archaeology which had been outlined by Kidder in 1948 for the *Handbook of South American Indians* (Kidder 1948: 432-3), the chronology of Cruxent and Rouse was not only 'wider and deeper' but also included the first radiocarbon dating (Cruxent and Rouse 1958, vol.1: 15).

The elements used for the elaboration of chronologies and studies of the spatial distribution of cultural traits were chosen mostly from the ceramic assemblages. The non-ceramic remains were outside the immediate interest of Cruxent and Rouse and their recovery and analyses were explicitly left to their followers (Cruxent and Rouse 1958, vol.1: 23-24).

Comments

The second period of Valencia Basin archaeology started with a real professional 'boom'. Important standards of North American archaeology of that time, such as the stratigraphically controlled excavations, the use of seriation of the ceramic artefacts for establishing the chronologies of prehistoric cultures, and attempts at interdisciplinary efforts in the identification and classification of archaeological specimens reached the Valencia Basin through the triumvirate of archaeologists: Bennett, Kidder and Osgood. As a result of their research the formal attributes and chronological sequence of the Valencia Basin pottery, and correlation between the geological and archaeological evidence, had been established.

The notion of certain social, political and economical mechanisms that operated during late prehistory in the Valencia Basin and the surrounding areas can be traced back to Marcano's work in the late 19th century (Marcano 1971[1889-1891]). Thorough the following decades that notion was slowly taking shape until Bennet's, Kidder's, Osgood's and Osgood and Howard's research. However, it was Cruxent and Rouse in 1950s who set down the wide geographical and chronological framework for the Valencioid and Barrancoid series (Kidder's Valencia and La Cabrera phases respectively). New localities with pottery stylistically related to the Valencia and La Cabrera series were located by Cruxent in the neighbouring Valley of Caracas and along the coast from Tucacas to the West to Río Chico to the east (Cruxent and Rouse 1958; Rouse and Cruxent 1963). On the basis of the material recovered in these sites a number of style*s* pertaining to the Barrancoid and Valencioid series were formulated. Additionally, new ceramic components were located in the area and placed in the relative and absolute chronological charts.

At the same time, quite solid bases for the formulation and simulation of different models of interaction between the cultural components of the region were set down. The response to the consecutive questions: *why*? and, *how*? would have been searched for.

More artefact-oriented studies: 1958 to the present

At the beginning of the 1960s only few small scale excavations were carried out on shores of Lake Valencia. In 1961 Mario Sanoja with the students from the Central University in Caracas excavated at Los Cerritos, one of the important archaeological sites of the western shore of the lake. A few funerary urns were excavated but no detailed report of these excavations is available (Peñalver n.d.b: 9).

By the same year, the Museum of Natural Sciences in Caracas sent Helmut Fuchs to undertake salvation archaeology at La Pica (to the east of the lake and north of the La Mata mounds complex). Fuchs dug out three urns with offerings in the street of the village (Fuchs 1963; Peñalver 1967: 6). He was also given a number of artefacts collected by the authorities during the construction of an urbanisation at the site.

In the mid 1960s, the destiny of Valencia Basin archaeology was determined for the next decades. In the cities of Maracay and Valencia regional Institutes of Anthropology and History were created and, in the following years, the museums of local history were also established. Under the direction of Henriqueta Peñalver, these institutions were, and still are, responsible for all of the official excavations performed in the most important archaeological sites of the area. Only a few short reports of these excavations have been published thus far (Peñalver 1965; 1967; 1971; 1976; 1981; n.d. a, b, c).

According to Peñalver (1981), the stratigraphy and general characteristics of the Los Cerritos site, in the mound complex on the western shore, resemble the complexes from the eastern shore, such as La Pica and La Mata. The Los Cerritos mounds had a clear funerary function, containing ceramic burial vessels (urns) up to 1.2 meters in height and up to 0.8 meters in diameter. In Los Cerritos, Peñalver excavated a total of 380 urns and 287 direct burials. One exceptional piece of evidence recovered at this site are the urn burials of monkeys accompanied by offerings, just as the human burials were. One of the human bones uncovered at Los Cerritos at the depth of 80 cm was assayed by Geochron Laboratories Inc., Cambridge, Massachusetts and gave the date of 1025±115 b.p. (Peñalver 1969: 51).

Close to Los Cerritos, on the southern bank of the El Roble River, another complex of funerary mounds was located. There Peñalver excavated ceramic funerary urns containing both primary and secondary burials (Peñalver n.d.b). Additionally, one probable habitation site was located very close to the river, outside of the mound complex boundary.

On the eastern shore, Peñalver excavated at the renowned La Pica and Las Matas mound sites. At La Pica a total number of 151 burials in ceramic urns and 23 direct burials were excavated and, according to Peñalver, the mounds were dominated by funerary assemblages (Peñalver 1967).

The Las Matas (or El Zamuro) site had been partially excavated by Jahn, Requena, Bennett and others. At this site, Peñalver (1981) started excavations in the nine remaining mounds and reported the recovery of hundreds of figurines, great quantities of pottery and lithic artefacts. The excavations continued until reaching the old lake bed where a few post holes of the lake dwellers' huts were found.

The Río Blanco site, situated on the northern lake shore was an extensive burial area located along the sandy beaches of the river of the same name. There Peñalver extracted some 17 urns with a total of 23 skulls; the burial offerings included clay figurines, beads, engraved deer bones and a small number of ceramic vessels (Peñalver 1967).

In 1968 Peñalver (n.d. c) started excavations at El Morro de Guacara, probably an ancient island, but nowadays a peninsula connected to the land. At this site, at the depth of 40 cm, the skeleton of a person with a collar made with *Oliva* sp. shells around his neck, associated with engraved stone pendants was found. A sample of these human bones gave a radiocarbon date of 4400 b.p. (Peñalver n.d. c). The *Megatherium* remains recovered very close to the human bones were dated to 10,200 b.p. (Peñalver n.d. c: 13); however, details about the spatial and contextual relationships between these human and animal remains have not been provided by Peñalver.

Peñalver also excavated such coastal sites as San Gean, La Iguana, Ocumare, and Cumboto, located north-west of the Valencia Basin. However, the reports included very scarce description of the artefacts and their context impeding any comparative analysis to other sites in the region (Peñalver n.d. b, c).

Regarding the sequence of Valencia Basin prehistory, Peñalver rejects the cultural chronology of the region proposed by Bennett, Osgood, Kidder, and Cruxent and Rouse. In earlier reports (Peñalver 1965; 1967; n.d. a), she mentioned the existence of two Amerindian populations settled in the Valencia Basin, defined on the basis of different funerary practices. The direct burials were associated with the earlier lake dwellers, and the urn burials with the later lake dwellers. No other artefactual differences (including pottery) between these two cultural components, were discussed by Peñalver until the 1970s.

In a short communication in 1971 Peñalver proposed that there were three distinct waves of prehistoric settlers into Valencia Basin. The first were the bearers of the 'black colour' ceramics dated about 4400 b.p. These settlers were associated with the already mentioned radiocarbon date from El Morro de Guacara and can be roughly related to Cruxent's Michelena Complex (Cruxent and Rouse 1958). However, the Michelena Complex is considered a preceramic assemblage and no ceramic presence in north central Venezuela has been reported until the time of the Christ. According to Peñalver (1971) the second settlers, users of modelled ceramics, arrived 'around' a.d. 361. This date cannot be matched with any published radiocarbon date, but this event can be correlated roughly with the arrival of Barrancoid peoples in the Valencia Basin, whose ceramics correspond to Kidder's (1944) La Cabrera Phase and Cruxent's and Rouse (1958) La Cabrera style. Finally, the third cultural event seems to refer to the arrival of new groups from the west, a few centuries before the European Conquest. This event can grossly be correlated with the rise of the Valencia Phase (Kidder 1944) or style (Cruxent and Rouse 1958).

In the 1970s, a few archaeologists attempted to reach beyond mere artefactual descriptions of Valencia Basin archaeology and to make explicitly the prehispanic economy and social formations the domain of their research (Sanoja and Vargas 1974; Molina 1985; Toledo and Molina 1987; Vargas 1990). Appealing to a historic materialist paradigm, Sanoja and Vargas presented a lineal sequence of the increase in social complexity of the societies settled on the lake shores. This sequence goes from egalitarian society to chiefdom (Sanoja and Vargas 1974) and according to Vargas (1990), the ecological factor was responsible for this increase in socio-economic complexity. Vargas (1990: 237) argued that the Valencia Basin being 'the ecological zone of the best confluence [of natural resources]' had stimulated the highly productive economy of the prehispanic inhabitants. This economy was based on gathering, hunting, lacustrine fishing and, above all, the intense agriculture. The stability of the Amerindian villages and population growth were the direct consequences of the economic efficiency that was achieved around the Lake Valencia shores. Once the chiefdom organisation was established and strengthened it commenced to expand its territory as well as its area of influence. Seeking to complement the resources that were available within the Valencia Basin by gaining access to those of different ecological zones beyond this core area, the chiefdom expanded both directly (colonisation of the coast and islands) and indirectly (subjugation of the egalitarian peripheral societies [Sanoja and Vargas 1974; Vargas 1990]). This expansionist development of the chiefdom is responsible, according to the Sanoja and Vargas analyses, for the presence of pottery stylistically related to the Valencia series, beyond the Valencia Basin.

In 1979 the Central University of Caracas started a long term project on the Caribbean coast to the north-east of the Valencia Basin directed by Fulvia Nieves and Carlos A. Martín (Wagner and Durán 1983). The coastal bays between Choroní and Cepe were explored and in Chuao and Puerto Maya bays small scale excavations were performed (Morales 1984; Alvarez and Casella 1983; Martín 1995). In parallel, on the central-eastern coast Fulvia Nieves started archaeological and ethnohistorical investigations concentrated around Píritu and Cúpira villages (Nieves 1979; 1983; 1992). At the same time, the Venezuelan Society of Speleology carried out an archaeological survey on the rock shelters located on the central coast (Perera and Martín 1982). All these researches added new information referred to the spatial distribution of the pottery styles of the Valencia series.

Finally, in 1982 was initiated the project on *Venezuelan Islands Archaeology* whose results will be discussed in this dissertation.

Comments

Since the 1960s, despite the fact that the excavations performed in the Valencia Basin and the adjacent coast were usually carried out in very extensive trenches, the published reports give us only a very coarsely grained information: the archaeofaunal, environmental and contextual data are extremely scarce. The emphasis of these works was put on the recovery of artefacts, and the main emphasis was on the aesthetic value of the finds, their number and physical integrity.

The search for replies of the questions of *who*?, *where*? and *when*?, that were already answered during the former period, have still been the leading motive for undertaking the excavations. The persistence of this orientation can be easily understood in less excavated or even unsurveyed regions of Venezuela. However, in the Valencia Basin it meant lost opportunities to formulate and reply to another set of questions, such as *why*? and *how*?, or in other words to shift the emphasis of the research questions from prehistoric <u>cultures</u> to <u>societies</u>.

During the 'post-Cruxent' period, Valencia Basin archaeology has lost the leading position, that had held, for more than half a century, in the archaeology of Venezuela.

Chapter Three

A critical review of the regional cultural sequence

This chapter will provide a review and critique of the prehistoric cultural sequence of Valencia Basin archaeology with emphasis on the interpretation of non-ceramic evidence. Regarding pottery, no significant improvements in its regional chronology and stylistic analyses have been accomplished during the last 35 years. As a result, I will retain the terms such as complex, style and series that were introduced by Cruxent and Rouse in 1958 (see also Rouse and Cruxent 1963).

The 'post-Cruxent' period (from 1960s onwards) has been adequately denominated by Wagner as a 'pre-New Archaeology' stage of Venezuelan archaeology (Wagner 1978). Regarding the Valencia Basin, this stage has still been characterized by the application of 'artefact-based' methodology that consists of the 'reliance on artefacts from sites without controlling for the contexts in which they are found' (see Stanish 1992: 29). Additionally, it should be stressed that almost all excavations, subsequent analyses and interpretations undertaken in the Valencia Basin were focused on prehistoric cultures defined by artefact (mainly pottery) styles. The researches were oriented to determine the origins or initial spatial/temporal occurrence of certain artefacts and/or traits, as well as the spread of new traits or peoples. These studies were not concerned with societies, their settlement patterns, household determination, subsistence or political economy, ideology and the resolution of their different organisational levels. The limited kind of data for artefact-oriented studies (Stanish 1992) strongly constrains any current attempt to construct high level theories, including adaptationalism, evolutionary ecology and structural Marxism (Preucel and Hodder 1996: 9).

It should be underlined that Cruxent and Rouse (1958) did not ignore the non-ceramic evidence, but they recognised that it was very scarce. While establishing the chronological charts they took into account both ceramic and non-ceramic data ('associated artefacts'). They clearly stated that the scarcity of non-ceramic material forced them to use the concept of *style* instead of *phase* (as it was used by Kidder [1944] for example).

Since the main goal of the present study is to define the economic patterns of Amerindian insular societies, and to compare them to their culturally related counterparts from the mainland, it is necessary to 'translate' the archaeological cultures into the living assemblages of peoples and societies.

Rouse defined *people* (culturally homogeneous local population) in terms of their cultural artefactual assemblages that are stylistically homogeneous (Rouse 1972; 1986). The local population can be divided into social units called *societies* that can be inferred from the nature and distribution of people's assemblages (Rouse 1986: 4). The Valencioid pottery styles were created and used by peoples who may be divided into societies, that were each responsible for their local style. Variations within a style may be partly indicative of difference at the level of society.

I will introduce here the concept of 'sphere of interaction'. In Venezuelan archaeology, this concept has been used as an alternative to the models of prehistoric migration and diffusion. Arvelo and Wagner (1984) proposed and used the model of *Sphere of Interaction of North-western South America* to determine and explain the origin and development of ceramic styles of the Greater Antilles. They found strong stylistic affinities between the pottery from Malambo (Colombia) and Las Tortolitas (Venezuela), and the Chicoid pottery from the Dominican Republic. The stylistic similarities were attributed to a wide range of close and constant contacts that must have existed between the bearers of the above mentioned pottery (Arvelo and Wagner 1984: 54-55). Following Binford (1972: 204), they conceived the sphere of interaction as a matrix of intersocietal articulations, maintained regularly and institutionally in a determined area (Arvelo and Wagner 1984: 54).

Adapting the concept to the late prehistory of north-central Venezuela a few observations should be made. As will be discussed later, the Spanish Conquerors noticed the cultural and linguistic unity of Amerindians living in north-central Venezuela (Biord Castillo 1995). Similarly, the late prehistoric pottery recovered within the same region shows striking stylistic similarities. These similarities are considered the material evidence of some kind of relationship that existed between the archaeological cultures/peoples and societies that produced and/or used them.

From Palaeo-Indians to first pottery bearers

The analysis of the sediments from the Lake Valencia indicates that during the Late Quaternary, more than 10,000 years b.p., the basin was not as hospitable a region for human settlers as it is today. The climate was very arid, the vegetation was dominated by xeric plants, and the area of the future lake was occupied by salt marshes (Bradbury et al. 1981). Nevertheless, the archaeological evidence indicates that bands of Palaeo-Indian hunter-gatherers penetrated the region with some frequency.

In the decade of the 1950s, a few Palaeo-Indian projectile points had been recovered in the Valleys of Aragua and Caracas (Cruxent and Rouse 1958; Oramas 1956). Since then, amateurs have located new Palaeo-Indian sites of variable dimensions and artefactual composition, and have collected many isolated stone artefacts (Szábadics n.d.; Andréj Sýkora and Alexis Rojas, personal communication 1995 and 1996). The presence of new Palaeo-Indian sites in the region has also been recently confirmed by archaeologists (Lilia Vierma and Arturo Jaimes, personal communication 1996).

The lack of systematic research of the Palaeo-Indian sites in central-north Venezuela precluded the reconstruction of specific subsistence patterns of these early inhabitants or transients. However, it is known, that they utilized projectile points of cylindrical section, very similar to those described for the El Jobo Complex. The sites related to this complex are concentrated in the northern part of Falcón State, to the north-west of Lake Valencia, and are associated with dates ranging between 14,000 and 12,000 b.p. (Cruxent and Rouse 1956; Oliver and Alexander 1990).

Lake Valencia had begun to take its modern shape and volume around 10,000 b.p.; however, the modern vegetation associations established themselves in the area later, about 8500 years b.p. (Bradbury et al. 1981).

By 6000 b.p., along the Venezuelan coasts and islands, the Archaic or preceramic subsistence economies based principally upon fishing, gathering of plants and animals, but principally oriented toward the exploitation of marine bivalve molluscs, had begun to emerge. The material indicators for this period are: the first appearance of ground stone artefacts, for the beginning of this period, and the first pottery production, for its end (Rouse and Allaire 1978). The Venezuelan examples of these Archaic cultures were probably embedded into a wider pan-Caribbean cultural horizon (Kozlowski 1974).

To the west of the Valencia Basin, many Archaic shell middens have been located (Cerro Iguanas, Indio Libre and El Heneal sites, which were associated with radiocarbon dates between 6000 and 3400 b.p.; Rouse and Cruxent 1963). Only one Archaic complex, namely Cabo Blanco, has been located on the central Venezuelan coast, near Catia La Mar (Cruxent and Rouse 1958). The artefacts typical of all these sites are grinding and hammer stones, and a stone anvil recovered from El Heneal shell midden (Cruxent and Rouse 1958). From the interior of the mainland, in Valencia city, Cruxent reported an assemblage of ground stone artefacts, grouped into the Michelena Complex. It included manos and axes with cylindrical section, and one grinding stone (Cruxent and Rouse 1958: 305). During the last few decades, many other sites with artefacts not yet described, but similar to the

Michelena and Cabo Blanco Complexes, have been reported from the Valencia Basin and the adjacent coast (Szábadics n.d.).

All stone artefacts recovered from the coastal shell middens might have been used in the processing of molluscs or other marine organisms. However, the grinding stones, recovered both from the coastal sites and from the Michelena Complex, may indicate that the diet would have been complemented with gathered and/or harvested vegetables. In fact, the presence of probable vegetable processing tools in the Michelena Complex may indicate sustained foraging and 'initial domestication' (Rindos 1984; Pearsall 1995). However, these artefacts could have also been used in processing marine salt or mineral colorants. Only contextual and environmental approaches in the excavations of these Archaic sites can shed light on the nature of subsistence activities and their social/ideological concomitants. On the other hand, the paleoclimatic and ecological research in the Valencia Basin, has yet to be integrated to and correlated with evidence of human intervention and subsequent intensification of exploitative and extractive activities.

Between 4500 and 2000 b.p., the Archaic people had developed the skills of navigation, and populated the islands of Aruba, Curaçao and Bonaire, situated close to the north-western Venezuelan coast (Haviser 1989; 1991; Versteeg et al. 1990). Aruba Island is located close to the mainland (Península de Paraguaná), and is not separated from the continental shelf in contrast to the true oceanic islands situated to the east. Curaçao and Bonaire islands are located close to Aruba and to each other, so navigation between them and the mainland would have required neither crew nor craft specialisation. However, navigation from the mainland to the islands located off the central Venezuelan Coast, namely La Orchila, Los Roques and Las Aves Archipelagos, would have required specialisation of both human and material components, and involved considerable risks for human life. The oceanic type islands are located over 135 km in straight line from the coast, and the sea between them and the coast reaches the depth of almost 1000 meters. The absence of Archaic sites and artefacts on these islands may suggest that they were not reached by the Archaic settlers of Aruba, Curaçao and Bonaire. Perhaps navigation from the mainland exceeded the technological capability and/or the knowledge and skills of the Archaic men. However, unfavourable economic conditions or religious reasons could also have prevented this enterprise.

Certainly, one of the most important issues to be investigated in the region is the transition from Palaeo- and Meso-Indian hunting/fishing/gathering economies to sustained foraging and agriculture of the pottery bearing farmers, and the concomitant techno-economic changes.

The arrival of pottery-using farmers

By the time of Christ, the first pottery-using Amerindian groups reached north-central Venezuela. They were the Tocuyanoids, bearers of painted pottery that persisted in the archaeological record from 400 b.c. until a.d. 400 (Arvelo 1995). The Tocuyanoids migrated far from their cultural homeland located in the Tocuyano (Quibor area), and about a.d. 20±70, settled down on the at central Venezuelan coast, at the site of Cerro Machado (Cruxent and Rouse 1958). Considering the material I have consulted in a private collection, the Tocuyanoids also settled the beach of Ocumare Bay, to the west of Cerro Machado. The most frequent attributes of the ceramic assemblage from Cerro Machado are white slip, painted designs, hollow legs and tripods. According to Cruxent and Rouse (1958), these characteristics represent a simplified version of Tocuyano style pottery.

The location of the above mentioned settlements, very close to the seashore, seems to indicate that their inhabitants were engaged in maritime exploitation: fishing and/or gathering. According to Cruxent and Rouse (1958), the Cerro Machado site contained considerable amounts of molluscs and animal bones, distributed in a two meter thick layer. In 1996, I located the few last patches of the original site. The great deal of fish vertebrae and sea urchin remains I found at the site seems to suggest that marine resources had a great importance for Cerro Machado's occupants. Even though it is assumed that they were also engaged in agricultural activities there is no data available to prove this hypothesis. It is noteworthy that despite quite extensive excavations carried out by Cruxent and his followers no fragments of *budares* (clay griddles) have been found at the Cerro Machado site (Cruxent and Rouse 1958). *Budares* were also not recovered during the excavation of the main Tocuyanoid locality at Tocuyano (Cruxent and Rouse 1958). The subsistence economy of the Tocuyano site has been associated with the cultivation of maize (Sanoja and Vargas 1974); however, there is not yet any direct evidence to support this hypothesis (Arvelo 1995). Unfortunately, in absence of systematically recovered archaeobotanical, zooarchaeological and contextual data, the question whether maritime or agricultural resources dominated the diet of coastal Tocuyanoids, can not be resolved.

The shift in the subsistence economy that would have accompanied the movement of the Tocuyanoid farmers from the inland mountains to the seashore, calls for explanation. It can be hypothesised, that once on the seashore, the Tocuyanoid newcomers started to develop new skills and technologies, as well as assimilate knowledge necessary to exploit the marine resources and, in this way, to complement their traditional foodstuffs obtained through farming and hunting. During this process they would have been assisted by the remnants of Archaic fishers and gatherers related to the Cabo Blanco Complex. However, no direct archaeological evidence can support this hypothesis.

TABLE 1. ***Radiocarbon and TL uncalibrated dates from the archaeological sites in the Valencia Basin, Valley of Caracas and the Central Coast of Venezuela.***

Complex Series	Site	Sample code; laboratory	Context/ depth (cm)	Years b.p.	Years b.c./a.d.	Reference
			Archaic Period			
Complex						
Michelena?	Morro de Guacara	GX-1180	human bone; 40 cm	4200 ±20	2250 b.c.	Peñalver 1976
			Ceramic Period			
Series						
Tocuyanoid	Cerro Machado	Y-457	refuse area?	1930± 70	a.d. 20	Cruxent & Rouse 1958
Barrancoid	Aserradero	Y-579	shell midden?	1640±120	a.d. 310	Rouse & Cruxent 1963
Barrancoid	Aserradero	Y-580	shell midden?	1615±120	a.d. 335	Rouse & Cruxent 1963
Ocumaroid?	Puerto Carayaca	IVIC-577	vegetal carbon?; 1.05 m	1050± 70	a.d. 900	Armand 1976
Valencioid	Los Cerritos	Geochron Lab. Inc.	human bone; 80 cm	1025±115	a.d. 925	Peñalver 1969
Valencioid	La Mata	Y-630	midden	1000± 70	a.d. 950	Rouse & Cruxent 1963
Valencioid	La Mata	Y-632	midden	1000±100	a.d. 950	Rouse & Cruxent 1963
Valencioid	La Mata	Y-631	midden	980±110	a.d. 970	Rouse & Cruxent 1963
Valencioid	Valle de Chuao	IVIC	pottery?	744± 98	a.d. 1206	Morales 1984
Valencioid?	El Cafetal, (Caracas)	Teledyne Isotopes	human bone	490± 75	a.d. 1460	De Bellard 1982

Soon after the arrival of Tocuyanoid people, the region witnessed the arrival of new immigrants. These were the Barrancoid pottery-using farmers who arrived from the far south-western flood plains of the lower Orinoco (Sanoja 1979). The Barrancoid people established one permanent settlement at La Península de La Cabrera, on the north-eastern shore of Lake Valencia. For this habitation and burial ground they had consciously chosen one of the best strategic spots in all the surroundings of the lake. According to Cruxent and Rouse (1958), the Barrancoid pottery has also been recovered in the area of Puerto Cabello, on the nearest seashore. Three sites, Trompis, Aserradero and El Palito, are the remnants of the second fairly large and stable group of Barrancoid settlements in the region. These sites were located close to the mouth of a river, and near the best natural port on all the central coast. The Barrancoid immigrants selectively took possession of the best two geographical loci in the region that were additionally interconnected through a natural passage of Las Trincheras. Apparently smallersized Barrancoid settlements were also scattered along the surrounding coast, including Patanemo and Ocumare bays.

Unfortunately the chronological sequence of all these Barrancoid settlements is unknown. Only two radiocarbon dates were obtained for Barrancoid sites of the El Palito area: a.d. 310 and 335 ± 120 (Rouse and Cruxent 1963). Based on the nature of El Palito sites and the composition of their archaeological remains (Cruxent and Rouse 1958 vol.1: 156-164) it can be supposed that they were multicomponent deposits. However, no detailed data was given about the contextual associations of the radiocarbon samples within these sites.

Cruxent and Rouse (1958), interpreted the Barrancoid site at El Palito as a permanent village of considerable size. Human burials, a great deal of pottery including *budares*, as well as fish and crustacean remains, marine shells, and mammal bones of manatee, peccary, and deer, were recovered at this site (Cruxent and Rouse 1958). The composition of faunal remains suggests that the Barrancoids exploited both marine and terrestrial environments.

The absence of Barrancoid artefacts on the islands located off the coast (Las Aves, Los Roques, La Orchila, and La Tortuga) seems to suggest that the Barrancoid people of north-central Venezuela were not oceanic seafarers. Was it due to the insufficient technique and/or knowledge necessary to cross the open sea? Was it lack of economic interest, or religious constraint? According to my preferred hypothesis, the Barrancoids, to avoid the physical and/or ideological risks of high sea navigation considered it more advantageous to strengthen alliances with their closest neighbours. If these neighbours were predominantly fishers and seafarers, the Barrancoids could participate, through the mechanisms of reciprocity, in the benefits of marine environments. On the coast near El Palito and Ocumare, these neighbours of the Barrancoid groups were the bearers of a new Ocumaroid ceramic style.

The Ocumaroid pottery comprises few diagnostic characteristics such as annular and annular perforated bases, absence of handles and a low frequency of legs. The red and black over white painted pottery, with designs of parallel lines, triangles and ladder-like forms, are its other diagnostic elements (Rouse and Cruxent 1963). However, the stylistic definition of Ocumaroid pottery is one of the weakest. Each of styles that comprises this series displays a wide range of its own stylistic elements. The Aroa and Palmasola styles share certain elements with the western Dabajuroid series, while the easterly Ocumaroid style from Boca Tacagua, is clearly influenced by the Saladoid series from the east (Rouse and Cruxent 1963: 104). The chronology of the Ocumaroid series is also weak. Cruxent and Rouse (1963) recognised that it was the weakest among all Venezuelan series; no one of the styles that composes it has been found in stratigraphic position.

The origin of Ocumaroid pottery is fairly enigmatic. It first appeared at the time when coastal Tocuyanoids and Barrancoids were exposed to the influences of bearers of Saladoid pottery. Starting from their homeland located on the eastern Venezuelan coast (the Saladero type site), the Coastal Saladoids had been navigating westward, along the coast, during the first centuries after Christ (Vargas 1979). The material evidence of these movements is very scarce on the western part of the central coast; as a result we know nothing about their nature and dynamics. Only few typical Saladoid white on red painted sherds have been found scattered among El Palito Barrancoids sites (Cruxent and Rouse 1958: 161). Were they warlike incursions or trade expeditions? On the central-western coast, only the site of Taborda retained much of Barrancoid's stylistic uniformity until the European Conquest (Cruxent and Rouse 1958) and it can be hypothesised that toward the last centuries of the first millennia after Christ the Ocumaroid groups dominated this part of the coast. The ceramic assemblage from Ocumare, the

Ocumaroid type site in this part of the coast, shows many stylistic similarities with the Tocuyano style, from the mountains situated to the south (Cruxent and Rouse 1958).

Meanwhile, on the central coast, the Tocuyanoid pottery from Cerro Machado disappeared from the scenario. An extensive Ocumaroid settlement appeared at the site of Boca Tacagua, very close to the Tocuyanoid settlement at Cerro Machado. According to Cruxent and Rouse (1958, vol.1: 178) many painted designs from Boca Tacagua style 'duplicate' these of Saladero, the main (*cabecero*) style of the Saladoid Horizon. Could the Boca Tacagua style represent the final result of the following cultural processes? If by the time when the Tocuyanoids had entered the central coast area this was still inhabited by Archaic peoples, it is possible to hypothesise that the newcomers assimilated part of their cultural baggage. Afterwards, were they culturally absorbed or acculturated to the coastal Saladoids? Were these inter-group contacts warlike, or rather peaceful relationships that could include a wide range of social interactions such as commercial visits, marital exchanges or mixed fishing parties? The loss of cultural identity by the Tocuyanoid people points toward the strong interaction that would have included warfare, and/or political/economic forcible activity. The bearers of Boca Tacagua's Ocumaroid pottery could have emerged as a result of these interactions. Similar processes could intervene in the formation of the Ocumaroid type site in Ocumare.

Emergence of the Valencia Basin sphere of interaction

The majority of scholars agree that by the last two centuries of the first millennium ad, the Valencia Basin was the hearth of the Valencioid series. It has been suggested that this was a local development, strongly influenced by the bearers of Arauquinoid and Valloid pottery from the Middle Orinoco area (Cruxent and Rouse 1958; Sanoja and Vargas 1974; Tarble 1985; Zucchi 1985; Tarble and Zucchi 1984).

Rouse and Cruxent (1963) considered the Valencioid series as a 'degeneration' of the Barrancoid series with the addition of stylistic Arauquinoid elements. I favour the hypothesis of slow transculturation between groups of Arauquinoid pottery bearers and the remnants of Barrancoid lake dwellers. This rather weak interaction, that would have included such sociable activities as trade, intermarriage or religious visits, would have resulted in a local development of Valencia culture (see Rouse 1986).

A few outstanding features of the Lake Valencia archaeological record can be enumerated and discussed. While there is evidence of artificial mounds on the western and eastern Lake Valencia shores (Marcano 1971[1889-1891]; Jahn 1928; Requena 1932; Bennett 1937; Osgood 1943; Cruxent 1958, Peñalver 1969; n.d. b, among others), it is not known whether or not these are all contemporaneous. The archaeological features of that area include stone walls, graves and enclosures (Oramas 1942). The recoveries of a few gold objects have also been reported (Marcano 1971[1889-1891]; De Bellard

1978). Additionally, the area has the highest concentration of petroglyphs in all the country (de Valencia and Sujo Volsky 1987; Rojas and Thanyi 1992).

Regarding the early settlement history of the area, as suggested by Bennett (1937), the Valencioid people lived initially in the stilt pallafitte dwellings built on the areas that flooded. Further, during the period of regression of the water level, they constructed a series of mounds that served as dwelling sites and/or burial grounds. The Valencioid burials were generally, but not exclusively, interred in ceramic urns. Inside and outside the urn there were offerings composed of clay human figurines, decorated pottery, and necklaces made out of stone, bone and marine shells.

Unfortunately, the social and symbolic rules that underlay the differentiation of the mortuary practices are practically unknown. According to Oramas (1917), the modern inhabitants of that region maintained that the burials with offerings were those of 'rich' Indians, while those without offerings were the 'poor' Indians. Despite the long list of contributions to physical anthropology of the region (Marcano 1971[1889-1891]; Jahn 1932; Dupouy 1943; Cruxent 1945b; Anuario 1964; Peñalver 1969; Arechabaleta 1979; Lagrange de Castillo 1979; Ortega de Mancera 1979; De Bellard 1982; Montcourt de Kosan 1983), the articulation between the results of the bio-physical analysis of human remains and the contextual evidence has not been attempted. Consequently, any inferences about the stratification of Valencioid society, drawn from the evidence recovered from the burial variability, can hardly surpass the level of intuition. Likewise, the intriguing problem of the social significance of cranial deformations practised by Valencioid people is largely speculative (Dupouy 1943; Requena 1947; Peñalver 1969).

Probably the most distinctive artefacts of Valencioid's material culture are the clay human figurines. Even though almost all Valencia style figurines lack contextual data they are sensitive indicators of ideological and social realms of these extinct societies (Antczak n.d.). Objects that can be considered as purportedly loaded with ceremonial meaning, such a deer bone flutes, clay pipes, burners, rattles and whistles, may indicate the ritual complexity of Valencioid societies. The presence of Barrancoid clay pipes in Valencioid archaeological contexts may also suggest that the symbolism of smoke could have been inherited from the early La Cabrera and El Palito inhabitants.

The Valencioid artisans were not only good potters but also skilful in the manufacture of utensils and ornaments made out of bone, stone and shell. Marine shells that abound in the burials may have had a high economic and symbolic value in Valencioid societies.

During the last three or four centuries before the European Conquest, pottery with Valencioid characteristics had scattered out of the Valencia Basin. To the east, these ceramics have been recovered in the Valley of Caracas, on the Littoral Central, in such sites as El Topo, Puerto Carayaca and Marapa (Cruxent 1949; Jam 1958; Cruxent and Rouse 1958; Rouse and Cruxent 1963), and on two islands of the Los Roques Archipelago (Jam 1956). The Valencioid ceramics had also spread along the north-eastern coast, to the sites of Los Caracas, Osma, and Caruao (Alexis Rojas, personal communication

1996), and maintaining proximity to the seashore, these wares have also been recovered on the Barlovento plains, at the sites of Cueva Cruxent, Chirimena, Río Chico and Cúpira (Cruxent and Rouse 1958; Cruxent 1949; Nieves 1979, 1983, 1992). Farther to the east, a few Valencioid shards were detected on the islands Cubagua and Blanquilla (Cruxent and Rouse 1958; Rouse and Cruxent 1963; Antczak and Antczak 1989c; 1991a).

The spread to the west was relatively minor, as can be inferred from the virtual absence of Valencioid ceramic traits in the late prehistoric ceramic assemblages of the Yaracuy River depression and the Quibor area (Wagner and Arvelo 1991; Arvelo and Wagner 1993; Arvelo 1995). The presence of the Dabajuran chiefdom, located in the northern part of the Falcón State, seems to have restrained the Valencioid spread along the western coast (Antczak and Antczak 1991; Oliver 1989; 1997). However, some characteristics of Valencioid pottery were reported from the area of Lake Maracaibo (Fase Zancudo [Sanoja 1969]). To the north and west of Lake Valencia, Valencioid pottery has been reported from a series of coastal bays such as Puerto Maya, Chuao, Cata and Cepe (Alvarez and Casella 1983; Morales 1984; Martín 1995).

Chapter Four

Ethnohistory of north-central Venezuela: Who left the archaeological remains?

> ...poco destruyeron los conquistadores [en la Cuenca del Lago de Valencia], porque fue poco lo que encontraron [...]. Los 'Cerritos' construidos en remotas épocas yacían abandonados y ocultos [...] Nada parece indicar que las tribus históricas tuvieran la tradición de los 'Cerritos'. Los conquistadores los desconocieron...
>
> Requena 1932: 259

The archaeological record can confirm or refute many inferences about the past societies derived from the ethnohistoric data only. This chapter discusses the ethnohistory of the 16th century Amerindian societies from north-central Venezuela, in order to provide data that will be contrasted with the archaeological data recovered on the off-shore islands.

The following discussion relies mainly on the data contained in the *Relación de Nuestra Señora de Caraballeda y Santiago de León* written by Juan de Pimentel in about 1578. As a consequence, wherever in this chapter no specific author citation is provided it should be assumed that the information has been extracted from the *Relación* of Pimentel.

Pimentel was the Governor and General Captain of the Province of Venezuela between 1576-1583 and wrote the *Relación* as a series of responses to the official questionnaire send by the King Felipe II. The aim of this set of questions was to gather and systematise the knowledge about the resources, potentialities and limitations of the overseas territories of the Spanish Crown (Biord 1995: 107). The *Relación* is the main direct and primary ethnohistoric source about the aborigines from north-central Venezuela; its data are highly trustworthy since Pimentel often personally gathered them during his visits to Amerindian villages (Biord 1995: 110). The data concerned the Conquest of the Province of Caracas, contained in the *Relación*, was amply analysed by Hno. Nectario María (1979 [see also Dupouy 1945]). Recently, Biord (1995), carefully evaluated the ethnohistoric content and validity of both Pimentel's and Oviedo y Baños's data. He suggested that Oviedo y Baños, who in 1723 published the *Historia de la Conquista y Población de la Provincia de Venezuela*, had to utilise a manuscript that was originally prepared by Fernán Ulloa, soldier and poet, requested by the town council of Caracas in 1593 (Biord 1995: 215). This unknown manuscript could contain detailed information about the *Caraca* Indians that was collected by Ulloa directly from the still living conquerors of the Province of Caracas. For this reason the data contained in the chronicle of Oviedo y Baños will also be used here.

Other primary, although more general, sources consulted were written by Antonio Barbudo (1964[1570-1575]]) and Juan de Castellanos (1962[1589]).

The Province of Caracas and its Conquest

During the mid 16th century the Province of Caracas comprised the coastal range of north-central Venezuela, stretching between Cabo Codera to the east and the village of Borburata, near Puerto Cabello, to the west (Barbudo 1964[1570-1575]). To the north, it embraced the islands of Las Aves, Los Roques and La Orchila, as well as La Tortuga Island, situated to the north-east. Since the archaeological remains recovered on these islands are examined in this dissertation, the ethnohistory of the inhabitants of the Province of Caracas, will be emphasised. To the south, the Province included the Cordillera de la Costa mountain range and the valleys of Caracas and Tuy (Pimentel 1964[1578]).

The border of the Province of Caracas was not defined in any legal-administrative terms, in contrast to the Province of Venezuela, the larger early colonial administrative unit of this region. This border rather emphasised the geographic homogeneity of the Province of Caracas and, as will be shown later, also the cultural and linguistic unity of its inhabitants (Biord 1995).

By the mid 16th century, the central coast and both slopes of the Cordillera de la Costa, were inhabited by the *Caraca* Indians (Barbudo 1964[1570-1575]; Pimentel 1964[1578]; Agreda 1964[1581] in Biord 1995: 201; Oviedo y Baños 1982[1723]). The *Caraca* was the first Indian group of the Province contacted by the Spaniards, even though it was not the most numerous in that region (Oviedo y Baños 1982[1723]). The name *Caraca* was given to all the Province (*Provincia de Los Caraca* or *de Caracas*), and has also been used, by extension, to describe all aboriginal groups of north-central Venezuela who, weapons in hand, resisted the Spanish colonisation. The term *Caraca* was also extended to the language used by the Amerindians of the Province.

In 1555 Francisco Fajardo assisted by the *Guaiqueri* Indians from Margarita Island attempted to colonise the coast of the Province of Caracas, and later, in 1560 penetrated in to the Caracas Valley (Oviedo y Baños 1982[1723]). Seven years later the city of *Santiago de León de Caracas* was founded, although the region was still rebellious (Nectario María 1979). At the beginning of 1568, under the

TABLE 2. *Population of the Province of Caracas between 1571-1607**

Date	Estimated population	Reference
1571-1574	10.000 - 12.000	Juan López de Velazco 1964[1574]
1578	7000 - 8000	Juan de Pimentel 1964[1578]
1607	2600	Diego Villanueva y Gibaja 1964[1607]

* taken from Biord 1995: 125

chief *Guaicapuro,* all confederated Indians of the region commenced their last offensive against the conquerors. By the time of Governor Pimentel's *Relación* (1578), the region was largely pacified. The process of assignment (*repartimiento*) of the Amerindians, as well as their conversion to Christianity and settling (*reducción*) in missions, began all over the Province (Biord 1995: 157).

Demography

In 1578, Pimentel reported that, from an overall number of about 7000 to 8000 Amerindians of the Province, approximately 4000 lived close to the towns of Caracas and Caraballeda. Oviedo y Baños (1982[1723]: vol.2: 397) reported that in 1568 the confederated forces of *Caraca* Indians under the chief *Guaicaipuro* reached as much as 14,000 warriors. The real number of these warriors must have been much smaller if we consider that about 10000 inhabitants for all the Province were reported by that time by López de Velazco (1964[1574]). Oviedo y Baños probably exaggerated the number of the indigenous warriors to magnify the victory of the considerably less numerous Spaniards. As shown in the Table 2 the indigenous population of the Province was reduced by 3/4 in about 30 years.

Pimentel attributed this drop in aboriginal population to the effects of epidemic diseases such as smallpox (variola major), measles (rubeola), diarrhoea, catarrh and flu, as well as to the results of the pre-conquest internal battles, and a war against Spaniards. He emphasised that, after the city of Caracas was populated, smallpox and measles caused the death of a third of the local indigenous population (Pimentel 1964[1578]). The epidemics of smallpox reported in 1580/81 and 1587-1590 in vast areas of northern part of South America produced up to 90% mortality of Amerindian populations (Oviedo y Baños 1982[1723]); Morey 1979: 82; see also Hern 1994).

Linguistic considerations

In the mid 16th century, along the Caribbean shore, stretching from the Península de Paria to the east to the central Venezuelan coast to the west, Amerindians spoke Carib languages (Loukotka 1968; Civrieux 1980; Durbin 1985; Migliazza 1985; Oliver 1989). Durbin (1985) labelled them Coastal Caribs and classified them into a Northern Branch of Carib languages that spread from their homeland in the Guiana land mass, where the largest geographical and numerical concentration of Carib languages has been found. According to lexicostatistical dates regarding the expansion of Carib speakers, a Proto-Carib began to diverge about 4.4 millennia ago (Layrisse and Wilbert 1966). Oliver

(1989: 225) suggested, based on linguistic, as well as archaeological evidence, that Coastal Carib diverged out of the Northern Carib branch about 2.3 millennia ago.

According to the classification of Durbin (1985: 346, 358), the *Chayma, Cumanagoto* and *Yao* were considered as a Coastal Carib languages while *Píritu, Pariagoto, Palenque, Tiverigoto* and *Caraca* were considered as dialects. The sole Coastal Carib language spoken outside the coast was *Tamanaco,* spoken in 16/17th centuries in the Middle Orinoco area. Not one of the Coastal Carib languages from the Venezuelan coast has survived into the modern times.

Durbin (1985) found certain affinities between these extinct languages and the series of dialects of the *Yukpa* and *Japreria* Indians, who nowadays inhabit the Sierra de Perijá mountains, on the border between Venezuela and Colombia. Further, he suggested that the *Opone* and *Carare* extinct Carib languages, from north-eastern Colombia, were more closely related to *Yukpa* than to any other surviving Carib language. This distribution suggested to Durbin a movement of Carib speakers from the eastern and central Venezuelan coast through the plains into the Lake Maracaibo area, then north into the Sierra de Perijá, and also south through the foothills of this Sierra, and down the Magdalena River (Durbin 1977: 30; 1985: 346, 349). Oliver (1990: 89) suggested that the segmentation and divergence of the Caribs from eastern and western coast could have occurred in a more 'centric' point, on the plains (*llanos*), from where the two segments of the same proto-group could moved in opposite directions: one toward Lake Maracaibo and the other toward the eastern coast. The time of these movements remains to be determined.

It is still a matter of controversy whether or not the *Caraca* Indians from north-central Venezuela spoke a Coastal Carib language (Loukotka 1968[1935]; Acosta Saignes 1946), or whether it was a Coastal Carib dialect (Durbin 1985; Migliazza 1985; Biord 1995).

Civrieux (1980: 40), based on the ethnohistoric sources, observed that the central (*Cumanagoto*) and eastern (*Chaima*) Carib-speakers from the coast denominated themselves *Choto* (people, human beings) and spoke dialects of the same language (*chotomaimu*) that permitted communication between them (see a map in Butt Colson and Heinen 1983-84: 8). He suggested that their western neighbours such as *Caraca, Teque,* and *Meregoto* would have also been considered as *Choto* and spoke a dialect of *chotomaimu.* If however, as suggested by Civrieux (1980: 37), the suffix *-goto* in Carib language means 'the inhabitant of, or dweller of' (just as *Cumanagoto* can be read as the inhabitant of Cumaná) so the *Meregoto* and *Esmeregoto* fits well into this linguistic structure of Carib language. Moreover, the denomination of the *Toromaym(n)a* or *Toromayma* Indian group from the Valley of Caracas and the adjacent coast seems to indicate a possible relation with the word *chotomaimu.* According to their oral history, they were proceeding from the ancestral land called *toromayma* and were newcomers to the north-central Venezuela (Pimentel 1964[1578]). My intention is not to go deeper into the linguistic matter but rather to indicate other possible linguistic relations between the *Caraca* and their eastern neighbours. What is doubtful, according to the ethnohistoric sources (Tauste 1888[1680]), is that *Caraca* was the westernmost Carib language/dialect on the Venezuelan coast. Since the data are insufficient to determine if *Caraca* was a language on its own right or a dialectal variant of an indeterminate Coastal Carib language, for ease of discussion I will call it *Caraca* 'language'.

The classification of *Caraca* as a Carib 'language' is based on ethnohistoric information and modern lexical comparisons. The ethnohistoric data were provided by the Jesuit missionary Felipe Salvador Gilij, in 1782 (1965). Gilij lived between 1749 and 1767 in La Encamarada mission, located on the southern bank of the Middle Orinoco River, and learned the *Tamanaco* Carib language spoken there (Biord 1985: 84). After the expulsion of the Jesuits in 1767, Gilij had to leave the country, but before embarking for Italy he spent few months in La Guaira port, on the central Venezuelan coast. He noted there that the *Caraca* 'language', spoken by one native boy from La Guaira, was closely related to the *Tamanaco* language (Biord 1995: 162). This affinity seems to confirm not only a linguistic, but also a complex and long-lasting cultural relationship between the Caribs from the Middle Orinoco area and those from the central and eastern Venezuelan coast (Henley et al. 1982; Arvelo-Jiménez and Biord 1994).

Another confirmation of the classification of the *Caraca* as a Carib 'language' comes from the lexical comparisons performed by Biord (1993). Based on the Pimentel's *Relación*, he compiled a list of words of a possible *Caraca* 'language' and, hypothetically, reconstructed the consonant phonemes of these words. Further, these purported phonemes were compared to the consonant systems of the ancient Carib languages such as *Chaima, Cumanagoto* and *Tamanaco,* as well as to the modern *Kari'ña, Pemón* and *Yukpa* Carib languages. He found regular phonologic correspondence between them, supporting the inclusion of the *Caraca* 'language' into the Carib linguistic stock (Biord 1993), supporting the previous classifications (Loukotka 1968; Durbin 1985; Migliazza 1985; Oliver 1989).

The *Relación* of Pimentel also enumerated the *Guayqueries* among the Indian groups that inhabited the Province of Caracas (Pimentel 1964[1578]: 113) what points toward the cultural and/or linguistic affinity between the *Guayqueries* from the Margarita Island and these from the north-central Venezuela. Unfortunately, there is not enough space here to deepen this matter; however, as it was mentioned before it should be underlined that during the 16th century, only the chief *Naiguatá* (and his villagers?) can be considered as an direct descendant of the *Guayqueries* on the central coast. The question whether the *Guaiquerí* was related or not to the *Caraca* 'language' can not be answered without the analyses of additional ethnolingüistic data (see also Acosta Saignes 1954: 222-225).

The data regarding the unity and intelligibility of the 'language' spoken by the Amerindians of the Province of Caracas is provided by the *Relación* of Governor Pimentel, who stated that 'the language of all this province and nation [...] is only one and in general caraca' (Pimentel 1964[1578]). However, Pimentel also mentioned certain linguistic variance within the Province by saying that 'certain [*Caraca*] nations differ each from other in certain things, as Castilla and Montañas, Galicia and Portugal, and lastly they can understand each other' (Pimentel 1964[1578]: 119). Biord (1995: 129, 132), suggested that the Indians of the Province would have pertained to one ethnic group divided into sub-groups that spoke dialectic variations of the same language. I am inclined to agree with this hypothesis even though I recognise that it needs additional ethnohistoric and/or linguistic studies to assess its validity.

It was also noted that there were significant differences in the language spoken by different Carib 'nations' (*naciones*) along the central and eastern Venezuelan coast; however, this linguistic diversity does not seem to have prevented mutual understanding amongst the Indians themselves (Tauste 1888[1680] in Henley 1985: 154). However, to what extent these differences reflect the overall linguistic or dialectical distinction are questions that only further comparative linguistic studies can determine or not (see Butt Colson 1983-4: 101; Henley 1983-4: 158).

Settlement pattern

Pimentel (1964[1578]) observed that the villages of the *Caraca* Indians were dispersed among the hills and ravines of the valleys and highlands of the interior. Towards the coast, they were scattered on both slopes of the Cordillera de la Costa. This dispersed settlement pattern is distinctive to many lowland Amerindian groups that practise slash and burn rotation agriculture. The *Caraca* villages were described as being small in size, and composed of three to six houses. This settlement pattern of nucleated rather than single communal house village is consistently described for many 'nations' of the *Caraca* Indians (Oviedo y Baños 1982[1723], vol. 2: for the *Teques* Indians: 522, 518; for the *Mariches*: 410; see also pp. 446, 448 for other 'nations'). We can hypothesise about the average number of the *Caraca* villagers by analogy to the contemporary Carib villages; the average of the Carib settlement in Guyana is about 30 persons and rarely exceeds 50 people (Rivière 1995: 198). Taking into account the warfare in the *Caraca* territory it seems probable that there was a minimal size for the village below which it become vulnerable to attack. For instance, the communal structure (*shabono*) of the warlike Yanomamö Indians houses about 45 people (Chagnon 1968: 138).

Pimentel seemed to suggest that small villages (*barrios*) inhabited by kin relatives and no-kin-related co-residents were forming clusters of larger units (*poblaciones* or *pueblos*), separated by larger distances. Even though Biord (1995: 185) identified *barrios* as a sections or parts of a village (*pueblo*), my interpretation fits well into the model of Carib social structure he elaborated (Biord 1995: 187). The larger social-political units (*poblaciones* or *pueblos*) were located at intervals of 2.7, 5.5, 11 and 17 kilometres from each other (Biord 1995: 202), and their inhabitants probably spoke different dialects. Additional temporary huts were also constructed close to the cultivated fields (Oviedo y Baños 1982[1723]).

Pimentel viewed all the villages of the *Caraca* as temporary and ephemeral. These villages were obviously not geometrically arranged like their European counterparts, and the houses were constructed with perishable materials instead of with stones and bricks (see Biord 1995: 185). So, the apparent lack of planned spatial organisation of the villages and the impression of structural weaknesses of the houses probably influenced Pimentel's appreciation. Nevertheless, Pimentel's data also permit us to infer that *Caraca* were a semisedentary groups with patterns of mobility associated with the periodical shift in the location of their cultivation fields. The settlements of the contemporary Guiana Caribs are short-lived with an average duration of about six years due to the exhaustion of the economic resources (food and raw materials) in the vicinity, infested thatches or misfortune i.e. the dead of the leader (Rivière 1995). Such factors as a high population mobility between settlements (Rivière 1995) and the mobility and nucleation of settlements as a defensive response to the warfare (Redmond 1994b) would also influence the notion of the ephemerality of the Carib settlements. From Pimentel's *Relación* it can also be inferred that temporary campsites of the *Caraca* coastal groups were scattered on the islands of Las Aves, Los Roques, La Orchila and La Tortuga.

Subsistence economy

The *Caraca* Indians from the interior valleys of Caracas and Tuy were basically slash and burn horticulturists. According to Pimentel (1964[1578]) their staple crops were maize (*Zea mays* L.), bitter manioc (*Manihot esculenta* C.) and sweet potato (*Ipomoea batatas*) (see Biord 1995: 138). Other cultigens such as peanuts (*Arachis hypogaea*) and beans had a secondary importance among the *Caraca*. Even though many edible fruit trees are the integral part of the natural vegetation of the region, Pimentel clearly stated that such fruit trees as *aguacates* (*Persea americana*), guava (*Psidium sp.*), *mamones* (*Talisia hexaphylla*), *guanábanas* (*Annona muricata*), mamey (*Mammea americana*) and *anones* (*Annona* sp.) were cultivated by the *Caraca* (Pimentel 1964[1578]:129-130). The ethnohistoric sources confirm the cultivation of fruit tress by other Carib-speakers to the east (Caulín 1966[1779] vol.1: 42-53; Civrieux 1980: 155). The *Caraca* also cultivated bottle gourd (*Lagenaria siceraria*), cotton (*Gossypium* sp.) and tobacco, as well as *hayo or coca* (*Erythroxylum* sp.). The *hayo* was a stimulant with a high content of alkaloids, and was valued and widely traded by the Carib societies. The leaf was dried and ground into powder, then mixed with a pulverised burnt shells, and chewed by all adult members of Carib societies along the Venezuelan coast (López de Gómara 1979[1552]: 295; Pimentel 1964[1578]: 131). Civrieux (1980: 166-168), based on ethnohistoric sources, noted that the *Cumanagoto* imported *coca* from the north-central part of Venezuela, principally from the *Tomuza* Indians, eastern neighbours of the *Caraca*. One of the few indigenous species of *Erythroxylum* reported for north-central Venezuela (Pittier 1926: 255), could be the one which was cultivated and traded by the *Tomuza* (Civrieux 1980: 166-168), as well by the *Caraca* Indians.

The cultivated fields were preferably located close to the river banks, and the entrances to them were protected by buried poisoned sharp points. Pimentel stated that the *Caraca* did not store their foodstuffs; however, I consider he was referring to 'storage' in European terms that involved such. special constructions as barns or cellars. It is doubtful that the *Caraca* preserved at least the manioc flour in form of *casabe* cakes, as was stated by Pimentel 1964[1578]:126) in an other part of the *Relación*. On the other hand, if fish was traded from the coast to the interior, as was also stated by himself, then it was probably salted and sun dried or smoked. The Carib-speaking *Cumanagoto,* to the east, used to smoke maize kernels that can be storage for a year (Civrieux 1980: 156). From the cooked poisonous juice of the bitter manioc they prepared a beverage of great value in their diet, called *yare.* They also used fermented maize or manioc beverages called *masato* (Pimentel 1964[1578]: 126).

Similarly as the majority of the Indians from the South American lowlands, hunting and fishing provided the major part of proteins to the *Caraca* diet (Gross 1975; Roosevelt 1991). With bow and arrow, they hunted a wide range of neotropical mammals (Dupouy 1946). Their subsistence activities also included the gathering of wild fruits, medicinal plants, vegetal fibres, honey, wax and natural colourings.

The coastal groups were engaged in fishing activities (fish, turtles) and collection of the salt from the natural salt ponds located on the coast and islands (Pimentel 1964[1578]).

Material culture

The material culture of the *Caraca* groups seem to be rather uniform and share many features with other Carib-speaking groups to the east, principally the *Cumanagoto* (Civrieux 1980). However, a few visible differences must have existed between the inhabitants of the inland and those in the littoral strip, due to the differentiation in their habitat and subsistence economies. The inhabitants of the coast engaged in fishing and salt-collecting, used canoes and fishing gear. Since the *Relación* of Pimentel (1964[1578]) provides a very rich data base regarding the material culture of the *Caraca,* it will be cited in this section almost exclusively.

The *Caraca* women wore *guayuco*, a kind of a short cotton skirt, and adorned themselves with necklaces made of beads. Sometimes, they used gold pendants and bracelets. Their legs were tied up in different parts with coloured bandages to deform them for aesthetic purposes; however, these adornments and deformations would have also been the markers of social status, age, group membership, etc. Both women and men tied coloured cotton armbands and painted their bodies.

The men did not use any clothes. They used penis sheaths made with the matured and dried fruit of a bottle gourd (*Lagenaria siceraria*). Chiefs might hang gold anthropo- or zoomorphic figurines around their necks, and use the golden bracelets. Gold pendants were offered to Fajardo by the coastal chiefs *Sacama* and *Niscoto* (Oviedo y Baños 1982[1723]). Chiefs and prominent warriors wore crowns of feathers and skins of animals in warfare and on ritual occasions. In feasts they used masks and engraved wooden animal figures.

Their weapons included hardwood clubs called *macanas*, that were a kind of wooden sword, often engraved and painted. Another common weapon was the bow and arrow whose tips were poisonous.

Caraca wove cotton materials and hammocks, as well and a range of cotton threads and ropes. They also manufactured a wide range of fibre cordage. Pimentel mentions a special type of basket called *cataure* of exclusive feminine use; it used to be filled with all the portable possessions and interred with its owner when she died.

Pimentel mentions spoons, water containers and penis covers made out of bottle gourd, but I suspect that much wider range of utensils were made from these versatile fruit by the *Caraca*. These utensils must have been omnipresent in the *Caraca* settlements and houses.

In the material culture of the *Caraca,* ceramic vessels were not mentioned. However, these had to be at least used to cook the bitter manioc juice and in the preparation of manioc cakes, baked on the ceramic griddles.

The *Caraca* used yellow, golden, purple, black and red mineral and/or vegetable colourings. The last two were used to paint the human body. The body paintings were sometimes applied over a previously made base of resin called *orcay ymara* (Biord 1995: 144). This resin was obtained from the *carapita* tree (*Carapa guianensis)*, and there are still few modern localities called *Carapita* in the area of the Lake Valencia (Botello 1990: 36).

In the battles the *Caraca* used different musical and signal instruments including drums and aerophones, such as the shell trumpets (*caracoles*) and *fotutos*, long flutes made out of canes, like those that were used by the Carib speakers from the Middle Orinoco River (Gilij 1965[1782], vol.2: 228-9; Carrocera 1968 vol.3: 438).

Socio-political organisation

According to Pimentel (1964[1578]) the *Caraca* Indians lived in small multi-house villages inhabited by closely related extended families and, probably, a certain number of non-consanguineous co-residents (for a pertinent example of *Ye'kuana* households see Heinen 1983-4). Exceptionally, the villages would have been bigger (Pimentel 1964[1578]: 118). These bigger villages, contrary as among other Caribs (Dreyfus 1983-4: 43), were probably not those whose leaders were a renowned war chiefs, but rather a skilful 'aggrandizers' (see Rivière 1995: 191; Hayden 1995). The village of *Guaicaipuro*, the main war chief of all confederated *Caraca* Indians, was clearly not a big village (Oviedo y Baños 1982[1723]). The villages can ideally be considered as economically almost self-sufficient units. However, they were obviously not self-sufficient demographically, as well as depended socially on other similar units not only for the social reproduction of themselves but also for the reproduction of a bigger unit.

The data suggest that clusters of small kin related villages formed mayor territorial units interconnected by strong social and ideological linkages, as well as by a common dialect. Since the social-political organisation of the *Caraca* was structured through kin relations, so the economic inter-household and, probably, inter-communal links were arranged into chains of reciprocity derived from them, as in many other Carib-speaking societies (Butt Colson and Heinen 1983-4). Whether or not this larger political units encompassed a homogenous ethnic groups is not possible to determine on the basis of the available ethnohistoric data (see Biord 1995: 206).

I suggest, that on the regional level of social-political integration, all *Caraca* groups could participate in the network of mutual dependence related to trade, marriage, ceremonial co-operation, shamanic services exchange and war alliances (see Villalón 1983-4 for an example of *E'ñapa* [*Panare*] regional interactions). Moreover, it seems that the Carib political integration, through links of diverse nature and intensity, can even be tracked on an inter-regional scale. Biord (1995) suggested that the socio-political structure of the *Caraca*, as it can be inferred from the Pimentel and Oviedo y Baños sources, was very similar to the model of social structure proposed by Morales Méndez and Arvelo Jiménez (1981) for Carib-speaking societies of the inter-ethnic system of the Orinoco River Basin and its contiguous areas. It has been suggested that the Amerindian societies from the Orinoco Basin participated in a system of inter-ethnic dependency (Arvelo-Jiménez and Biord 1994), and that the groups from the eastern and central Venezuelan coast could have also been integrated into such system (Biord 1995: 180). It should be clearly stated, however, that not only Carib-speakers participated in these interregional spheres of interaction (Dreyfus 1983-4). Brizuela (1957[1655]) clearly stated that the Carib speakers from the eastern coast (*Cumanagoto* and their neighbours) 'have a communication and trade [...] with these from the inland that live toward the plains [*llanos*] and these [inhabitants of the *llanos* have a communication] with the Caribs and the other nations that live on the Orinoco River' (see also Civrieux 1980: 166-172). The alliances shifted frequently and in result the Carib speakers often confronted other Carib speakers on the battle theatre (see Da Prato 1981).

Returning to the *Caraca*, their smaller residential unit or household was the basic arena for production and consumption (see Wilk 1991), as well as for a wide range of activities not all of which were strictly economic. Each household had its headman and every village had its own leader. The prestige of a leader stemmed mainly from the agricultural productivity of his household. I suggest however, that like among other Caribs, his abilities in oratory, knowledge of the historical tradition of the villagers, skills in the management of social relationships and/or ritual skills, must probably have been superior to other households headmen of the village (see Civrieux 1980: 141 for the *Cumanagoto*). The leader of the *Caraca* village was closely assisted by the shaman (*piache*) and his power was limited by the existence of councils composed of the elder man. During peace time the leader had neither authority nor coercive power beyond his own village (Biord 1995: 207).

However, the political organisation of the *Caraca* was decentralised only during the peace time. In war time, it could change radically, when one chief could assume the command of confederated warriors, forming wide intercommunal or regional alliances. The rise of *Guaicaipuro* as the 'main chief 'of the confederated *Caraca* Indians in 1568, occurred when the Spaniards threatened the existence of all inhabitants of the region. However, even in such exceptional conditions the authority of *Guaicaipuro* was not based on coercive power but on verbal persuasion (Biord 1995: 208). The meetings of several chiefs dedicated to the discussion of war strategies (war councils) were associated with intense shamanistic ritual activities (Oviedo y Baños 1982[1723]).

In résumé, the members of the *Caraca* societies could achieve social status in three different ways. Perhaps not accidentally, Pimentel (1964[1578]) began to enumerate them with the shaman at the top of the status ladder. Shaman, as a 'man of power' and a 'man of prestige' (Dreyfus 1983-4: 46) could, undoubtedly, achieve a great power that could transcend the communal, or even regional, borders (see Civrieux 1980: 141; Reichel-Dolmatoff 1986: 136). It should be stressed that old women could, exceptionally, be shamans in *Caraca* societies (Oviedo y Baños 1982[1723]: 541). Below the highest-ranked shaman was a leader of a group of kin-related households, or a village, who had to be a:

> good farmer and [the person] who organises many *borracheras* and who has many women, daughters, and sons and daughters-in-law. From these comes any good [kin] relation, and they obey him as their major relative (Pimentel 1964[1578]: 125).

The sources give no data regarding the inheritance of the status of leaders; however, the Carib speakers from the eastern coast used to inherit this status even though lineage was not the only requirement to achieve the status of leader (Civrieux 1980: 144). I suggest that even though the *Caraca* leaders status was not hereditary although the sons could probably succeeded their fathers with the agreement of the community.

The third way to achieve social status in *Caraca* societies was through exceptional valour and bravery. Pimentel seems to suggest that special rites were performed for those warriors who killed enemies in the battle. These warriors were ranked according to their achievements in the battles and received a new name after each killed enemy, as well as a respective number of crowns or feathers (Pimentel 1964[1578]: 125).

The data clearly indicate that a dual system of leadership existed among the *Caraca.* During peace time, a community leader was the one among the headmen of households who more generously redistributed a major quantities of wealth such a foodstuffs and beverages. In times of war, the highly ranked military chief, centralised authority in his hands. The chief, as well as the highly ranked warriors, were easily recognisable by gold ornaments, animal skins, feather crowns and probably specific body paintings, that were unmistakably inherent to their status. The social-political mechanisms involved in the processes of centralisation and decentralisation of authority remain unknown for *Caraca* societies (see Oliver 1989: 290-294 for similar processes among the *Caquetio*).

Biord (1995: 148, 193), basing on Pimentel's and Oviedo y Baños's data, noted that the *Caraca* were not stratified societies with not corporate groups, and in consequence, they can be considered as egalitarian societies. The examples of co-operation and liberal communitarism of labour among *Caraca* described by Pimentel, as well as those among the *Cumanagoto* (the Carib-speakers to the east), as discussed by Civrieux (1980: 150-152), tend to confirm the egalitarianism of the 16th century Coastal Caribs. The quasi egalitarian social relations among other historic Carib societies have been convincingly presented by many scholars (Butt Colson and Heinen 1983-4). However, I consider that both Pimentel's and Oviedo y Baños's chronicles contain specific data that may suggest that certain *Caraca* groups could be seen as transegalitarian rather than truly egalitarian societies, the existence of which, in human social evolution, has been questioned by many scholars (see Hayden 1995; Feinman 1995).

Between equality and inequality

Especially important data that seem to indicate the existence of certain socio-economic inequalities among the *Caraca* come from Pimentel's description of their mortuary practices. He distinguished and described sharply different mortuary rituals and practices that were applied to the deceased shamans and 'well [kin] related' individuals on the one hand, and to the rest of the members of the societies, on the other hand (Pimentel 1964[1578]). Since Pimentel did not mention the funerals of the leaders, then I suggest that these 'well related' individuals were, probably, the village leaders. The social position of these individuals resembles the Melanesian 'Big Man' institution (Sahlins 1963) and the presence of a 'Big Man' type of leadership has been suggested by Dreyfus (1983-4) for the *Kaliña* and *Kalinango* Carib-speakers and, later, discussed by Oliver (1989) for the Barquisimeto *Caquetios*. The qualitative analysis of this resemblance, with all the cautions against the stereotyping (see Oliver 1989: 291), needs deeper levels of analysis that go beyond the goals of the present thesis.

Pimentel noted that the *Caraca* knew the institutions of marriage and divorce and practised polygamy. He noted, that a man could have as many women as he could sustain; however, 'if the husband is not a good farmer' the wife would leave him easily (Pimentel 1964[1578]): 124). If the husband was 'producing' much less foodstuffs than others then he could not attract and sustain enough women to have numerous offspring and, in consequence, a big household under his control. The social prestige of the village leader and of his household, as well as the number of its members, were directly tied to its productivity and *vice versa*. Pimentel added that the men aimed to have a great number of dependent members of family, especially numerous sons and daughters-in law. The vital role of marriage to both the economy and the continuity of power through alliance structures has been stressed for the many Carib societies (Rivière 1983-4: 357). Being a member of a household of one of these affluent and 'well related' men could be the aspiration of other household members what, in consequence, would have been conducing to the parent-arranged marriages, promoted enhancing the socio-economical inequities between the *Caraca* households, and induced the origination of few high-status households (see Arnold 1995: 97; Blanton 1995). It can be inferred from the Pimentel's data, that certain household headmen could so successfully manage the family members, who obeyed them, that they could amass a surplus of production that permitted them to give feasts, called pejoratively *borracheras* by Pimentel. These displays were undoubtedly oriented to attract more dependent sons and daughters-in-law, to strengthen alliances and to raise the social status of the 'well related men' within and beyond the community (see Dreyfus 1983-4: 43-44). In this stage of discussion the resemblance of these successful aggrandizers with a 'Big Man' comes into mind. However, the deficient ethnohistoric data constrains the analysis of possible social-economic inequity among the *Caraca,* especially their inland groups. Given these constraints, it seem reasonable to conclude, for now, that the *Caraca* leaders to retain their authority and alliances, they could not retain economic wealth but should redistribute it back to the community, during the communal feasts (see Oliver 1989: 291).

Warfare

One aspect of the *Caraca* societies that is somewhat hidden in Pimentel's *Relación*, refers to their inter-group animosities and warfare. Pimentel attributed the fall in aboriginal population of north-central Venezuela not only to the effects of the Conquest, but also to 'the weariness [*desasosiego*] of their past wars' (Pimentel 1964[1578]: 118). The warlike character of the *Caraca* Indians was not exceptional, but should be seen as a rather common feature of many of their neighbours (not only Caribs) to the east (Civrieux 1980) and to the south-west (Oliver 1989: 227; Arvelo 1995; Rivas 1989; see also Redmond 1994a; 1994b). Civrieux (1980: 172) suggested that the warfare among the contemporary *Yanomamö* Indians groups can be viewed as the last vestige of the pattern of prehispanic warfare in other parts of Venezuela.

Other ethnohistoric data can also suggest the warlike character of the *Caraca* Indians; the already mentioned poisoned sharp stakes that were interred at the entrances to the cultivated fields would have been directed not only against the animals that were disturbing the crops, but also against humans. Pimentel (1964[1578]: 125) added that the same stakes were placed on certain roads or tracks and near the houses. Oviedo y Baños confirmed the defensive use of poisoned stakes in the region. Moreover, he mentioned that during the pacification of the region undertaken by Diego de Losada in 1568, he found a series of villages (*pueblos*) he called *Estaqueros* 'because of the great quantity of poisoned stakes and spines which were sprinkled in the tracks [of this area]' (Oviedo y Baños 1982[1723] vol.2: 446). In these villages Losada found clear evidence of cannibalistic practices. Even though these poisoned 'spines' and stakes are not descriptions of palisades *sensu stricto*, it is known from the ethnohistoric sources that villages fenced by palisades were common between the Carib-speaking *Palenques* from the region of Unare River, to the east (Acosta Saignes 1946: 31; Civrieux 1980).

If the cultivated fields were equally or even better protected against humans than the villages were. This can indicate that there were a competence for foodstuffs and good cultivated fields among the inland *Caraca*. I presume that some of the reasons of intergrupal war among the *Caraca* were (1) access to the best areas for agricultural purposes and (2) the capture of prisoners for the cannibalistic practices by certain groups. Warfare due to the pressure on the agricultural space has been reported by Oliver (1989: 292) for Barquisimeto *Caquetío* Indians.

Oviedo y Baños's (1982[1723]) data confirmed the intergrupal wars among the *Caraca*. However, he also added a new possible explanation of the warlike character of the *Caraca* Indians, as well as for their use of the defensive gear. He informs us that fierce Carib raiders (*Kalinago/Kaliña*) periodically assaulted the Indians of north-central Venezuela in search of slaves (Oviedo y Baños (1982[1723] vol. 2: 547; see Dreyfus 1983-4; Da Prato 1981). The nature of these raids will be discussed later in this section. However, it is impossible to infer from the ethnohistoric data whether the coastal *Caraca* were themselves engaged in raiding expeditions, whether or not they owned slaves. They are instead portrayed as people victimised by the 'cannibals' attacking from the east and north-east, but that may be at the time of the chronicles only.

The *Caraca*, like their Carib neighbours to the east, could count on intercommunal support in the case of war. It was demonstrated that the historic Carib societies implemented the strategy of marriage alliances between various villages that created the compromises of mutual help and were activated in wartime (Civrieux 1980: 173). It should be stressed that the political importance of marriage was not only the characteristic of Carib societies from the coastal Venezuela. As Oliver (1989: 281) noted, according to the ethnohistoric sources, the chief *Manaure*, who was a supreme authority of the Arawakan *Caquetío* chiefdom, to the west of *Caraca* (the State of Falcón), was married to 'daughters of the Caribs', in order to gain prestige and influence beyond his own ethnic and political boundaries, as well as to gain allies who support him in a case of war threat.

Trade

We know very little about the trade of the *Caraca* Indians; however, it can be expected that it was based on the principles of reciprocity. The gold objects must have reached the *Caraca* from outside their territory, since they were not a local production. These rare adornments may be considered as indicators of status and/or wealth inequities among families within the same community and among individuals within the same household. Unfortunately we know nothing about the symbolic value attached to these objects and their relation to the social status of their owners. Other imported items would have been the medicinal plants, rare feathers for the splendid head-dresses often mentioned by the ethnohistorians, and the arrow poison or *curare* (for discussion of possible *curare* trade among Caribs see Civrieux 1980: 210-11).

Biord (1995: 89) demonstrated that hammocks would have been the most valuable exchange items produced by the *Caraca* for exportation beyond their regional boundaries. Other exportation items could have been cotton material and blankets, baskets, maize, *casabe* (manioc cakes), honey, black wax and natural colorants. It is also possible that *coca* (*Erythroxylum* sp.) leaves may have been traded to the eastern groups (Civrieux 1980). Regarding the internal trade between the *Caraca* societies, Pimentel stressed that such marine products as salt, fish and, without a doubt, oil extracted from the marine turtle, were exchanged for vegetables and fruits from the interior:

> these [inhabitants] from the interior go with the edible goods to the sea [shore] to buy them and to exchange the salt and the fish for what they bring [with them] (Pimentel 1964[1723]: 119).

The data suggest the existence of a rather regular exchange of goods between the inhabitants of two sharply different ecological systems: the coast and the interior mountains and valleys. This type of exchange between Amerindian societies from the coast and inland has been documented for almost all the Venezuelan coast from Lake Maracaibo (Sanoja 1969) to the east, to the eastern coast (Civrieux 1980). Obviously, this exchange could allow certain individuals and/or higher-status households to maintain wide regional contacts while other were only participating in local exchange. By restricting the circulation of prestige goods the high-status households or individuals (leaders) could emerge or enlarge the socio-economic inequalities within the *Caraca* societies. Whether such a situation really took place within *Caraca* territory or not, should be possible to establish by means of archaeology.

Coastal versus inland *Caraca* societies

The ethnohistoric sources do not directly mention the existence of marginal communities in the region, nor marginalization of groups or individuals. They do mention 'bigger' villages as well as 'the most important leaders' among the *Caraca*. Oviedo y Baños (1982[1723]: vol.1: 222) clearly stated that *Naiguatá* was 'the most powerful leader [señor] that inhabited all these [central] coasts'. The sources seem to indicate that the *Caraca* were rather a people victimised by the raids organised by the island *Kalinago* and mainland *Kaliña Caribs* from the east. If *Naiguatá* was not a prominent warrior as the *Kaliña/Kalinago* leaders were (Dreyfus 1983-4: 47), why then was he considered the most prestigious leader of all the coast? Would this leadership have evolved under the conditions of surpluses in subsistence resources? If so, the difference in the size between the village of *Naiguatá* and other coastal villages should have been considerable and archaeologically recoverable, since the size of the settlement and the number of its inhabitants can be considered indicative of the status and quality of its leader (see Rivière 1995). The role of potentially unrestricted participation in socio-political, as well as economical and ideological affairs across wide territories, facilitated by open sea navigation, should also not be underestimated while searching for the origins of the power of the *Naiguatá* chief. In conditions of a surplus of resources, certain extended families or large co-operative households on the coast may have been organised into residential corporate groups. Can this inference suggest, that certain coastal societies may have shifted toward a greater social inequality and complexity then their inland counterparts?

Wide networks of socio-political linkages could be extended out from the *Naiguatá* village; certain leaders who lived along the coast recognised his power and were, probably, his kin relatives (Oviedo y Baños 1982[1723]). Intuitively, the label of a 'Big Man' seem to fit better to the figure of *Naiguatá* than to his inland counterparts. It can also be inferred from the same source that these kin relations would have been extended as far as Margarita Island, to the east, cross-cutting the probable ethnic barriers between the *Caraca* groups from the coast and the *Guaiquerí* Indians, who inhabited that Island. Can it suggest, that the coastal *Guaiquerí* leaders formed a kind of 'oligarchy' that ruled the several villages scattered along the central and central-western coast, recognising the major authority of *Naiguatá*? Was *Naiguatá* a leader of the biggest village on the coast, being a wealthy fishermen, a successful trader and/or a renowned war raider? Can his authority be also related to the phenomenology of the landscape that bordered his village from the south? The peak of *Naiguatá* (nearly 2800 masl) is the highest mountain not only on the central but on all the Venezuelan coast.

Pimentel referred that:

> the aborigines [from the coast] go there [to Los Roques, Las Aves and La Orchila islands] during the months of fair weather for salt and for the turtles to eat them and to make oil from them (Pimentel 1964[1578]: 136).

The navigation to, and exploitation of, the resources located on the offshore islands could demand supra-household co-operation. Even though the pertinent Oviedo y Baños's data are very scanty, I will hypothesise that certain originally self-sufficient households would have been aggregated into a house-group clustered around the most successful leader and his household, in order to control and exploit more efficiently the highly productive resources of the sea, and to take advantage of the high demand for them among the interior societies. There is no ethnohistoric evidence referring to the existence of communal or individual rights over the resources on the central coast. However, such a reference does exist for the *Caraca* Carib-speaking neighbours to the east. Among the *Palenque* from Unare River, the infringement of hunting and fishing spots was a common reason for the outbreak of war (Castellanos 1962[1589]). The house-groups would, through time, be manipulated by a 'Big Man' into more surplus-oriented units that controlled (1) information about the location of fishing grounds, salt pans and shell beds, as well as the knowledge of navigation in the open sea, (2) the production of the seagoing canoes that enabled access to these distant resources and, (3) the processes of exploitation, including both the production and operation of fishing gear (large nets, traps, special technologies to dry the meat and collect the salt), as well as the ability to manage the specialised work groups. Furthermore, these kin related house-groups could become ranked relative to one another (see Arnold 1995: 97), and finally they could cluster into larger kin-related corporate groups under the main leader of a 'Big Man' type.

I suggest that the corporate control of subsistence resources could evolve only on the coast, while the resources of the interior hills and valleys were under the control of autonomous families. I further propose, that the coastal societies based their economies on the appropriation of the resources from both marine (fishing/gathering) and terrestrial (hunting/gathering) environments and, additionally on the slash and burn agriculture practised on the slopes of the Cordillera. Pimentel (1964[1578]) clearly indicates that the inhabitants of the interior used to go to the coast in search of marine products but not *vice versa*. In consequence, there could exist certain differences in social organisation, power and wealth between the *Caraca* groups of the coast and of the interior. Were the coastal societies economically self-sufficient, more complex socially and wider connected politically than their interior counterparts?

It is necessary to stress that the above discussion refers only to the area of the central and central-eastern part of the coast and the adjacent Valleys of Caracas and Tuy. Moving to the west, toward the Valencia Basin and its adjacent coast, the ethnohistoric data are even scarcer and cannot be used to make similar inferences. Because some archaeologists have suggested that the Valencia Basin was the only area in all the north-central Venezuela where non-egalitarian prehispanic societies evolved (Sanoja and Vargas 1974; Vargas 1991), it will be necessary to establish the cultural and linguistic links between this area and the rest of the Province of Caracas at the time of the Spanish conquest.

The Province of Caracas and the Valencia Basin

The inclusion of the Valencia Basin in the Province of Caracas, according to geographical criteria, as well as the cultural and linguistic characteristics of its aborigines, is a matter of controversy, due to the scarcity of pertinent ethnohistoric information. However, to enable further articulation between (1) the Amerindian societies encountered by Spaniards in the Valencia Basin, (2) the prehistoric moundbuilders of the lake's shores and (3) these who exploited the offshore islands, it is necessary to deepen this matter.

The *Laguna de Tacarigua*, the originally name for Lake Valencia and its valley, was not included within the boundaries of the Province of Caracas, as this was described by Pimentel (1964[1578]). Moreover, when Pimentel was enumerating the natural freshwater reservoirs within the Province and its fishing resources, he did not mention Lake Valencia (Biord 1995: 116, 139) which is, by far, the biggest freshwater reservoir in all north-central Venezuela. However, the Valencia Basin could not have been simply overlooked by Pimentel, in the late 1570s. It is noteworthy that Juan de Villegas formally took possession of the *Laguna de Tacarigua* in 1547; in 1555 the city of Valencia was founded and its inhabitants supported economically the conquest of the valley of Caracas (Oviedo y Baños (1982[1723]).

In consequence, it can be suggested that rather than being a mistake or an oversight made by the royal official in an formal document, the *Relación* of Pimentel reflects the actual geographical separation of the Valencia Basin from the rest of the Province of Caracas. Crossing the mountains between the valleys of Caracas and Aragua must have been a hard venture in those times. Even in the 1800s, travellers between these two regions preferred to embark in La Guaira port and navigate along the coast to Puerto Cabello, rather than cross the mountains directly (Humboldt 1956[1814-1825]).

Shifting from geographical to cultural aspects, the question arises: did the geographical separation of these two regions also correlate with cultural/linguistic differences of their respective aboriginal populations?

Pimentel noted that the villages of the *Caraca* were spread to a maximum distance of 12 leagues or 67 km from Caracas (according to Biord 1995: 201, one league = 5.572 km). The question arises whether Pimentel referred to a straight line (as a 'crow flies') measurement, or to a length of a mountainous pedestrian track. The distance between Caracas and the area of the artificial prehispanic mounds, located near the modern village of Palo Negro, comes to approximately 80 km in straight line. This figure rises considerably when converting the straight line distance into the true travel distance through sinuous mountain tracks. Comparatively, the distance by modern motorway between Caracas and Maracay city, located on the north-eastern shore of the lake, is 109 km (Mapa de carreteras de Venezuela 1980); the prehispanic route was probably longer than the length of modern motorway that incorporates several bridges and tunnels. In consequence, I suggest that Pimentel used a straight line measurement; other data from the same *Relación* seem to confirm this hypothesis. When he described the extension of the Province, the distance of 35 leagues (195 km) between Cabo Codera and Borburata, as well as the distance of 25 leagues (135 km) 'from the sea to the plains' (Pimentel 1964[1578]: 113) are surprisingly exact straight line measurements. If my hypothesis is correct then the Amerindian populations located to the eastern shores of Lake Valencia were included by Pimentel within the *Caraca* territory.

Unfortunately, there is an intriguing, almost complete, lack of ethnohistoric data and of early documents (referred to assignments or *repartimientos*) regarding the Amerindian populations inhabiting the shores of Lake Valencia at the time of the Conquest. As a result, the first half of sixteenth century can be still considered as a proto-historic period in the Valencia Basin; the Europeans seriously affected the aboriginal population, but the overall process remained totally unrecorded.

Before the Spaniards entered into the Basin, they were informed about the abundance of Indians living around the lake's shores, and this was one of the most powerful incentives to conquer this area

(Castellanos 1962[1589]; Oviedo y Baños 1982[1723] vol. 1: 218). These early information, however, do not match with the scarcity of information produced once the Spaniards entered and established themselves in this region. The document about the formal act of possession of the lake for the Spanish crown by Juan de Villegas, in 1547, did not include any reference to the native inhabitants of the Lake Valencia shores. Eight years later, when Alonso Díaz entered the area to found the city of Valencia, he encountered a certain resistance by the Amerindian inhabitants; however, they were easily defeated (Oviedo y Baños 1982[1723], vol. 1: 219), which may imply that they were not numerous, and still not confederated with other neighbouring groups to the east.

Castillo Lara (1977) suggested that the absence of the sixteenth century data regarding the Amerindian inhabitants of the region may be the result of: (1) the scarcity of local population at the moment of Spanish arrival, (2) the early slavery actions taken by the Conquerors, (3) the results of the epidemics, and (4) the loss of pertinent original documents. I agree with Lara that such factors as slave raids and epidemics must have lowered the local Amerindian population. However, if we exclude the possible loss of Spanish documents and accept that in the second half of the 16th century the native population of Valencia Basin was extremely sparse, factors other than epidemics and slave raids have to be taken into consideration to explain why the precontact information emphasised a high regional demography.

In particular the Spanish slave raids would not have had the same disastrous effects on the Valencia Basin Indians, protected by the Cordillera de la Costa, as they would upon the inhabitants of the coast who were 'open' to any attack from the sea. According to Castellanos (1962[1589]: 61) the Spanish raiders who searched for slaves for the pearl fisheries on Cubagua Island, did not penetrate for more than 2-3 days of walk from the coast; they feared not only the Indians, but above all the lack of security when away from their boats. Even though the Spaniards could reach Lake Valencia by a 2-3 day expedition from the coast near Puerto Cabello, from the data presented by Civrieux (1980: 56-58) it can be inferred that the eastern coast, between Maracapana, Unare and Píritu, was the more heavily raided area. The raiders reached the western coast of *Curiana* (Falcón State) frequently; however, the eastern coast presented more opportunities for these cruel actions since it was, by these early decades of the 16th century, disregarded by the Spanish leaders of the Province of Venezuela, who directed their 'golden' interest toward the Reino de Santa Marta. It is also noteworthy that, even though Spaniards took slaves in the Valencia Basin, this does not imply they did not get lots of data on the basin inhabitants, that would have been utilized by the chroniclers and other writers of that epoch.

I suggest that the early accounts of the numerous aboriginal population of the Valencia Basin could have been largely overestimated or erroneous. Since these estimations were based on indirect data provided by the Amerindian informants, it is possible that the Conquerors may have heard precisely what they wanted to hear: good news about rich and densely populated lands, providing them with justification and investment for conquering the region.

If, however, the original information was accurate, the aboriginal populations may have been dispersed beyond the Lake Valencia shores before the Spanish conquerors reached the region. It is noteworthy that the *Caraca* groups recognised their territorial boundaries and maintained oral histories about their origins. The *Toromaym(n)as* who, in the mid 16th century, inhabited the Valley of Caracas and the coast to the north, were probably newcomers to that area. According to their oral history, they were proceeding from the ancestral land called *toromayma* (Pimentel 1964[1578]). Even if we do not know the geographical location of the original *Toromaymas* homeland the question arises: Could a part of the inhabitants of the lake have resettled to the east before the Spaniards approached them from the west? I suggest that when approached by the Spaniards from the west, the population would have dispersed. Part of the population would have taken refuge on the islands of the lake and the rest would have escaped eastward, to the highlands, into the valleys of Tuy and Caracas, as well as toward the coast, to the north and north-east. The indigenous defensive strategy to retreat toward the lake's islands bringing their canoes with them, was observed when Ambrosio de Alfinger, in 1530, entered the Laguna de Tamalameque, in the eastern Colombia (Oviedo y Baños 1982[1723], vol.1: 27). The results of these cruel entrances of Alfinger to the indigenous villages located in north-western Venezuela and eastern Colombia, as well as the posterior expeditions of Federman and Espira, that penetrated closer to the Valencia Basin, were devastating for Amerindian societies (see Oliver 1989). It can be suggested that this 'bad news' had enough time to spread eastward, to reach and warn the Valencia Basin inhabitants. In consequence, when Spaniards approached the region, the Valencia Basin inhabitants were only shortly reported as living on the islands rather than on the lake's shores (Herrera y Tordesillas 1962[1601-1616]; Barbudo 1964[1570-1575]: 91; Castellanos 1962[1589]).

I further suggest that the slave raiding by warlike Caribs, described by the Spaniards as 'fierce cannibals', can not be ignored as a possible factor that pushed the aboriginal population of the Lake Valencia shores out of their homeland during the late prehistoric or early proto-historic times. Just between 1569 and 1583, these - raiders three times attacked the Province of Caracas. On one occasion more than 300 Caribs from Grenada Island navigated along the coast and attacked the Spanish village of Caraballeda, on the central coast. On two occasions the Caribs from the Guárico river, in the Orinoco River area, reached the southern shores of the Lake Valencia, and threatened the village (Oviedo y Baños 1982[1723], vol.2: 474; 553; 575). There is no doubt that these Carib raiders were a mortal threat to the aboriginal population of the Valencia Basin. In 1583, the chief *Querepana,* with 100 *Arbaco* warriors, accompanied conqueror Garci-González to pursue the Carib raiders southward, toward their settlements located on the banks of Guárico river. Oviedo y Baños (1982[1723], vol.2: 575) described these raids as periodic and linked to the capture of slaves due to their cannibalistic practices. However, it should be stressed that the *Caraca* have also been described by both Pimentel and Oviedo y Baños as practitioners of cannibalism. This theme awaits future studies oriented to disentangle genuine cultural practices from the phenomenon of cannibalism used as a European legal weapon to enslave and defeat the warlike Amerindian groups (see Whitehead 1988).

Pimentel (1964[1578]) mentioned the *Meregoto* and *Esmeregoto* as Amerindian groups living within the boundaries of the Province of Caracas, but gave no information about their geographical location. Oviedo y Baños (1982[1723] vol. 2: 359) reported that the *Meregoto* lived on the banks of the Aragua River, which flows into the eastern part of the Lake Valencia. In the 17th century the descendants of *Meregoto* Indians claimed their rights to the ancestral lands before the local colonial administrators; the lands that were claimed were the same as described by Oviedo y Baños (Morales Méndez 1994). While the Spaniards advanced toward north-central Venezuela, the *Meregoto* and/or *Esmeregoto* were the first integrated Amerindian groups encountered by them in the area to the east of Lake Valencia's shores.

There is no agreement between scholars concerning the language that could have been spoken by the aboriginal inhabitants of the Valencia Basin since the ethnohistoric sources provide no direct data about this matter (Loukotka 1968; Biord 1995). Pimentel (1964[1578]) included the *Meregoto* and *Esmeregoto* within the *Caraca* Indians and affirmed that all of them had spoken the same language. Two additional data seem to confirm this appreciation.

In 1559 Francisco Fajardo attempted for the third time to conquer the Province of Caracas from the east. Starting from the central coast, he crossed the Cordillera toward the Valencia Basin. He faced hostile *Arbacos* warriors, but he convinced their chief, *Terepaima*, in his own language, to lay down his arms and to assist him in his expedition (Oviedo y Baños 1982[1723] vol.1: 248). This information may suggest that even though the *Arbacos* were not reported as inhabitants of the lake's shores, they were Carib speakers and, Oviedo y Baños indicated that they were the closest neighbours of, and had good relationships with, the *Meregoto* Indians. In consequence, it can be inferred that the *Meregoto* and *Arbacos* could communicate among themselves, in the same language or a dialectical variation of it.

An Aragonese Capuchin, Fr. Francisco de Tauste, worked for 22 years in the mission among the *Chaima* Indians in eastern coastal Venezuela. In 1680, he remarked that the Carib language dominated in Eastern Venezuela (Henley 1985: 154) and claimed that it was intelligible to the Amerindians in the region, as far as the vicinity of the town of Valencia.

Civrieux (1980: 37, 38) considered the *Caraca, Teque* and *Meregoto* as north-western Carib dialects. He further suggested (Civrieux 1980: 40) that the westernmost Caribs such as *Caraca* and *Meregoto* could speak dialects of the *chotomaimu* language that was a common for the septentrional Caribs and well differentiated from the language *Kari'ña* spoken on the eastern plains (Llanos Orientales) of Guarapiche and in Guyana.

However, Antonio de Herrera y Tordesillas (1962[1601-1616]: 143) citing *La Relación de las Tierras y Provincias de la Gobernación de Venezuela* dated to 1546, mentioned that 'the Indians who inhabit a few islands that are in it [the *Laguna de Tacarigua*] trade the gold and cotton clothes, and they [the Indians] are near [in distance] to the Indians *Caracas*'. Castellanos (1962[1589]) added that the inhabitants of the lake's islands cultivated their fields there. Would this comments indicate that the inhabitants of the lake islands were culturally and linguistically different from the *Caraca* Indians? Were they also independent and different from them in socio-political and economic aspects?

The ethnohistoric sources narrate very little about the Amerindian populations of the seashore north of the Valencia Basin. Tracking down into the prehistory the genealogy of Doña Isabel, the women-chief of the *Guaiquerí* Indians from the Margarita Island, whose son, Francisco Fajardo, attempted between 1555 and 1564 to conquest the Province of Caracas, it could be established that her grandfather *Charayma*, the leader of the *Guaiquerí* Indians from the Maya bay, north-western coast (Oviedo y Baños 1982[1723]: vol.1: 220), was born about 1480. The brother of *Charayma* was a father of the historic chief *Naiguatá*, from the central coast, who was contacted by Fajardo in 1555/56 and who participated with his followers in the frustrated attack against the village of Caracas, carried out by all revolted *Caraca* 'nations', in 1568 (Oviedo y Baños 1982[1723] vol.1: 222; vol.2: 435). These data show that small enclaves of the *Guaiqueríes* lived on the central and central-western coast prior to the European Conquest, and that in the first decades of the 16th century this Indians were well embedded into the overall social and political system of the *Caraca* Indians.

In the late 16th and early 17th centuries small Amerindian groups lived scattered along the coastal bays and on the northern slopes of the Cordillera de la Costa. Earlier data, however, are very scarce. It was mentioned that, before 1547, the Spaniards thrown away the Indians who were exploiting the salt pans located near the Spanish village of Borburata, to the west (Vila 1953: 69). These Indians, according to the same source, supplied with the salt the inland located groups. This information may indicate that the prehispanic inhabitants of the Valencia Basin could obtain the salt from the Borburata pans instead of from La Tortuga island, where, according to Pimentel (1964[1578]), the *Caraca* Indians exploited the salt pans for the use of all native inhabitants of the Province of Caracas. The proto-historic lake island inhabitants could exchange gold and cotton materials for salt, and, possibly for other marine resources. This inference suggests that the inhabitants of the lake's islands maintained economical, and possibly also social and political, relationships with the Amerindians from the western portion of the central coast, instead of with their neighbours to the east.

In the light of the presently known documents, the *Meregoto* and/or *Esmeregoto* Indians were living around the eastern Lake Valencia shores at the time of the European Conquest. They were culturally related to the *Caraca* Indians to the east and spoke a Coastal Carib language/dialect. Certain Indian groups, possibly not related culturally and linguistically to the *Caraca* Indians, inhabited the islands of Lake Valencia. I suggest that these lake dwellers who maintained economic, and probably also social, political, and ideological relationships with the inhabitants of the western part of the central coast (the area of Puerto Cabello), could not participate directly in the sphere of interaction of the *Caraca* Indians to the east. However, as shown by Dreyfus (1983-4), the study of political linkages which in the 16th to the 18th century inter-connected the Carib Islands (the majority of Lesser Antilles) and the South American mainland coast shows that, especially on the continent, the linguistic, ethnic and political boundaries were never permanent. As a consequence, even though the inhabitants of the lake islands were embedded in relationships with the western part of the central coast, it does not imply they were not the *Caraca* Indians.

The scholars agree that the historic Carib speakers can be viewed not as a mosaic of atomised and individualistic groups, but rather as united by wide and diverse levels of integration (Henley et al. 1982; Butt Colson 1983-4; Villalón 1983-4; Dreyfus 1983-4; Biord 1995). These notions can be of a great value in the prehistoric studies of Carib societies. However, due to the general lack of consistent methodology in the analysis of historical sources, as well as deficiencies of archaeological data, attempts of trespassing the threshold between the prehistory and history in the Amerindia, are difficult and controversial intellectual exercises.

Problems for archaeological testing

The ethnohistoric data discussed above contain information of crucial importance for the reconstruction of proto-historic Amerindian societies of north-central Venezuela. It also raised many questions that can be only answered by proper correlation of proto-historic and late prehistoric evidence.

The first set of questions regards Valencia Basin problems. Were the proto-historic *Meregoto* the direct descendants and cultural heirs of the pre-Hispanic moundbuilders of the Lake Valencia shores? Who were the inhabitants of the lake islands in the early 16th century? What processes would have been responsible for the apparent spatial overlap of the territory of the *Caraca* Indians and the area where the Valencioid series related pottery have been found? What kinds of social-political articulations operated between the Amerindians of the Valencia Basin and the adjacent coast?

The only way to face these problems is by establishing the proper correlation between the scarce ethnohistoric data and archaeological evidence. Unfortunately, not a single Indo-Hispanic archaeological site has been systematically excavated in north-central Venezuela to enable a direct articulation between these corps of data. It should be emphasised that, to answer this first set of questions, I cannot cite much more archaeological data, regarding the archaeology of Valencia Basin and the adjacent coast, than my predecessors had. The archaeologists have suggested that during late prehistoric times (a.d. 900-1500) the social-political organisation of the Amerindian inhabitants of the

Valencia Basin evolved into a chiefdom (Sanoja and Vargas 1972; Vargas 1990; Molina 1985). They further argued that this chiefdom, in search of complementary foodstuffs to feed its rising population, expanded out of the Basin, colonising and/or subjugating the egalitarian societies that inhabited the coast and the eastern part of the north-central Venezuela. However, this 'expansionist model' did not articulate the late prehistoric archaeological evidence with the early ethnohistoric data, to explain why only egalitarian and/or transegalitarian societies were encountered by the Spanish Conquerors in the region, in the mid 16th century?

To overcome the limitations of my predecessors, I propose to invert the traditional core-periphery oriented perspective and to gain insight into the core by looking at it from the coast and, especially, from the offshore islands. I suggest that the coast could be viewed as a highly coveted land not only for its economic resources but also, and perhaps above all, as a point of departure towards the apparently unrestricted supra-regional contacts. These contacts, enabled by open sea navigation, were the potential sources of exotic items, as well as the new stimulus and information, that would all have been necessary to strengthen and legitimise the power of the emerging elite from the interior. On the other hand, it is also necessary to take into account the historical developments of the coastal societies as participants in a network of different social, economic, political and ritual interactions that linked all the societies of the region. The coastal societies were able to negotiate their status with the inland neighbours or relatives, and were not simply a peaceful people victimised by the power of the Valencia Basin polity, as suggested by the model generally in vogue.

As stated by Vargas (1990: 123), the hypotheses about the rise and spatial spread of the purported Valencioid chiefdom were drawn from the archaeological data recovered on the Lake Valencia shores in 1930's (Kidder 1944; Berry 1939; Bennett 1937; Osgood 1943), and during the following two decades in the adjacent valleys and seashore (Cruxent and Rouse 1958; Rouse and Cruxent 1963). These early empirical studies were designed to construct spatial/chronological charts of the regional cultures. Until the present, the non-ceramic artefacts, as well as the environmental and contextual data, have been almost completely neglected in the archaeology of north-central Venezuela. The data gathered to fulfil the needs of 'artefact oriented studies' hardly constraints on any attempt to construct high level theories, including adaptationalism, evolutionary ecology and structural Marxism (Stanish 1992; Preucel and Hodder 1996: 9). However, in the archaeology of central-north Venezuela, as in many other lowland regions of South America where 'adequate data on settlement patterns, population size, crop regimes, agricultural productivity, [and] carrying capacity' are lacking, it is difficult to identify cultural or economic stress from the archaeological evidence, other than by impressionistic observations (Bray 1995: 97). Consequently, my intention is not to criticise the explanatory approach applied thus far to the prehistory of the north-central Venezuela, nor to enumerate its weaknesses derived from obvious limitations of the data base. I propose, instead, to gain an alternative insight into the mechanisms and patterns of the social-political and economical articulations that may have existed between the interior, coast and island populations in the light of the late prehistoric archaeological evidence from the offshore islands, because here we do have the relevant data to adequately address these questions.

According to Pimentel's *Relación* these islands were still visited and their resources exploited by the *Caraca* Indians in the time of the European Conquest. Were these visits only an episode temporarily restricted to the proto-historic period or, were instead a continuation of a long-term prehispanic tradition? Were the Amerindian inhabitants of the eastern and western parts of the central coast engaged in this enterprise? Did the Amerindians establish any permanent settlement on these islands, or only a temporary campsites? Were these resources spatially concentrated and temporarily predictable or rather sparse and available unevenly? What was their nutritional, economic and symbolic value for the Amerindian societies? What would have been the motives for such a enterprise far away from the homeland? Could these resources and their exploitation produce any important social-political and ideological consequences for the coastal, as well as the interior, societies?

Part Two

On the islands

Chapter Five

The islands

The islands, situated off the Venezuelan Caribbean coast, are classified within the Leeward Antilles while the Windward Islands are those located between Trinidad and the Virgin Islands (Blume 1974; Parry and Sherlock 1976 [Figure 1]). The majority of the Leeward Islands are calcareous formations while the Windward are predominantly volcanic islands (Stock 1982). The Leeward islands are located within an arid belt stretching along the southern Caribbean and the northern part of South America (Trewartha 1961: 57-64; Lahey 1973; Schubert 1974). The most important non-calcareous groups within the Venezuelan Leeward islands are Los Testigos, Los Monjes, Los Frailes and the Margarita, which is only in part, a calcareous island. The Archipelagos Las Aves, Los Roques and La Orchila, the islands La Tortuga, La Blanquilla and Los Hermanos, as well as the Dutch islands Aruba, Curaçao and Bonaire are largely calcareous formations, considered as an independent part of Antillean orogenesis (Weyl 1966 in Stock 1982:193). It has been suggested that this whole insular region 'may be a crustal block (Bonaire block), wedged and rotated between the Caribbean and South American plates' (Silver et al. 1975 in Schubert and Valastro 1976). The igneous-metamorphic complex which outcrops on these Venezuelan islands is probably of Cretaceous and Upper Cretaceous age (Schubert and Moticska 1972; 1973). These islands are separated from the mainland by channels several hundred meters deep and by a distances of dozens of kilometres (see Schubert and Valastro 1976). In consequence, they can be considered as oceanic type islands since they have never been connected to the continent by land bridges. From the biogeographic point of view the biota of these islands, emerging from deep waters, is composed of species settled by means of a long distance transoceanic dispersion, as well as by man (Pielou 1979: 191).

In 1871, the Venezuelan Caribbean islands were grouped administratively in *Territorio Colón* and in 1938, under the present label of Federal Dependencies. There is no agreement about the total surface of the Federal Dependencies, and the estimates range from 120 km² (Casanovas 1987: 13) through 175 km² (Vila 1967: 13) to 260 km² (Williams Trujillo 1980: 15). The islands of Coche, Cubagua and Margarita, included in the Nueva Esparta State are not a part of Federal Dependencies (Casanovas 1987); these three islands are excluded from the present Research Project.

In the early 20th century the fishermen from Margarita Island came to settle these islands temporarily, merging with a scarce population of Dutch settlers from Curaçao and Bonaire. The majority of these islands are presently uninhabited; there is only one permanent settlement in Gran Roque Island. In 1987, 807 persons lived Los Roques Archipelago: 586 resided in Gran Roque Island and 221 were temporary fishermen from Margarita Island (Amend et al. 1992: 9). In La Orchila there is a Venezuelan military base, and a Marine Coast Guard station is located in Ave Grande Island (Aves de Sotavento). On a few islands, including La Tortuga, there are temporary fishermen huts (*rancherías*) (see Jam and Schön 1956; Amend et al. 1992). Los Roques Archipelago was instituted as a National Park in 1972.

The geographic focus of this dissertation is on the Archipelagos of Las Aves de Sotavento, Las Aves de Barlovento and Los Roques, and on the groups of La Orchila and La Tortuga islands. The Los Roques Archipelago with its emerged and submerged area covers ca. 1500 km² (Méndez Baamonde 1977; 1978) and is a major geographic feature within this chain of islands. It also shares the main geological, climatic and ecological aspects with Las Aves and La Orchila Island groups. The La Tortuga is the largest among all these islands. It is located close to the mainland and has slightly different environment, topography and climate than the islands more distant from the continent.

Los Roques Archipelago

Los Roques Archipelago is located more than 135 km in a straight line to the north of the central Venezuelan coast, between 11° 44' 45' and 11° 58' 36' N and 66° 32' 42' and 66° 52' 27' W (Figure 24). From east to west the Archipelago measures 36.6 km, and from south to north 24.6 km (Williams Trujillo 1980). It is a complex of coral reefs and calcareous sediments established on a submarine platform of igneous-metamorphic rocks. The sediments are composed of 99% aragonite and calcite from disintegrated corals and reef-associated organisms. The soils are sandy, characterised by a low capacity to retain humidity and low content of organic material except in the areas of mangroves (Medina 1956). In consequence, they are unsuitable for agricultural purposes.

The peaks of the rocky basement of the Archipelago emerge on Gran Roque Island only, in the form of a chain of hills up to 120 masl (Vila 1967). The geological history of Gran Roque Island and its rocks were studied by Bergt (Sievers 1898 in Schubert and Wagner 1971), Rutten (1931), Rost (1938), Aguerrevere and López (1938), Bowen (1964); Schubert and Moticska (1972), Sonnenfeld (1973), Goddard (1974); Sonnenfeld and Hudec (1974), and Méndez Baamonde (1977), among others. These igneous-metamorphic rocks date to the Cretaceous (for metamorphic rocks) and Upper Cretaceous (for the igneous intrusions [Schubert and Moticska 1973; Méndez Baamonde 1978]). They emerged during the Early Quaternary and the first coral communities evolved during the Sangamon interglacial stage (Méndez Baamonde 1977). The formative processes of Los Roques reefs dated to 15,000 to 10,000 years ago and were stimulated by such favourable marine conditions as low sedimentation, high illumination, temperatures above 20°C, as well as adequate salinity and marine currents (Smith 1948; see also González 1989).

To the east and south the submarine platform falls abruptly to 1000 m depth (Méndez Baamonde 1977); this led to the consideration of Los Roques as one oceanic island without internal geographical divisions (Stock 1982: 194). Two long barrier reefs: the eastern with a length of ca. 20 km (*Cabecera de Los Roques*) and the southern, 12 km long (Cayo Sal), are oriented as a wedge against the currents flowing to the west. Protected behind the reefs, there evolved almost 50 cays and small islands disposed around a great inner lagoon of ca. 400 km^2 and one to eight meters in depth.

The islands are low, dominated by plains covered by grasses and other xeric plants. The major concentration of mangroves is located toward the south-eastern part of the Archipelago. The leeward coasts of the islands are formed by coral and shell sandy beaches. The windward shores are usually covered by storm beach gravel accumulations composed of dead corals, shells and other marine organisms, as well as by a beach-rock (Sociedad 1956). Many islands had inner lagoons with or without direct connection with the sea, bordered by mangroves. Many of these lagoons are still productive salt pans.

According to the measurements of the physico-chemical composition of the Los Roques waters, their primary productivity is very low (González 1989). Using the method of C^{14} the mean primary production of waters in the area of Dos Mosquises Island has been estimated at 25 mg C/m^2 per day (González 1989). It was concluded that the Los Roques waters are of oligotrophic character and present low values of nutrients and primary production. To explain the existence of a high biomass in waters of such a low productivity it has been argued that the Archipelago is a system highly efficient in the recycling of its nutrients and only small amounts of them are exported beyond it (González 1989). These data can be cautiously extrapolated to Las Aves and La Orchila groups.

Archipelago de Las Aves de Sotavento

This archipelago is located between 67° 40'-45' W, only 45 km to the east of the Dutch Island of Bonaire (Figure 4). It is separated by 150 km in straight line distance from the central-western

Venezuelan coast (Ginés and Yépez 1960). The Archipelago stretches about 9 km from north to south and a coral reef of 14.5 km in length borders it on the east.

Behind this barrier of live corals stretches a lagoon with shallow waters and with 5 islands, various sandy banks and reefs. The bigger island, called Ave Grande or Isla Larga, is situated to the east of the Archipelago. It is partly covered by mangroves that surround a long inner lagoon. Ave Grande has an important brackish water source called Los Cocos. Smaller islands such Isla Ramón, Isla Palmeras, Curricai and Isla Saki-Saki are located to the north of Ave Grande. All these islands are low and sandy and no basement rock outcrops as in Gran Roque and La Orchila islands.

These islands were mentioned since the mid 16th century (Pimentel 1964[1578]) and their long coral barrier reef caused dozens of shipwrecks. In 1678 about 15 warships from the French fleet under the Admiral Count de Estrées sunk when navigating along Las Aves, during an attempt to attack Curaçao Island (Labat 1722 in Barandiarán 1989; Briceño-Iragorry 1990). At present, apart from the Coast Guard, only a few temporary huts of fishermen are located in the islands of Ramón and Palmeras (Antczak 1993; Antczak and Antczak 1989a; 1989b).

Archipelago de Las Aves de Barlovento

This small archipelago is located between 67° 26'-31' W and 11° 48'-50' N, separated from Aves de Sotavento by a distance of 16 km and depth of about 600 m (Figure 14). A distance of approximately 40 km separates these islands from Los Roques Archipelago, to the east.

This archipelago is composed of 10 isles with a total surface of about 1.6 km² (Ginés and Yépez 1960). Two major islands, Isla del Faro and Isla del Tesoro, are situated in the southern part. The mangroves that surround the inner lagoon in Isla del Faro give shelter to considerable colonies of marine birds that gave their name to these islands. The environmental characteristics of these islands are very similar to these of Aves de Sotavento and Los Roques; at present they are uninhabited.

The islands of La Orchila

This group of islands is situated at 66° 6'-13' W and 11° 47'- 49' N, approximately 160 km north-east of the central Venezuelan coast and 52 km the east from Gran Roque Island (Figure 16). La Orchila, the main island of the group, has an approximate area of 20 km² (Schubert and Valastro 1976); it extends eastward along 11.5 km and its maximum width is 5.5 km north-east of La Orchila are situated Los Americanos or El Dorado, Los Holandeses and Cayo Sal cays, as well as sandy banks and reefs, surrounding an internal shallow lagoon.

About 10 percent of the area of La Orchila is covered by a Cretaceous and early Tertiary igneous-metamorphic complex that outcrops in the form of hills (Schubert and Moticska 1972;

Santamaría and Schubert 1974). The northern part of the main island has six hills; Cerro Walker, the highest one, reaches 135 masl (Schubert and Valastro 1976). A cluster of lower hills is situated in the interior of the island. More than 90 percent of the area of the island is formed by a flat limestone terrace of Sangamon age, 1 to 3 m high. This terrace is overlain by dry salt flats and marshes, inactive dunes, drying and growing mangrove swamps, storm beach deposits and reddish-brown alluvial sand and silt (Schubert and Valastro 1976: 1133). The climatic conditions resulted in salt-desert soil features characteristic of a considerable area of the island (Schubert 1974).The coast is largely covered by a narrow strip of coral and shell sand forming beaches with lagoons and salt marshes behind them. Sparse *Avicennia* sp. mangroves cover the limestone terrace and border the salt flats. The fauna and flora as well as the topographic features of La Orchila Island are very similar to that of the El Gran Roque; the overall environmental characteristics of the La Orchila cays are similar to Las Aves and Los Roques cays.

La Tortuga Island

Despite its proximity to the mainland, the environmental aspects of La Tortuga Island are not better known than those of the islands more distant from the continental shore (Figure 20). The group is located between 65° 15'-35' W and 10° 35'-45' N. La Tortuga, the main island of the group, is a plain calcareous platform, largely covered by a xeric vegetation. Only the north-eastern and central southern parts of the island are covered by mangroves. Three cays are situated to the north-west of the main island; they are small in size and closely resemble the Los Roques and Las Aves cays. Despite the fact that La Tortuga is the largest Venezuelan island after the Margarita, it has no native rodents, ophidians or mammals, except for the bats. At present, only a few temporary fishermens' huts are situated on the main island and on Cayo Herradura.

General climatic considerations

The mean annual temperature on La Orchila islands is 27.6°C, mean relative humidity reaches 82 percent, total annual rainfall is 150 mm and the total annual evaporation is 2,259 mm. The wind blows almost constantly in a west-southwest direction with mean velocity of 20.3 km/hr.

Since the 1950s, systematic measurements of climatic variables have been taken by the personnel of a military station on La Orchila Island. It can be assumed that the climatic data obtained in La Orchila can be cautiously used to describe the climates of Los Roques and Las Aves islands.

The month of major insolation in La Orchila Island is June, with a mean of 10.5 hours of sun per day; the minimum of 8.6 hr/day has been observed between November and January. The major concentrations of clouds has been noted between April-June and October-December (Ministerio de la Defensa 1988).

Due to the low altitude of these islands above sea level, the mean annual air temperatures registered in Los Roques are 28.9 °C (Laughlin et al. 1985) and 27 °C on La Orchila Island (Ministerio de la Defensa 1988), while the Antillean mean temperature is 25.1 °C (Blume 1974: 15). The temperature of water in Los Roques varies between 25.1 °C in February and 29.5 °C in September (Laughlin et al. 1985).

Hummelinck (1940) suggested that the islands situated between Curaçao and La Orchila have a mean precipitation between 340 and 680 mm, like their Dutch neighbours. Between 1961 and 1986, the mean rainfall registered on La Orchila Island was 321.8 mm; the months between February and June had the lowest mean precipitation (12.22 mm). The rainy season started in October with the maximum rainfall of 520 mm in December (Ministerio de la Defensa 1988).

The winds from the east and north-east blow on these islands (Méndez and Arias 1956). In Los Roques their velocity oscillates between 18.5 and 46.3 km/h (Laughlin et al. 1985). A mean velocity of 21 km/h has been mentioned in Los Roques islands (Méndez Baamonde 1978) while in La Orchila it was 22.7 km/h. The velocity of winds rises between February and June and they blow with minor intensity between September and November (Ministerio de la Defensa 1988). Tropical storms and hurricanes are quite infrequent phenomena in the area (see Alexander and Bertness 1982: 666); only 7 (1.6 %) of 445 hurricanes and 9 (3%) of 300 tropical storms reported in the North Atlantic came within 150 km of Margarita Island: 'On the average, one storm per five or six years may approach the [Margarita] island with sufficient force to affect the beach crest' (Alexander and Bertness 1982: 666). The disastrous effects of strong winds from the north and north-west have been reported since 1877 in Los Roques and other adjacent islands (Bruni Celli 1968 vol. 2: 310).

The yearly mean of visibility is of 20.8 km, being lower during the months of November and December (Ministerio de la Defensa 1988). However, as I could personally observe, the continental coast with all its mountains can be clearly seen from Los Roques and La Orchila islands during several days all through the year. The Dutch voyager Johannes De Laet (1988[1640]) noted in 1640, that from these islands it was easy to see the continental coast and *vice versa*. In 1841, the Belgian naturalist Jean Jules Linden (1987) saw Los Roques and La Orchila islands when he climbed the peak of the Silla de Caracas mountain (Cordillera de la Costa) during the last days of February. About two decades later, James Mudie Spence (1966[1871]: 59), an English naturalist, observed the same islands from the peak of Naiguatá (Cordillera de la Costa), 2765 masl.

The Guyana Current 'chokes' the Lesser Antilles and, upon entering the Caribbean from the east, converts into the Caribbean Current and further into a Gulf Stream. This superficial current flows with variable speed thorough the year from the east to west. According to the Atlas of Pilot Charts (1969) the speed with which a boat would move west, exclusively to the mercy of marine currents, in the area of Los Roques, is about 1.3 knots in February, one knot between February and

August, and much slower in September, October and December. The tidal movements on these islands range between 0.2 and 0.4 m and are almost imperceptible (Blume 1974:13; Cartografía Nacional 1973).

Méndez and Arias (1956), based on the classification of climate by Köppen (1948), compared the climate of Los Roques and La Orchila to that of a steppe with rare mists, high air humidity, seasonal lack of rainfall and high temperatures. According to the classification of arid ecosystems by Noy-Meir (1973), these islands can be considered as semi-arid with mean annual rainfall between 150 and 500 mm.

The insular ecosystems

This section includes only very sketchy information about the insular ecosystems; their components are presented in more detail in the Chapter 8, where the exploitation the insular resources by the Amerindian population is discussed.

The relatively small surfaces, the aridity of climate, the scarcity of freshwater and nutrients, as well as a considerable distance from the continent, influenced the low species richness of terrestrial biota, except for the marine birds. The birds are by far the richest non-marine faunal community, including resident as well as migratory species (Ginés and Yépez 1960; Phelps 1950). There are no mammals, rodents nor ophidians indigenous to these islands (Sociedad 1956; Eisenberg 1978). In Gran Roque and La Orchila Islands live *iguanas* (*Iguana I. iguana*) and all islands abound in small lizards (Roze 1956). The vegetation is dominated by xeric grasses and mangroves (Aristigueta 1956).

The marine ecosystem of Los Roques, like that of other coral reef systems, is mature and of great complexity, being one of the most evolved within the marine environment (Cervigón 1972; Losada 1976). This ecosystem is composed of interdependent communities or biocenosis of (1) intertidal zones, (2) coral reefs, (3) sea grass beds, (4) mangroves and lagoons, and (5) the pelagic media (Laughlin 1982). The first four communities develop within the benthic realm that is much more varied that the pelagic one, and clusters more mature and complex communities, due to its lesser exposure to random environmental fluctuations (Cervigón 1972: 316). The marine resources of these islands, highly coveted by man, are turtles (Weil and Laughlin 1983; Weil 1984; Buitrago 1987 a ,b; Hedelvy and Vernet 1992), lobsters (Hauschild and Weil 1983; Hauschild and Laughlin 1985), reef fishes (Posada et al. 1988; Posada 1989; Amend 1992b), and *Strombus gigas* (Brownell 1977; Weil and Laughlin 1982; 1984; Laughlin and Hauschild 1985). Los Roques and, to a lesser extent, Las Aves de Sotavento Archipelago, sustain great populations of *botuto* (*Strombus gigas*), and its natural density is among the highest in the Caribbean (Laughlin and Weil 1985). Ninety percent of Venezuelan lobster is caught in Los Roques islands. A few years ago, almost all the national Venezuelan production of *botuto* also came from that area.

The ichthyofauna of these oceanic islands is generally similar to that of the majority of the Antillean islands, but dissimilar to the continental islands Margarita, Coche and Cubagua. This is because the eastern Venezuelan coasts are affected by the phenomenon of upwelling. The coasts of Guayana are also dissimilar since they are affected by the contributions of the Orinoco River (Cervigón 1972).

Previous archaeological discoveries

The history of the recovery of Amerindian artefacts on the islands of Federal Dependencies of Venezuela, prior to the present research project, is very brief. In September of 1871, Adolph Ernst, the President of the Society of Physical and Natural Sciences of Caracas, visited Los Roques (Bruni Celli 1988 vol. 4: 33-35). On Fish Key Island, he located a shell midden, and following the Danish nomenclature of that time, he called it a *kjökkenmödding*. The midden had the shape of an irregular cone 3m in height and 25m in circumference. It was mainly composed of compacted *Strombus gigas* and *Cittarium pica* shells. Ernst considered that the midden was a product of the 'human groups extinct a long time ago' (Bruni Celli 1988, vol.4: 34). According to the map of James Mudie Spence (Spence 1966[1871]) the Fish Key was located in the south-eastern part of the Archipelago. However, during the survey carried out as a part of this Project, no shell midden has been located within the area indicated by Ernst. It can be suggested that, given the compact nature of Ernst's midden, he most likely described a 19th century lime burning locus whose remains were scattered precisely in the south-eastern area of the Archipelago. Lime was obtained from burnt shells and corals during the 19th century in many Venezuelan islands (Antczak and Antczak 1986b). It is noteworthy that pre-Hispanic, colonial, as well as contemporary shell middens discovered in Los Roques during the present research are composed almost exclusively of *Strombus gigas* discarded loosely, so that none resemble Ernst's compact midden. I cannot demonstrate, however, that Ernst was describing the area of these lime loci, rather than a prehistoric shell midden. The area indicated by Ernst as a location of a *kjökkenmödding* is presently largely covered by mangroves, so the midden could have been overlooked during the present survey.

Ernst's intuition regarding the presence of the ancient human remains on these islands was correct. During the visit to Los Roques he established friendship with Luis Cornelius Boyé, a Dutch citizen who, by that time, was exploiting the salt pans on Cayo Sal and lived in Gran Roque Island. In August 1873 Boyé sent to Ernst a package containing 'three pieces of Indian pottery and a fragment of a bone' that were recovered during the 30 feet deep diggings performed in one hill of Gran Roque Island, called *Batería* (Bruni Celli vol.2 1988: 109, 112, 116). However, during the survey of Gran Roque Island, carried out as a part of the present research project, not a sign of Amerindian activity was observed in the area of the Los Roques hills. If, in fact, the finds were recovered at a depth of 9 m, then negative evidence obtained during the present survey is not surprising. The cultural and chronological meaning of Boyé's findings, must remain unanswered. Unfortunately, the archaeological artefacts sent by Boyé, as well as the descriptive letter that accompanied them, were forgotten.

In the 1950s, the Sociedad de Ciencias Naturales La Salle from Caracas, organised three multidisciplinary expeditions to Los Roques and La Orchila islands (Sociedad 1956). During these expeditions some Amerindian artefacts were discovered on two islands (Jam 1956) and classified by Cruxent and Rouse (1958) as belonging to the Valencioid series.

During the decade of the 1970s, some Amerindian artefacts were also found by the personnel and members of Los Roques Scientific Foundation, on Dos Mosquises Island, before the present project began, in 1982 (Henrique Lander, Rolf Römer, Joaquín Buitrago, Ernesto Weil, personal communication 1982-83).

The islands and the Province of Venezuela

In the Chapter 4, I outlined the cultural panorama of the 16th century north-central continental Venezuela in the light of ethnohistoric evidence. My aim in this section is to include the islands located off the central coast into this panorama.

It seems probable that some of these islands were seen during the voyage of Juan de La Cosa and Alonso Ojeda in 1499 (Barandiarán 1989: 250-1); however, they are not depicted in the map made by Juan de La Cosa in 1500 (see Oliver 1989, figure 40). In fact the early Spanish maps of this part of America seem to distinguish only barely between Los Roques and Las Aves groups, while completely neglecting the separation between the two Las Aves groups of islands (Antczak and Antczak 1986b). I suppose that even in 1528, when the Sovereign made the primitive territorial ordinance of this part of the New World (*Capitulación de los Welser*), these islands remained largely unexplored. In this ordinance the islands were conceded to the Province of Venezuela (Ojer 1983: 144-5) but not until the last decades of the 16th century, were they more closely, although still superficially, surveyed by the Spaniards. By that time, after the fall of the pearl fishery on Cubagua Island, this precious resource was frenetically searched for in almost all Venezuelan islands, although without success (Arellano Moreno 1950: 180; Farías 1983).

Even in 1578, by the time of the Governor Pimentel's *Relación*, discussed in Chapter 4, the knowledge of the geography and environment of these islands was very imperfect. The following fragment of the *Relación* not only confirms this imperfect knowledge but, above all, calls attention to a little known passage regarding the Amerindian presence on these islands:

> the islands that are facing this coast are located about 15 or 20 leagues in to the sea. These are La Orchila and the Aves Island [i.e. Archipelagos of Las Aves], Los Roques, La Tortuga and two others that are further to the west...[they] are low islands and not large. La Orchila [...] has a small hill, and the Aves Island also has two or three hills, but not as high; La Orchila and Isla de Aves have some water [potable brackish water] and in one or two of them there is a lot of salt, [many] rabbits, and an abundance of fish in all of them...they [the islands] are more mountainous than flat, [covered by the mangrove] the bush [is] worthless and small. It is understood that in Los Roques and the Aves Island, and also in the other islands, there are pearls. The caravel of Count de Niva, Virrey of Peru was lost at night [near] Las Aves Island. Many lost their lives because they could not find refuge. Through the natives [*por vía de naturales*], Capt. Faxardo [Fajardo] received the news of the [shipwreck] and, thus, sent there pirogues, bringing back some of the people and [other] lost things (Pimentel 1578 in Nectario María 1979: 331-351).

Pimentel did not distinguish between the Aves de Sotavento and the Barlovento Archipelagos; however, I suspect that the shipwreck occurred on Las Aves de Sotavento, since its reefs proved to be much more threatening than those of the Barlovento group. The quote above clearly indicates that at the time when the shipwreck occurred an unidentified Amerindian group was present on these islands or navigated the waters that surrounded them. Since Pimentel referred to Fajardo as a person who ordered the rescue, than the event must have happened between 1555 and the beginning of the 1560s, when Fajardo was actively engaged in the conquest of the Province of Caracas (Oviedo y Baños 1982[1723]). Who were these Indians? Were they the *Caraca* or *Guayquerí* Indians from the central coast, Fajardo's *Guayqueries* from the Margarita Island (McCorkle 1952), or the *Caquetío* who inhabited the islands of Curaçao, Aruba and Bonaire (Oliver 1989; Haviser 1991) to the west?

About thirty years later, in September of 1589, by order of the Governor don Diego Osorio, the islands were formally possessed by the Spanish Crown. During this act 'in all these islands [Las Aves, Los Roques, La Orchila and La Tortuga] mass was celebrated and crucifixes were erected as well as other acts of possession that were carried out in name of the King Our Lord' (Actas del Cabildo de Caracas 1982). During these official visits to the islands the Spaniards were assisted by the 'auxiliary Indians' (*indios auxiliaries*) and all the mission navigated in 'one canoe and three pirogues' (Actas del Cabildo 1982). It can be suggested that the 'auxiliary Indians' served not only as a paddlers but, above all, as a guides to these largely unknown and dangerous coral islands. Were some of these guides the old *Caraca* navigators who knew the route from their traditional incursions to these islands? Undoubtedly, the firsthand information about the insular environs that had been gathered during these official visits was vast and detailed, and improved considerably the exactitude of the later Spanish maps of this region. The ambitious 'guide' for sailors to the New World seas from 1592 was accompanied by separate, though simple, maps and relatively precise descriptions of all these islands of the Province of Venezuela (Vellerino de Villalobos 1984[1592].

In summary, during the 16th century Las Aves, Los Roques, La Orchila and La Tortuga islands were considered an integral part of the Province of Venezuela. Furthermore, the data indicate that even in the 1550s some culturally unidentified Amerindian groups visited the Las Aves de Sotavento Archipelago and/or navigated the waters surrounding it. It can be inferred that these islands would have been more related to the central coast, since the Indians did not communicate the news about such an important shipwreck to the Spaniards settled in Borbuata or Coro, to the west, but to Fajardo, who operated on the central coast. Were these Indians the remnants of the *Caraca* who, according to Pimentel, still visited these islands in annual cycles, in the first decades of the 16th century? How would, however, the *Caraca* or other coastal groups, have navigated to these islands distant from their homeland in these cruel times of Spanish and the already mentioned Grenada's Carib slave raids and the uncompromising war with the Conquerors of the Province of Caracas?

I would also indicate that according to diverse late 16th to 19th century data consulted, no mention of Amerindian presence on the islands off the central Venezuelan coast was found (Navarette 1570 in Arellano Moreno 1950: 49; De Laet 1988[1640]: 1240; Alcedo 1988[1786-89]:72; Dampier in Bidwell 1970; Codazzi 1960[1855]; Appun 1961[1871]); Spence 1966[1871]; see also Hadgialy 1956; Jam and Burgaña 1956; Ojer n.d.; Barandiarán and Castillo 1973; Vila 1980; Cardot 1982; Carrillo Batalla 1982; Farías 1983).

Chapter Six

Fieldwork procedures

Field programme

The fieldwork on the islands off the central Venezuelan coast, embedded into the present research project and co-ordinated by Marlena Antczak and myself, started in 1982, in the Los Roques Archipelago. The main extensive excavations were carried out in Dos Mosquises Island, between 1982-85, 1988-89, and 1991-94, in Krasky in 1984, Domusky Norte in 1986 and 1996, and Cayo Sal in 1984 and 1986 (Antczak and Antczak 1992b).

Since 1985, the project also embraced the islands located to the west and east of the Los Roques Archipelago. In 1987, the Archipelago de Las Aves de Barlovento was visited for the first time and a site in the Isla del Tesoro was located and excavated. Between June-July 1988, in a six-week field season, the La Orchila Islands were prospected and excavations were carried out in the Los Mangles site. During 10 days of March/April 1988, survey and excavations were carried out in the Archipelago de Las Aves de Sotavento; the inshore islands facing Puerto Cabello were explored during the same year. The inshore cays of the Morrocoy National Park, on the western coast, were surveyed in 1989, 1992 and 1995. La Tortuga Island was visited for the first time in May 1990 and prospected during 10 days of the next month. Afterwards, a four-week programme of survey and excavations was carried out at the Punta Salina site, in May of 1992, and the Los Cumaneces site was excavated during three-weeks of April 1996. Between June and July 1992, new four-weeks excavations were carried out in both Archipelagos de Las Aves de Sotavento and Barlovento. Regarding the mainland, the most important archaeological sites in the Valencia Basin were visited in 1996. New coastal sites were located in Patanemo and Osma bays, and several other sites in the central, central-western and central-eastern coast were surveyed and/or revisited during 1995 and 1996.

Up to the present, 55 offshore and six inshore islands, located to the north of the central and western Venezuelan coast, have been surveyed; 47 pre-Hispanic Amerindian sites were located; 942 m^2 have been excavated, distributed between 224 test pits and 14 extensive trenches.

Methods

During the first stage of the fieldwork the emphasis was put on pedestrian survey of all the islands, including, as far as possible, all seasonally flooded areas and those covered by mangroves. The field-walking was guided by the results of previous analysis of maps and stereoscopic aerial photographs of La Orchila, Los Roques and, partly, La Tortuga Island, at a scale of 1: 6.000 (Cartografia Nacional 1972). During the field-walking surface sampling was carried out and test pits of 1 x 1 m and 0.5 x 0.5 m were excavated in arbitrary levels of 20 cm combined with observations of natural stratigraphy. These relatively thick layers were utilised in the excavations of all sites, given that the majority of them had great numbers of *Strombus gigas* shells incorporated within their cultural deposits. It is noteworthy that one a single adult shell, which can achieve a length between 25 and 30 cm, disposed vertically within the cultural matrix can extend beyond one layer of 20 cm, and, in consequence, the attempt to distinguish tiny layers within the deposits dominated by the *Strombus gigas* shells are often unrealisable.

On the basis of the results of the surface and test-pit samplings, several sites were chosen for extensive excavation in a process of a judgement or purposeful sampling (see Redman 1979). We selected those sites that revealed quantitatively abundant and qualitatively diverse cultural remains; especially important were deposits that contained stylistically significant pottery assemblages, rich zooarchaeological remains and a potential for recovery of activity areas. The potential to obtain a good sample for radiocarbon age determination was also an important criterion. However, several non-artefact and non-context-related criteria (the probable strategic position of the site within the island, and of the island within the group of islands or Archipelago, its proximity to a good landing beach, easy access to abundant and diverse marine and/or terrestrial resources) were also taken into account.

The site in Dos Mosquises Island was selected for extensive excavation since the test-pit sampling yielded, from the beginning, a diverse and abundant archaeological material; the potential for the recovery of activity areas in this site was considerable. Additionally, other factors of diverse nature such as the strategic geographical location of this island within the Archipelago, as well as the proximity of this site to the installations of the Marine Station, where the archaeological field-lab was installed, strongly biased the excavation strategy on this island. The Cayo Sal Island was selected for extensive excavations due to the proximity of the site to both the salt pans and the supposed 'ancient' mega-middens of *Strombus gigas*. During the survey, the Domusky Norte site yielded pottery stylistically different from any other site in Los Roques Archipelago. Extensive excavations were carried out there to obtain a representative sample of this material, to recover the activity areas and zooarchaeological sample, as well as to gain insight into the contextual associations of clay figurines that were found there during the survey. The Krasky Island site was extensively excavated in order to gather contextual data as a complement to the collection of artefacts obtained in the 1950s in this island.

Outside the Los Roques Archipelago, Los Mangles was the only site in the La Orchila Island group where diverse archaeological remains were concentrated both vertically and horizontally so as to enable the recovery of artefacts in activity-related contexts. The Ave Grande site was excavated because of its proximity to the most important reservoir of fresh water in all the Las Aves Archipelago. Los Cumaneces was, until present, the only site located in La Tortuga Island whose structure and content represented a potential to recover diagnostic ceramic material so as determine its cultural and chronological affiliation, as well as to discover activity areas.

About 50% of the soil from all the extensively excavated sites was dry screened using a 1 mm^2 metal mesh (see Table 10). The extensive excavations were carried out in the arbitrary levels of 20 cm; however, the natural/cultural stratigraphical features were also recorded.

Logistics and philosophy

Between 1982-86, during the first period of survey and excavations in Los Roques Archipelago, the fieldwork usually lasted between a month and a half and a five months. In the second (1988-89) and third phases (1991-94) they were shorter and lasted between three days and three weeks. Overall, between 1982 and 1996 more than 60 expeditions to Los Roques islands were carried out and fieldwork in this archipelago took about 25 months in total.

The long-term fieldwork has a profound significance for our research. In an idealistic attempt to anchor, as well as possible, our interpretations of the archaeological past in the natural setting of the islands, we aimed to embed ourselves into the seasonal climatic rhythms and their ecological consequences. The relationship with the marine biologists from the Dos Mosquises Marine Station was of great value in our understanding of the ecology of different zones of the Archipelago. Long months were spent living with local fishermen, participating in all their activities, taking notes and building up the comparative zooarchaeological collections of the modern faunas.

The research, especially in Los Roques Archipelago, has not been rigidly separated into the stages of field and laboratory work and interpretation. It is rather a continuous interplay between the lab and the field, between the islands and the mainland, between the present and the past, mediated by our overall personal experience. We consider excavation as a culture contact (see Richards 1995). During the fieldwork, several days were sometimes dedicated to discussing and interpreting an open archaeological context until the 'interrogation' of the material remains and their spatial associations slowly determined the next step of the excavation. This dissertation is not the final statement about the prehistory of these islands but rather a phase in an ongoing process of learning about the insular environment and the Amerindians who lived there. As a direct consequence of this concept of 'participative' fieldwork we got involved in the activities oriented toward the promotion of the investigation in the insular environments (Antczak and Antczak 1987c; Laine and Marcano 1992; Lentino et al. 1994), environmental education and preservation of endangered species (Antczak and Antczak 1986a; 1988d), protection of the historic and prehistoric sites (Antczak and Antczak 1985; 1987a; 1988c; 1992a) and the assessment of the impact of the tourism on the insular ecosystems (Gutic et al. 1993).

Chapter Seven

Site and assemblage characteristics

Stylistically defined assemblages

This chapter provides the general information about the setting, vertical and horizontal structure and content of the insular archaeological sites. The temporo-spatial characteristics and stylistic relationships of the ceramic assemblages are also discussed. It should be noted that the discussion of the Los Roques Archipelago ceramic assemblages is very concise since, this subject will be covered in detail in the PhD dissertation of Marlena Antczak (forthcoming). The DM site is selected for detailed analysis of structure and content, provided in the Chapter 8. For this reason, only the temporo-spatial characteristics of the ceramic assemblages recovered in these three sites are discussed in this chapter.

Saladoid assemblage

Los Cumaneces (TR/H)

In 1992, the Los Cumaneces site (TR/H) in the north-eastern coast of La Tortuga Island was located. The site is situated on a wide sandy beach, about 75 meters inland of a small bay of shallow waters (Figures 20 and 21). To the east of the site stretches an area of mangroves that borders a series of bays and lagoons. In 1996 extensive excavation was carried out in the site.

Amerindian artefacts began to appear at between 10 and 15 cm beneath the surface, and the bottom of the cultural deposit was reached at 40-45 cm. However, scarce sherds, *Cittarium pica* shells, flakes of quartz, as well as charcoal were occasionally found within a yellowish sand, to the depth of 65-77 cm.

TABLE 3. *Amerindian sites and excavations in the La Tortuga Islands.*

Island	Site code	Site extension (m²)	Site max. depth (cm)	Pits #	Pits m²	Trenches #	Trenches m²	Total excavated (m²)	Stylistic affiliation
Punta Salina	IT/TR/B	96	75	2	3	1	13	16	undefined
Punta Delgada	IT/TR/A1	?	?	4	2	-	-	2	Saladoid
Los Cumaneces	IT/TR/H	110	77	7	7	2	53	60	Saladoid
Laguna de Ostras	IT/TR/E	?	0	4	2	-	-	2	Dabajuroid?
Garambeo	IT/TR/C	?	10	4	2	-	-	2	undefined
Playa Cangrejo	IT/TR/D	?	0	4	2	-	-	2	undefined
Los Hoyos	IT/TR/F	70	20	4	2	-	-	2	undefined
Punta Delgada	IT/TR/A2	?	0	4	2	-	-	2	undefined
Total		206		33	22	3	66	88	

Chronological indicators

Two samples for radiocarbon age determination were taken in the TR/H site from two hearths laying within the same pit, one above the another, separated by a 12 cm thick layer of a sterile sand. The deeper hearth, about eight centimetres thick, lay at a depth of between 44 and 52 cm; the upper one, three centimetres thick, was deposited exactly above the first one, at a depth of 32 cm. Surprisingly, the deeper hearth gave the date of 990±90 b.p. (I-18,563) and the shallower 1820±80 b.p. (I-18,562), which represents an inversion of the expected results. Taking into account the overall structural, contextual and environmental characteristics of the Los Cumaneces site, we reject the order of these dates and consider it as a direct outcome of an error in labelling the samples and/or in handling and repackaging them, on their way between the field and the Teledyne Isotopes Lab. New samples from this site will be processed to confirm or refute the present ones.

Few archaeological phenomena suggest that the TR/H site would have been reoccupied during the span of about 900 years which elapsed between the radiocarbon dates. Two layers of a yellow-grey sand associated with artefacts and zooarchaeological remains were observed in few sections of the main trench, distributed at depths between 15-25 and 30-40 cm approximately; however, these layers are short and discontinuous, beginning and ending in non-stratified deposits. If these layers may be considered as the results of two periods of occupation of the site, then each of them can be interpreted as the remains of a series of a short-time campsites established by the culturally relatively homogenous peoples, since no differences in ceramic stylistic attributes were observed within the pottery samples recovered from the levels 0-20, 20-40 and 40-60 cm.

Another indicator of the re-occupation of the site is provided by the analyses of spatial distribution of the hearths. Thirty five well preserved hearths were recovered; their diameters varied between 20 and 120 cm and they were between one and eight centimetres thick. The hearths were scattered vertically between the depths of 10 and 55 cm. 23 (66%) hearths were recovered at depths

TABLE 4. *Radiocarbon dates from Amerindian sites on Venezuelan islands (Central Islands). Not calibrated.*

Island	Site code	Sample code	Sample context/depth	Years b p.	Years a d.	Reference
Curricai	CR/A/3	I-17,219	Hearth; 35 cm	420 ± 80	1530	Antczak & Antczak 1993
Isla del Tesoro	IT/A/1	I-16,278	Hearth; 57 cm	420 ± 80	1530	Antczak & Antczak 1993
Ave Grande	AG/A/1	I-17,218	Hearth; 38-40 cm	470 ± 80	1480	Antczak & Antczak 1993
Dos Mosquises	DM/A/C/10	I-15,087	Hearth; 45-47 cm	470 ± 80	1480	Antczak & Antczak 1991
Dos Mosquises	A/B/9	I-16,294	Hearth; 38 cm	490 ± 80	1460	Antczak & Antczak 1991
Dos Mosquises	DM/A/C/11	I-15,088	Hearth; 38 cm	520 ± 80	1430	Antczak & Antczak 1991
La Orchila	OR/F/A/6	I-16,323	Hearth; 63 cm	580 ± 80	1370	Antczak & Antczak 1993
Domusky Norte	DMN/A/23	I-15,089	Hearth; 61 cm	620 ± 80	1330	Antczak & Antczak 1991
Dos Mosquises	DM/A/1K	I-16,279	Hearth; 43-49 cm	680 ± 80	1270	Antczak & Antczak 1991
Ave Grande	AG/B/2	I-16,286	Hearth; 43 cm	690 ± 80	1260	Antczak & Antczak 1993
Cayo Sal	CS/D/1	I-16-287	Hearth; 35 cm	750 ± 100	1200	Antczak & Antczak 1991
Domusky Norte	DMN/1/50	I-18,582	Hearth; 50 cm	880 ± 80	1070	Antczak & Antczak 1998
Domusky Norte	DMN/6/33	I-18,580	Hearth; 33 cm	890 ± 90	1060	Antczak & Antczak 1998
Domusky Norte	DMN/2/35	I-18,581	Hearth; 35 cm	930 ± 80	1020	Antczak & Antczak 1998
La Tortuga	TR/H/16/44	I-18,563	Hearth: 44 cm	990 ± 90	960	Antczak & Antczak 1998
La Tortuga	TR/H/16/32	I-18,562	Hearth: 32 cm	1820 ± 80	130	Antczak & Antczak 1998

between 20 and 40 cm: 11 were found between 20-30 cm and 12 between 30-40 cm, indicating no preferential vertical distribution within the level. The hearths were also scattered horizontally except for four cases where two hearths were situated one above another and were clearly separated by a layer of a culturally sterile sand.

Ceramic assemblage

The pottery from the TR/H site totals 900 sherds; only 15 (1.5%) of them are decorated. The decoration is almost exclusively restricted to rims and includes broad and shallow short and long incisions, punctation and application (Figure 23).

Two rims show short, concentric, semicircle linear incisions that are discontinuously disposed horizontally and vertically on labial extensions and occasionally enclose a single punctation. These curvilinear incisions occur in combination with a rectilinear incision that takes the form of two continuous, parallel lines around the rim. One body sherd is decorated with circular lines that enclose a single punctation, and another, which is heavily eroded, is decorated with incised circular lines occasionally connected with each other by shorter curvilinear incisions (Figure 23). One labial extension shows three short vertical parallel lines and one broader horizontal incision; these incisions are enclosed by four- cornered single punctations. Two rims show short wave like linear incisions that enclose single punctations. One body sherd has appliqué in the form of a small ball, two short parallel lines and a conical perforation. One rim is decorated with two parallel straight lines that extend around the rim and is combined with appliqué in the form of a small knob, or protuberance, attached to the rim's top that bears a single punctation on its inner surface. These decorated sherds I define as a Short Incised-Punctated type.

Six decorated sherds are not incised. One is a fragment of a modelled rim or a handle with four punctations on its inner side; additionally three separated punctations are distributed directly on the lip's border (Figure 23). One large solid strap handle and two smaller strip narrow handles were also recovered; both types of handles were probably affixed vertically on the vessel's wall. Only one sherd in the collection shows tiny traces of a wide white painted line, probably, over a plain surface. In addition to the fragments of vessels, one leg of a solid human figurine and a small fragment of griddle were also recovered at 25 and 32 cm respectively. Except for the figurine leg all the remaining decorated sherds were recovered from the lower part of the level at 20-40 cm.

Regarding the forms of the vessels, the high occurrence of simple open bowls is striking; three fragments of annular bases and seven fragments of globular ollas were also recovered. The Short Incised-Punctated type is represented by at least four shallow open bowls.

Stylistic and chronological correlation

The ceramic assemblage from the Los Cumaneces site shows certain stylistic relationships with the geographically closest Río Guapo style located on the bank of the Guapo River, close to the central-eastern Venezuelan coast. The cultural deposit, located about 4.5 meters below the surface, was excavated by Cruxent and Acosta Saignes in 1949 (Cruxent 1949) and radiocarbon dated in 1960 (Rouse and Cruxent 1963). Rouse and Cruxent considered the Río Guapo assemblage 'as a by-product of an expansion of the Saladoid series westward along the coast shortly after the time of Christ' (Rouse and Cruxent 1963: 110). However, they did not include the Río Guapo assemblage directly within the Saladoid series due to the lack of painting, which is diagnostic for that series. The radiocarbon date of 1630 ± 100 b.p. or a.d. 320, obtained from the sample from the Río Guapo site (Rouse and Cruxent 1963), fits with the Saladoid temporal span; however, the precise stylistic affiliation of this assemblage is still a matter of controversy.

According to the hypothesis of Chanlatte-Baik (1983), the zoned incised cross-hatched decoration of the Río Guapo pottery is related to the similar decoration on the pottery recovered from Vieques Island, near the eastern coast of Puerto Rico, and in consequence, the Río Guapo assemblage may be considered an ancestor of that insular assemblage. The existence of maritime routes that could enable the exportation of Middle Orinoco pre-agricultural traits through the central Venezuelan coast toward the Greater Antilles (Dominican Republic), as early as during the second half of the first millennium b.c., was suggested by Zucchi (1984). Arvelo and Wagner (1984) postulated the existence of a long-lived prehistoric sphere of interaction that involved north-western Venezuela, north-eastern Colombia and the Greater Antilles. Even though all these hypotheses are oriented to indicate early cultural links between central Venezuela and the Greater Antilles, they have to be extensively tested against diverse types of archaeological data to be conclusive.

The repertoire of decorative techniques and motifs of the Los Cumaneces ceramic assemblage is severely impoverished in comparison to the Río Guapo assemblage. Important traits that are diagnostic to the Río Guapo style, such as the zoned incised cross-hatching, that links it with other early ceramics of the continent (Reichel Dolmatoff 1986: 63; Meggers and Evans 1964: 376; Lathrap 1970; Rouse 1985), are absent in the Los Cumaneces pottery. It also lacks zoomorphic modelled adornos (Cruxent and Rouse 1958, vol.1: 185). The decorative traits that link both assemblages are the incised line or lines on extended lips that surround all the rim of the vessel (see Cruxent and Rouse 1958, vol. 2, Pl. 37; 16) and the extended incised lips with appliqué with punctures (Cruxent and Rouse vol. 2, 1958, Fig. 75: 7, 10). The forms of the vessels are also strikingly similar between both assemblages and are composed almost exclusively of a variety of open bowls. The annular bases recovered in the Los Cumaneces site were also recovered in the Río Guapo site (see Cruxent and Rouse 1958, vol. 1: 184). The original presence of painting in both ceramic assemblages cannot be ruled out. The surfaces of the sherds from both sites are eroded by the abrasive effects of sand, water, and, (in the case of the insular site), also the action of salt, that could wash out the painting (Cruxent and Rouse 1958). Griddles are very scarce in both sites.

Apart from these similarities with the Río Guapo assemblages, the Short Incised-Punctated pottery from Los Cumaneces site has much in common with the first millennium b.c. Saladoid tradition of the Middle Orinoco (see especially Howard 1943, Pl. 3, O, P; Pl. 5, B, C, N; Pl. 3, L; Pl. 5, C; see also Cruxent and Rouse 1958; Rouse et al. 1976; Roosevelt 1980; Vargas 1981). The rims with punctations on top, from Los Cumaneces site, are present within the Ronquín-phase pottery assemblage from Ronquín (Roosevelt 1980: Fig.51).

Stylistic links can be also indicated with the Saladoid assemblages from the eastern Venezuelan coast, especially with the assemblage excavated in the El Cuartel site, in the Carúpano area, eastern Venezuelan coast, dated to a.d. 290 (error-margin not given, Vargas 1979: 206). Several sherds with decoration on the flat border of the lip were described by Vargas (1979: 180-181) as unclassified decorated sherds of this assemblage (Figure 65b, 66a, 67c). Some of these decorations consist of short, wide (Figure 65B) or fine incisions (Figure 66A). Among these sherds there is a rim with isolated punctures disposed directly on top, that is strikingly similar to those of the modelled and punctated sherd from the Los Cumaneces site, and similar to the already mentioned rims from Ronquín. Similarly ball-like appliqués were common in the El Mayal (Cruxent and Rouse 1958, 2, Fig. 92, 4) and Cuartel sites (Vargas 1979: Lam.15, C,D). Also vertical strap handles (Lam. 13B, 21B) and incised labial extensions (Vargas 1979: Lam.19A) are present in the Cuartel assemblage, as well as at the El Mayal site (Cruxent and Rouse 1958).

It is premature to provide definite conclusions about the stylistic relationships of the Los Cumaneces assemblage drawn only from one radiocarbon date and a reduced collection of decorated sherds; however, I would like to suggest certain stimulating probabilities. If the radiocarbon date of 1820±80 b.p. for the ceramic assemblage from the TR/H is confirmed by new dating, then this assemblage can be considered as one of the earliest remains of the Saladoid presence on the central-eastern Venezuelan coast. Moreover, it would be contemporary with, or even earlier than the El Mayal and Irapa Saladoid styles dated to 1795±80 and 1580±40 b.p. (Rouse and Cruxent 1963), as well as to the El Cuartel pottery dated to a.d. 290 (Vargas 1979: 28, 206), all of them situated on the eastern Venezuelan coast. These data may suggest that the Los Cumaneces pottery might have been carried by the avant-garde of the Middle Orinoco Ronquinan Saladoids who might have migrated toward the north, through the eastern plains area towards the central-eastern coast, rather than arriving at La Tortuga Island from the eastern Venezuelan coast (see Rouse 1985).

The insular setting of the Los Cumaneces assemblage poses several questions that constrain attempts to determine its specific stylistic affiliation. It is difficult to resolve whether or not the overall scarcity of decorated sherds, and the poverty or absence of the decorative traits and motifs, that are diagnostic to Saladoid ceramics, can be only attributed to the temporary and remote character of the TR/H campsites and, in consequence, would be a reflection of the overall rudimentary cultural baggage of the avant-garde Saladoid raiders. In sum, could the stylistic poverty be explained by the operation of a 'founder's effect', according to which the population moving toward the periphery would bring only a part of the traits of the parental stock, or rather a result of the specialised function of the insular campsites? (see Oliver 1991: 32).

Until new pertinent data can be gathered in the La Tortuga Island and the adjacent mainland all above hypotheses should remain tentative.

Ocumaroid assemblage

Domusky Norte (DMN)

The only insular site whose pottery can be tentatively related to the Ocumaroid series (Cruxent and Rouse 1958) was located on the small Domusky Norte Island, at the western border of the Los Roques Archipelago (Figures 25, 26, 66 and 67).

Comparative analyses of the traits of the Domusky Norte pottery recovered in 1986 suggested a relationship with the Ocumaroid series (Colmenares 1990; Antczak and Antczak 1991). However, the results of the extensive excavations carried out in 1996, as well as the re-consideration of the former classification, weakened any definitive Ocumaroid affiliation for the Domusky Norte assemblage. Even though the DMN/A ceramic assemblage retains certain Ocumaroid stylistic traits it can rather be considered as representative of a new style within the Ocumaroid series. In addition the presence of Valencioid pottery within this assemblage indicates the interaction between the bearers of the two pottery traditions during the entire span of time of occupation at the site.

Regarding the chronology of the Domusky Norte Island assemblage, the first radiocarbon sample processed in 1987 was dated to 620±80 b.p. or a.d. 1330 (Antczak and Antczak 1989c; 1991b), indicating a late prehistoric origin. The Domusky Norte assemblage was placed in Haviser's chronological chart for Bonaire and adjacent areas (Haviser 1991: 62, Fig. 28) as a component affiliated to the Krasky style, despite the fact that the Krasky style is the only insular archaeological assemblage related to the Valencioid series that was known long before the present project began (Jam 1956; Cruxent and Rouse 1958). Haviser also suggested that the Domusky Norte Island assemblage, classified as Ocumaroid (Colmenares 1990; Antczak and Antczak 1991), had in its 'earliest components' the pottery of the Wanapa style from Bonaire, 'albeit only slightly' (Haviser 1991: 65). As a consequence, he argued that this 'early component' could be indicative of an early Ocumaroid spread, reaching Los Roques from the coast at about the same time as Bonaire, rather than spreading via Bonaire (Haviser 1991). Haviser (1991: 200) suggested the centre of this purported spread into Los Roques, Las Aves, Bonaire and Curaçao islands is the Caribbean coast at the Tocuyo, Aroa, Yaracuy outlets Areas. The suggested time of this event is about a.d. 500 (Haviser 1991: 200).

Three recent radiocarbon dates, ranging between a.d. 1020 and 1070 (Table 4 [Antczak and Antczak n.d.]), as well as the presence of Valencioid sherds thorough all the occupational sequence of Domusky Norte site observed during the extensive 1996 fieldwork, once more confirms the late prehistoric origin of this assemblage.

Dabajuroid assemblages

Ave Grande (AG/A)

The AG/A site is located toward the northern coast of the Ave Grande, the major island within the Las Aves de Sotavento group (Figures 4 and 7).

The pottery recovered in this site is coarse, tempered with sand and mica and, probably due to the weathering, has rather rough surfaces. Only 46 (6%) of sherds are decorated with corrugation, painting, incision and/or appliqué (Figures 9-11). The most common decorated sherds are corrugated rims that range from zero to six coils, with or without thumb impressions (for specific definition of this decorative technique see Oliver 1989; 1997). The corrugations occur exclusively in the 'ordinary ware' vessel types, such as medium and large sized semi-globular and hemispherical cooking and storage ollas.

The painting is dominated by combination of rectilinear and semi-circular, broad and narrow, parallel and diagonal bands, and also includes the radial 'sun' motif (see also Oliver 1989, vol.2, Fig.C-61). The painting is executed in Black and Red on White, or on Buff (natural), and is often displayed on the external and internal sides of restricted and unrestricted bowls, with simple annular

TABLE 5. *Amerindian sites and excavations in the Las Aves de Sotavento Archipelago.*

Island	Site code	Site area (m^2)	Site max. depth (cm)	Pit N	Pit m^2	Trench N	Trench m^2	Total excavated (m^2)	Stylistic affiliation
Ave Grande	AS/AG/A	450	45	12	10.5	1	33	43.5	Dabajuroid
	AS/AG/B	?	43	2	4	-	-	4	Dabajuroid
Isla Palmeras	AS/IP/A	168	40-55	7	14	-	-	14	Dabajuroid
	AS/IP/B	375	45-50	5	5	-	-	5	Dabajuroid
Curricai	AS/CU	450	45-50	9	12	-	-	12	Dabajuroid
Total		1443		36	49.5	1	33	82.5	

bases. At least one painted vessel in the assemblage was an open unrestricted bowl with shafted annular ring base; another was, probably, a large open bowl of irregular form. A fragment of a liquid-container (necked jar) was painted with parallel horizontal bands of different widths, including a white rhombus painted on a wide red band (Figure 10).

The plastic decoration, combined with painting, is expressed in the form of small protuberances applied to the external walls of shafted annular ring bases and directly on rims tops. Two open bowl rims are decorated with motifs of vertically compressed human faces, accomplished by the techniques of appliqué and incision; both are red slipped in zones (Figure 11). Another rim is similar to the previous one but has owl-eyes-like motifs. It is interesting to note that each of these overall similar decorations has a different row of incisions above the 'face'. Another bowl rim shows a simple biomorphic appliqué.

The lower half of one globular *olla* with everted rim was externally red slipped. Annular bases and vertical strap handles of different sizes were also recovered at this site. The collection is complemented by four fragments of griddles.

The examples of painted 'fine ware' are very scarce in the AG/A assemblage in comparison to the 'ordinary ware' with corrugated rims. The virtual absence of necked jars (liquid containers) is striking.

Vessel forms, decorative techniques and motifs of the pottery recovered in the AG/A site are within the range of variation accorded to the Dabajuroid subseries (Oliver 1989; 1997). Unfortunately, the sherds recovered at AG/A site are of low diagnostic value as indicators of more subtle spatial/chronological divisions within this subseries. The type of painted open bowl with shafted base with a thin (lenticular in cross-section) 'ring' was present in both Túcua and Early Urumaco components, in the Túcua site (Oliver 1989, vol. 2: 442; Appendix-C, Fig. C-32 a to f; Fig. 46 b). The corrugation, annular and low stand ring bases are also common elements of Dabajuroid pottery from Curaçao/Bonaire (Haviser 1987; 1991: 47). Both the form and the typical band design with a series of white rhombus painted on a wide red band on the neck of the necked jar, are typical of the mainland Dabajuran subseries (Oliver 1989, vol.2, Fig. C-59, c17; C-55, 13; 1997).

However, four fragments of rims decorated with motifs of human faces (Figure 11, A-D), are typical decorative traits of the Valencia style (Kidder 1944, Pl. 2: 19, 20). The rim with 'owl-eyes' decoration, is identical to one found in the Cementerio de Tucacas, the westernmost style of the Valencioid series (Cruxent and Rouse 1958, vol.2, Pl. 24: 23), as well as in the La Cabrera site, with its Valencia style assemblage (Kidder 1944, Pl. 2: 28). All these Valencioid rim sherds are definitely dated post a.d. 900. Unfortunately the scarcity of data associated with the small shell midden that yielded the artefacts of the Cementerio de Tucacas style, limits the inferences that can be made about the nature of social/political relationships of the bearers of Dabajuroid/Valencioid pottery in the north western coast, and, in consequence, in the Las Aves Islands. Cruxent and Rouse (1958, vol.1: 148) attributed the mixture of Dabajuroid and Valencioid elements in the Cementerio Tucacas site to undetermined 'marginal contacts' between bearers of these cultural traditions. However, even though the area of Tucacas can be considered as the western periphery of the Valencioid sphere of interaction, does not mark, at the same time, the eastern border of coastal Dabajuroid influence. Dabajuroid-related pottery appears discontinuously along the eastern coast in the Guaraguao, Punta Arenas and Playa Guacuco sites (Cruxent and Rouse 1958). The ceramics from these sites can, probably, be classified as a subseries distinct to the Dabajuran (Oliver 1989). In the Playa Chuao site, in the central-western coast, the Dabajuroid pottery was recovered associated with Valencioid sherds (Morales 1984). The same combination was observed in the Dos Mosquises Valencioid site, in the Los Roques Archipelago.

I consider that the remains of these Valencioid/Dabajuroid contacts in north-central Venezuela are significant and that they can be indicative of (1) a great mobility and trade or (2) occasional social 'fusion' of the marine oriented coastal Dabajuran and Valencian societies. My guess is that during late prehistoric times segments of the bearers of Valencioid and Dabajuroid pottery joined together for certain specialised activities, i.e. the fishing parties, and strengthened their social interaction through intermarriage and/or ritual exchange. The presence of Valencioid sherds in the Dabajuroid assemblage of Ave Grande Island can be considered as a result of some of these undetermined social interactions.

Ave Grande (AG/B)

The site AG/B, called Las Dunas, is located within the area of sand dunes, about 400 m to the south of the beach close to the AG/A site. Only about 75 meters separate the dunes from the border of a large inner lagoon bordered by mangroves, to the south. Among the dunes, contemporary fishermen have excavated several pits in search of brackish but drinkable water; the most important of these pits has water available throughout the year. A few eroded sherds and chitons plaques were recovered from the surface of the site. Several sherds were found clustered on the surface, close to the dunes, and permitted the reconstruction of a big globular cooking and/or storage olla.

The grey coloured soil layer begins about 12 cm below the surface, and the bottom of the cultural deposit was reached on the depth of 45 cm. In these pits the water table level was found in the depth between 120 and 130 cm. At the depth of 43 cm one well preserved hearth of 70 cm in diameter and about 13 cm thick was recovered; it incorporated three lips of adult *Strombus gigas* shells, a great deal of fragments of the same shells, as well as several sherds and fragments of marine turtle carapaces. The sample taken from this hearth was radiocarbon dated to 1260±80 b.p. (I-16,286). In the walls of two water-pits excavated by the fishermen, two other hearths were observed lying at a depth of 10 and 27 cm beneath the surface. Both of them contained charred soil, pottery, charcoal, *Strombus gigas* shell fragments and bone debris. All the hearths were well preserved and their differential vertical distribution, as well as refuse areas associated with them can be indicative of a few short-time reoccupations of the site, probably in search of drinkable water.

The only decorated sherds recovered in this site are four corrugated rims with thumb impressions. These decorations, as well as forms of the 'ordinary ware', can be related to the Dabajuroid assemblage from the nearby AG/A site. However, the final question remains: if the AG/B site was really related to the brackish water exploitation. If so, why were necked jars, the typical Dabajuroid water containers, not recovered neither from this nor from the adjacent AG/A sites? Oliver (personal communication 1997) suggested that the painted necked jar would have been used exclusively as a container for *masato* or manioc beer, while the water could have been transported in light and versatile bottle gourds, in the canoe. The necked jar might also be used as a turtle oil container.

Isla Palmeras (IP/A)

This site is located toward the centre of Isla Palmeras Island, about 170 meters from the eastern shore and 80 m from the small sandy beach on the western shore. About 110 m separate the site from the brackish water source located toward the east. Great amounts of *Strombus gigas* shells, crushed into pieces, emerge on the surface in the form of a shallow bank about 28 m long and one to five meters wide (Figures 12 and 13). A few potsherds are scattered among the shells fragments.

The site was located in 1988 and excavated in 1992. The cultural deposit goes from the surface to the maximum depth of about 45 cm, where the sterile strata begin. Apart from the omnipresent *Strombus gigas* shell fragments and few long turtle bones, other faunal remains include 21 chitons plates and 19 *Cittarium pica* shells.

Stone artefacts include five medium and two large sized hammerstones, two fragments of thin, plain sandstone 'sheets' bevelled on one of their borders, one petaloid axe with polished surface, bevelled edge and with heavy use-wear traces on both working extremities, and 15 small quartzite flakes; the raw material of all these artefacts is of allochthonous origin.

In the main pit (8 m^2) 58 lips separated from shells of adult and old *Strombus gigas* individuals, often deposited in groups of two to six, were recovered. Both the large quantity and the spatial clustering of these lips indicate that they were intentionally separated from the shells *in situ* and, probably, shipped out of the Las Aves Archipelago for further manufacture in the continental and/or insular (Bonaire/Curaçao) permanent Dabajuran villages. At this point I should stress that to separate the lip of the *Strombus gigas* shell it is not necessary to crush a whole shell; this process is quick and simple and no specialised tools are necessary to accomplish it; an adult *Strombus gigas* shell can even successfully substitute for hammerstone during this process, if the former is not available.

If the lip separation process does not account for such a high quantity of small shell fragments in the site, three possible explanations can be proposed to explain it: (1) crushing the shells was a meat extraction technique, (2) the shells were crushed in order to obtain inner columella parts as a raw material, (3) and/or other unknown ideological factors underlied these processes. I favour two last of these hypotheses even though I am fully aware that only new problem-oriented excavations can shed light on this issue (see also Chapter 8). It should be noted that complete shells and their large fragments are predominant in the deeper levels (20-40, 40-60 cm) of the site. In the level 0-20 the quantity of small shell fragments became dominant and they became exclusive on the site's surface. Natural factors can be invoked to account for this phenomenon. Sea waves, for instance, could intrude into the site occasionally, during storms or earthquakes, and can be cautiously suggested as responsible of this 'reverse sieving' effect.

Only two traces of poorly defined hearths were recovered in the IP/A site, both in the same pit, at a depth of 35 cm. This evidence, together with low abundance and diversity of faunal remains, seems to indicate that the site was not a multifunctional campsite where the Amerindians lived, processed their food, and worked out the shells, but rather was a specific purpose site.

Pottery is relatively scarce in the site. It is represented by plain sherds pertaining to medium and large globular and hemispherical cooking ollas, some of them with strap handles and corrugated rims. A few red slipped sherds with 'coffee-bean-eye' appliqué were found scattered on the surface; however, these are of low diagnostic value and can be considered either as Valencia-related intrusions or as Dabajuroid imports.

I should note that the only decorated sherds found in the ILR/A site were also corrugated rims with thumb impressions, as in the IP/A site. This data can be suggestive of a possible cultural relationship between both these sites, despite the low diagnostic value of corrugated rims. Only few plain sherds were associated with the DM/A deposit of crushed shells, leaving open the question whether it can be considered as a part of the Valencioid component that dominates this site, or has an independent cultural affiliation. For now, the scarcity of available data preclude any reliable conclusions from the comparative analysis of these three deposits.

The data suggest that site IP/A was a special purpose campsite of low occupational density, in part, related to rough processing of *Strombus gigas* shells. The occupants of the site may be related to the bearers of the Dabajuroid pottery from the site AG/A. The precise causes and nature of cultural and natural processes that intervened in the formation of this site, and especially its shell deposit, remains to be elucidated.

Isla Palmeras (IP/B)

This site is situated only 55 m from the sandy beach of the leeward coast of the island. Its length is about 75 m by 8 m in its widest parts. Patches of dark grey soil are clearly visible on the surface of the site and semi-buried *Strombus gigas* shells are scattered among the grasses in a strip of about 75 m long and 5-8 m wide. The shells are predominantly whole except for the opening holes in their spires indicating the technique of meat removal.

The cultural deposit begins only a few centimetres below the surface and ends at a depth between 35 and 40 cm. Faunal remains, other then *Strombus gigas* shells, are scarce in this site and include turtle bones, chiton plates and other molluscs such as *Cittarium pica, Codakia orbicularis* and *Strombus costatus*. A few fish spines and vertebrae, as well as two dentaries of *Scarus guacamaya* were also recovered. Although carbonised organic particles are scattered thorough the deposit no defined hearth was located.

The recovered sherds represent medium to large undecorated cooking ollas. The IP/B site can be considered as a typical locus for *Strombus gigas* meat extraction and, probably, processing. I suspect that sites IP/A and IP/B, were not contemporaneous even though their ceramic assemblages were, probably, rooted in the Dabajuroid tradition; the precise chronological and functional relationship between these sites has to remain, for now, undetermined.

Curricai (CU)

Curricai is one of the smaller islands of the Aves de Sotavento group; it is flat, covered by grasses and has a series of dunes along the sandy beach on the southern coast. The site CU/A is situated in the western part of the island, about 10 m from the coast that is well protected by patches of reefs that come close to it. The site was discovered thanks to the routine test pit excavations, since artefacts were not observed on the surface nor did changes in topography, soil colour or vegetation indicate the existence of cultural deposit beneath the surface.

The cultural strata begin about 15-20 cm below the surface and end at a maximum depth of about 45 cm, in the centre of the site. One plain sandstone 'sheet' bevelled on one of its borders, similar to specimens recovered from the IP/B site, was also found. A few sherds and faunal remains are loosely distributed, both vertically and horizontally in the sandy matrix. Turtle remains, chiton plates and *Scarus spp.* mandibular fragments were also recovered. One hearth of about 35 cm in diameter was located at a depth of 40 cm in what seemed to be the central part of the site. The radiocarbon dated sample from this hearth yielded 420±80 b.p. (I-17,219).

Pottery is coarse, and one large open bowl of rough manufacture especially calls attention for its asymmetrical form and thick walls. The only decorative motifs are corrugations with thumb impressions limited to the rims of cooking and/or storage vessels of medium to large sizes. The site can be considered as a low occupational intensity campsite, probably culturally related to the bearers of the Dabajuroid pottery.

Isla del Tesoro (IT/A)

The site IT/A, discovered and excavated in 1985 and re-excavated in 1992, is located on a grassy area toward the narrow central-eastern part of the Isla del Tesoro, in the Aves de Barlovento group (Figure 14). Toward the south, the site is separated by a distance of only 5-7 meters from a shore covered by mangroves; the sandy beach is located 70 m to the north. No cultural remains can be observed on the surface of this site; several nests of booby birds (*Sula* sp.) are scattered on the surface of the site and the uppermost 20 cm are densely covered by *guano*.

The cultural deposit reaches a depth of 57 cm and is composed of scarce sherds, several quartzite flakes, three hammerstones and faunal remains. Turtle bones and carapace fragments, chiton plates, fish vertebrae and three bird bones were recovered. Among 118 shells and their fragments are: 49 *Cittarium pica* fragments (16 MNI), 42 *Strombus gigas* fragments (7MNI), 3 *S. raninus* fragments (2MNI) and representatives of the *Astraea* (14MNI), *Conus* (9MNI), *Fissurella* (5MNI), and *Voluta* (2MNI) genera (Antczak and Antczak 1985; 1988a). Only one premaxillary and two dentary plates of large specimens of *Scarus guacamaya* were recovered in the site. In the absence of small fish remains these evidences indicate that fishing was small scale and rather opportunistic. Bow and arrows and/or spear were used instead of nets and traps to pursue large parrot fishes in the shallow reefs.

Nine lips separated from *Strombus gigas* shells, three of them deposited together and retouched as pre-forms for celts or pendants, and two fragments of shell disks might suggest that small-scale rough shell work was carried out at the site. All these remains are loosely distributed in a greyish sand that contains many carbonised particles.

TABLE 6. *Amerindian sites and excavations in the Archipelago of Las Aves de Barlovento.*

Island	Site code	Site extension m²	Site max. depth cm	Pits N	Pits m²	Trench N	Trench m²	Total excavated m²	Stylistic affiliation
Isla del Tesoro	AB/IT/A	60	57	10	8.5	-	-	8.5	Dabajuroid
Isla del Tesoro	AB/IT/B	340	45	13	23.5	-	-	23.5	Dabajuroid
Isla del Faro	AB/IF/A	250	35	10	10.0	-	-	10.0	undefined
Isla del Faro	AB/IF/B	?	0	-	-	-	-	-	Dabajuroid
Total		920		23	35.5	-	-	35.5	

Some 224 ceramic sherds were recovered, representing medium to large cooking and storage ollas. Pottery is sand tempered and is of rather coarse manufacture; a few of these sherds were over one cm thick. Decoration is absent except for 14 rims that were corrugated with or without thumb impressions; two pedestal bases were found.

Two hearths were recovered in the site; the lower one, rests at a depth of 57 cm, gave the radiocarbon date 420±80 b.p. or a.d. 1530 (I-16,278 [Antczak and Antczak 1993]). The second, shallower, hearth lay at a depth of 38 cm.

The site can be interpreted as a campsite reoccupied through time by small groups of people, probably bearers of Dabajuroid pottery. It is noteworthy that the emphasis on *Strombus gigas* lip separation, presence of corrugated rims, as well as the radiocarbon dates, suggest a cultural/functional link between this site and IP/A, from the Las Aves de Sotavento Archipelago.

Isla del Tesoro (IT/B)

The second archaeological site in the Isla del Tesoro is located about 500 m to the south-west of IT/A. Only few meters separate the site from the sandy beach to the north and from the group of mangroves to the south (Figures 14 and 15). The cultural layer begins between 15 and 20 cm below the surface and reaches sterile at a depth of 45 cm. Ceramic sherds, stone artefacts and faunal remains are loosely scattered vertically and horizontally within the sandy matrix.

Pottery is dominated by fragments of plain cooking and storage ollas; only 22 out of 876 sherds were decorated. Only seven decorated sherds are painted while the rest are corrugated rims with and without thumb impressions. The painting consists of straight parallel wide and fine lines in Black and Red on Buff (natural). One rim of an open bowl is internally painted with a wide band that goes around the vessel and thinner parallel bands disposed perpendicularly to it. On the external side, below the rim there is a small appliqué and two appendixes are applied directly on the rim's top. Another open bowl rim is painted with narrow black bands and the motif of 'inverted T' (compare with Oliver 1989, vol.2: Fig.C-59:13,16); a small 'ear-like' appliqué goes vertically down from the rim's top. A few sherds permitted the reconstruction of an open bowl with shafted annular ring base which had, probably, bands of red paint on both inside and outside. Two vertical strap handles and three fragments of pedestal bases were also recovered. No griddle fragments were found.

Stone artefacts are of low diversity and poor quality, including several quartzite flakes and seven medium sized hammerstones. Two bone artefacts were recovered: one unipoint, probably an arrow head, and a possible spatula made out of a large mammal bone, possibly a deer, bevelled in one of its extremities.

Faunal remains are very scarce; turtle bones dominate the sample followed by 32 fish remains including vertebrae and spines and two mandibular fragments of Scaridae. Shellfish are represented by 42 *Cittarium pica* shells, only a few fragments of *Strombus gigas*, *Arca zebra* and *Chama*, *Codakia* and *Spondylus* species.

Five hearth features with diameters varying between 35 and 65 cm were recovered at depths between 32 and 40 cm; four of them were concentrated in an area of about 2 m². The relatively narrow range of the vertical hearth distribution, as well as their spatial horizontal clustering suggest that this site was not as frequently reoccupied over a long time as other insular sites were; given its size, it also seems to had been occupied by a very small group of persons, perhaps by one canoe crew.

All painted sherds from the IT/B are related to the Dabajuroid subseries. This relationship is indicated, for example, by the painted rim with appliqué which is very similar to the mainland Dabajuroid specimens, especially Urumaco style/complex (see Oliver 1989, vol.2, Fig. C-63k, C-67M, C-17). The forms, especially the bowls with shafted annular ring base, have also their 'twin' counterparts within the Dabajuran subseries from the mainland (Oliver 1989; 1997), as well as within Dabajuroid ceramic assemblages from Bonaire and Curaçao (Haviser 1991).

Isla del Faro (IF/B)

This site is situated adjacent to the tiny sandy beach on the northern, leeward coast of the island. This beach is one of two or three natural openings in the line of mangroves that today cover the major part of the north-eastern coast. These openings permit the access to the interior of the island. Only few small and heavily eroded sherds were observed on the surface of this site.

The dimension of the cultural layer is poorly defined; it starts about 10-15 cm below the surface and ends at a depth of 30-35 cm. Artefacts, mainly ceramic sherds, are scattered loosely both horizontally and vertically. The ceramic assemblage is represented by 67 plain sherds corresponding to medium and large cooking/storage ollas and only three sherds are decorated with corrugated rims. Hearths were not recovered; however, grey-coloured patches of sand, containing small carbonised particles, may suggest their original existence in the site. This ephemeral site can be tentatively related to the Dabajuroid sites from the Isla del Tesoro.

Tracking Dabajuroid 'connections'

Cruxent's and Rouse's Dabajuro style (1958) was redefined by Oliver (1989) into three different ceramic complexes or styles: Túcua (a.d. 800 to 1100/1200), Urumaco (a.d. 1100/1200 to 1400/1450), and Los Médanos (a.d. 1350 to 1600/1650), in the core area of modern Falcón State. Of these, the Urumaco complex partially encompasses the original 'Dabajuro style' defined by Cruxent and Rouse. According to Oliver, between a.d. 850 and 1350 the Dabajurans rapidly expanded across coastal Falcón and by Early Urumaco times (a.d. 1200-1350) the islands of Aruba, Curaçao and Bonaire were already colonised (Oliver 1989, 1997a; see Haviser 1987, 1991; Versteeg 1993)]. In Aruba Island, the styles designated as Santa Cruz at Tanki Flip (du Ry 1960) and the succeeding Savaneta style are in close stylistic relationship (if not equivalent) to the mainland's Urumaco and Los Médanos styles (Oliver 1989, 1997a). The archaeological, as well as the ethnohistoric data indicate close relationships between the Dabajurans from Aruba Island and the homeland in the coastal Falcón (Oliver 1989; 1997b).

To the east of Aruba, on Curaçao and Bonaire Islands, the Dabajuroid ceramics are somewhat more divergent stylistically from mainland and Aruban pottery (Oliver 1997). Haviser (1987; 1991) suggested that between a.d. 400 and 500 these islands received bearers of a pottery of a pre-Dabajuroid tradition, represented by the Wanapa/De Savaan styles of pottery, which he portrayed as unique to Bonaire/Curaçao islands. The painting traits, identified by Haviser as 'unique' to De Savaan style are 'painted dots (of red and brown), and alternate colour parallel-line patterns (most often two red lines bordered by two black or brown lines) both painted on a buff background' (Haviser 1991: 50; Fig. 24 a, b; 25). Largely on this basis Haviser (1991: 54, 61, 65) argued for a pre-Dabajuroid early ceramic tradition in Bonaire/Curaçao deriving from the Ocumaroid series. He speculates that about a.d. 400-500 the Ocumaroid spread from the coast of Venezuela into the area of the Tocuyo/Aroa/Yaracuy river outlets and, from there, toward the islands (Haviser 1991: 65).

Oliver (1997b) challenged Haviser's explanations about the origin of the Curaçao/Bonaire pottery, as well as the derivation of the De Savaan (Curaçao) and Wanapa (Bonaire) styles from the Ocumaroid series. He argued that the De Savaan-Wanapa styles show only a slight divergence from the known Dabajuroid ceramics from the mainland and Aruba Island, and both, unmistakably, pertain to the Dabajuroid ceramic tradition. Oliver (1997b) hypothesised that the De Savaan-Wanapa styles are probably a result of an initial settlement of Curaçao/Bonaire from some unidentified sector of the Eastern Falcón. However, the crucial element in Oliver's discussion regards the date of the Wanapa style appearance in Bonaire Island, as proposed by Haviser (1991), rather than this style's spread direction. Oliver (1997: 397, footnote 203) suspects that the radiocarbon date of 1480±25 b.p. obtained by Haviser (1991: Fig. 27) in the Wanapa site could rather be of pre-Dabajuroid origin while the date 505±35 b.p., obtained from the sample within the same block area excavation, is related to Dabajuroid deposit. He argued that both samples cannot be related to Dabajuran deposits since 'the ceramics at Wanapa do not show the kind of stylistic and developmental changes that would be expected in 975 years of purported Dabajuran occupation at this site' (Oliver 1997: 397).

The above debate is pertinent to the discussion of the archaeology of the Las Aves Archipelagos and other offshore Venezuelan islands, since Haviser (1991: 53) stated that the only ceramic similarities noted among the Las Aves/Los Roques islands, are with those purported 'earliest ceramic styles' of Bonaire, especially Wanapa style. He suggested that the pottery from the Domusky Norte island, classified as Ocumaroid, (Colmenares 1990; Antczak and Antczak 1991) had an 'early component' linked to the pottery of the Wanapa style from Bonaire (Haviser 1991: 65). He further argued that this 'early component' could be indicative of an early Ocumaroid movement that in about a.d. 500 reached Los Roques, Las Aves, Bonaire and Curaçao islands from the Caribbean coast at the Tocuyo, Aroa, Yaracuy outlets area (Haviser 1991: 200).

Haviser's interpretations do not fit the archaeological data from the Venezuelan offshore islands. The Las Aves de Barlovento ceramic assemblage, according to our data published before 1991, yielded no other diagnostic traits than the corrugated sherds (Antczak and Antczak 1985; 1988a). In consequence, these could not be stylistically related to the painted pottery of the Wanapa and De Savaan styles, as suggested by Haviser (1991). New excavations in the IT/A site, as well as the discovery of a new (IT/B) site in the same Isla del Tesoro, yielded some painted pottery whose stylistic analysis thoroughly confirmed the Dabajuroid affiliation of both assemblages. It has also been said (Antczak and Antczak 1991), that the Aves de Barlovento (IT/A) pottery was associated with the radiocarbon date of 420±80 b.p. or a.d. 1530. This date suggests that, whatever the route the Amerindians navigated to arrive at the Aves de Barlovento islands (from Curaçao/Bonaire or from the mainland; we suggested both possibilities in 1985; 1988a), they were present in the IT/A site during the late prehistoric and/or early-protohistoric times. The same routes were suggested for the occupants of Las Aves de Sotavento (Antczak and Antczak 1988a; 1989a; 1989b; 1989c). Two radiocarbon dates from the Aves de Sotavento Archipelago: 690±80 b.p. or a.d. 1260 (AG/B site) and 420±80 or a.d. 1530 (CU/A site) may indicate a post a.d. 1180 origin for all the Dabajuroid sites in both Las Aves Archipelagos. A possible chronological indicator, derived from the insular pottery analyses, should also be mentioned. Oliver (1989) observed that toward the Spanish Conquest the mainland Dabajuroid ceramics underwent a decline in quality and in designs and decreased in variety; the hollow rims which are typical of earlier Dabajuran Urumaco complexes from the mainland (Oliver 1989) are absent in the Las Aves assemblages. This may be further evidence supporting the late prehistoric origin of the insular Dabajuroid assemblages.

According to Oliver (1989) the Dabajuroid vessels related to cooking and storage ('ordinary ware') were more resistant to change then the so-called 'fine ware' (serving vessels and ritual vessels). Analysing the variability within and between 'ordinary ware' from the Las Aves Archipelagos assemblages, little, if any, changes in their forms and ceramic quality can be observed during the ca. 350 years of the Dabajuran 'permanence' in the Las Aves islands. Discarding the utility of 'ordinary ware' as a sensitive marker of subtle chronological/cultural differences within and between the insular Dabajuroid assemblages, and given the scarcity and low diagnostic value of painted sherds ('fine ware') recovered in the islands, any attempt to determine whether or not the ceramic assemblages from both Las Aves Archipelagos constitute a distinct sub-series within the Dabajuroid series (see Oliver 1989; 1997a), remains open to debate.

The presence of Dabajuroid pottery at a few sites in the Los Roques Archipelago was previously noted by Antczak and Antczak (1991), but these sherds were never described in any detail. Dabajuroid painted sherds, as well as, possibly, Dabajuroid corrugated (coiled) rims, with or without thumb impressions, were recovered within the Valencioid components in the Dos Mosquises (DM), Cayo Sal (CS/D) and Cayo de Agua (CA/A) islands. They were also found within the Ocumaroid assemblage, in the Domusky Norte site (DMN), as well as at site IL/A, which is stylistically unaffiliated. The presence of Dabajuroid sherds in Valencioid and Ocumaroid deposits is indicative of interaction between the bearers of these ceramics, interaction whose origins can be traced to the mainland. However, within the assemblage of the unaffiliated site IL/A, where the only decorated sherds found were the corrugated rims, the possibility of direct presence of Dabajurans, may also be considered.

It must be stressed at this point that, even though the corrugated rims are numerous thorough the majority of the Dabajuroid sites, they are also widespread in non-Dabajuroid sites, in and beyond western Venezuela. Assuming the non-diagnostic nature of corrugation within the Dabajuroid subseries, the translation of its spatial distribution into specific types of intersocietal interaction is, for now, unreliable. Why, then, are the assemblages from the sites AG/B, CU/A, IP/A, IP/B, IF/B, IT/A, all of them located in the Las Aves Archipelagos, considered as related to the Dabajuroid Sub-tradition despite the fact, that the corrugated rims are the only decorated sherds recovered in these sites? This tentative affiliation is postulated on basis of overall similarities in pottery forms and composition, structure and content of cultural deposits, chronology and geographical circumscription of all these sites.

In conclusion, the data indicate that bearers of the Dabajuroid pottery from north-western Venezuela and/or Bonaire and Curaçao Islands, were temporary visitors to the islands of the Las Aves de Sotavento and Barlovento Archipelagos. Their presence is documented from a.d. 1180 to early 16th century. If some of these Amerindian groups were visiting the Las Aves islands during the Conquest period, as suggested by radiocarbon dates, contact with the Conquerors must have been non-existent or, at best, ephemeral, since European artefacts are absent at the insular sites.

Valencioid assemblages

The Los Roques Archipelago 'monopolises' 83% (N=5) of insular sites that yielded pottery related to the Valencioid series; the only other Valencioid assemblage located outside this archipelago comes from the La Orchila Island. Los Roques Archipelago also yielded one Ocumaroid assemblage and 21 sites of stylistically undefined assemblages. Detailed data regarding the characteristics and comparative analyses of the Los Roques ceramic assemblages are discussed in Marlena Antczak's PhD thesis, in progress.

Dos Mosquises (DM)

The tiny Dos Mosquises Island, located on the western periphery of Los Roques Archipelago, yielded the most complex archaeological site and artefactually richest assemblage of all 47 insular sites surveyed and/or excavated during the present project (Figure 24).

Dos Mosquises site (DM/A) is composed of two types of deposits of different structure and content: (1) Valencioid deposits in and around the Trenches A, B, C, E and F, (2) the *Strombus gigas* shell heaps in, and around, Trench D (Figure 30). These deposits are separated horizontally and the shell heaps areas are stylistically undiagnostic.

Two samples taken from hearths in Trench C and one from the hearth in Trench B, were radiocarbon dated. The dates obtained are consistent: 520, 470 and 490±80 b.p. or a.d. 1430, 1480 and 1460 (Table 4). The fourth sample was taken from the hearth that lay at a depth between 49 and 43 cm, in a test pit DM/A/1K, located about 70 m to the north-east from the Trench C. It yielded the date 680 ± 80 b.p. or a.d. 1270. The cultural deposit between the Trench C and the pit is discontinuous and a shallow *Strombus gigas* shell midden (Trench D area) is situated between them (Figure 30). The shell midden and the deposit recovered in the Pit 1K are separated by an archaeologically sterile gap of approximately 25 metres.

Eight plain (undecorated) potsherds, several *Strombus gigas* and four *Cittarium pica* shells and their fragments, as well as turtle bones, were recovered in test Pit 1K. The pottery is tempered with quartz and mica and the sherds' surfaces are rough, like the Valencioid pottery from the adjacent trenches; however, these are not sufficient elements to consider this pottery as a Valencioid series-related assemblage. In consequence, I regard this deposit as a stylistically undefined, probably 'pre-Valencioid' assemblage (see Chapter 8 for further discussion of this deposit).

TABLE 7. *Amerindian sites and excavations in the Los Roques Archipelago.*

Island	Site code	Site area (m²)	Site max. depth (cm)	Pit #	Pit m²	Trench #	Trench m²	Total excavated (m²)	Stylistic affiliation
Rabusky	RA/A	500	45-70	2	2	-	-	2	undefined
Rabusky	RA/B	?	?	1	1	-	-	1	undefined
Isla Larga	ILR/B	126	45	2	2	-	-	2	undefined
Isla Larga	ILR/C	225	45-50	2	2	-	-	2	undefined
Espenky	ESN/A	204	45-48	2	2	-	-	2	undefined
Espenky	ESN/B	?	0	2	2	-	-	2	undefined
Cayo Sal	CS/E	?	40	2	2	-	-	2	undefined
Cayo de Agua	CA/A	350	50	2	5	-	-	5	Valencioid
Cayo de Agua	CA/B	?	0	3	5	-	-	3	undefined
Madrysky	MA	250	30-35	3	3	-	-	3	undefined
Noronky	NO	100	45-50	3	3	-	-	3	undefined
Isla Larga	ILR/A	500	34-43	3	3	-	-	3	undefined
Nordysky	NR	?	20	3	3	-	-	3	undefined
Boca de Cote	BC	500	25-30	3	3	-	-	3	undefined
Isla de Loco	IL/A	450	25	3	3	-	-	3	undefined
Mosquitoquí	MO	?	5-7	3	3	-	-	4	undefined
Francisky	FS	100	40-45	4	4	-	-	4	undefined
Gran Roque	GR	600	35-40	4	4	-	-	4	undefined
Cayo de Agua	CA/C	?	30	2	4	-	-	4	undefined
Punta Cuchillo	PC	450	15-20	4	4	-	-	4	undefined
Isla de Loco	IL/B	?	0	4	4	-	-	5	undefined
Cayo Sal	CS/C	350	65-70	5	5	-	-	6	Valencioid
La Pelona	PL	?	39	3	6	-	-	6	undefined
Cayo Sal	CS/D	400	37-70	6	6	1	37	39	Valencioid
Krasky	KR	365	25-45	2	2	1	44	46.5	Valencioid
Domusky Norte	DMN	700	65-75	10	2.5	1	34	83	Ocumaroid
Dos Mosquises	DM	750	45-55	43	49	6	421	470	Valencioid
Total		6920	43.34	126	134.5	9	536	714.5	

Cayo Sal (CS/D)

This site is situated close to the western edge of Cayo Sal, the longest (ca. 12 km) island in the Los Roques Archipelago (Figure 25, 68 and 69). This island is a southern barrier of the archipelago and its southern coast is almost inaccessible for boats due to strong waves and dense coral colonies living close to the shore. The northern coast of the island is covered by mangrove swamps except for its western edge where the shore is sandy and open to the shallow inner waters of the archipelago. The western part of the island is occupied by a series of interconnected shallow lagoons that are natural salt pans, well known and exploited in historic times (Humboldt 1941[1814-1825]; Codazzi 1960; Spence 1966[1871]). Site CS/D is located on a narrow strip of land; it is 10 meters distant from the quiet sandy beach to the north and, to the south, it lies directly on the northern shore of the westernmost of the inner lagoons. To the west, at a distance of only a few meters, begins a series of heaps composed of millions of *Strombus gigas* shells. Given the proximity of this midden to the site CS/D, additional research is imperative to determine whether or not any cultural and functional relationships exist between both sites. The existence of such links is, for now, unproved and in consequence, I am obliged to consider the mega-midden site (CS/E) as independent from the CS/D site, and stylistically undefined.

The cultural deposit in the CS/D site started about 10 cm beneath the surface and reached 40 cm in depth at the northern and 75 cm in the southern part of the trench, where it sloped to the lagoon. The water table level was found at a depth of 48 cm beneath the highest point of the site. In consequence, toward the shore of the lagoon, the excavation proceeded below the water table level where a few sherds and quartzite flakes were still found. No defined hearth features were found within the trench; however, numerous carbonised particles scattered throughout the deposit may suggest that hearths had originally existed in this site. Their integrity may have been affected by the seasonal changes in the water table level and/or by flooding of the hypersaline lagoon into the site area.

The radiocarbon sample, dated 750±100 b.p. or a.d. 1200, was taken from the only relatively well preserved hearth that was recovered in a test pit situated only five meters south-east from the trench, at a depth of 35 cm (Figure 68). The cultural deposit is continuous between the trench and the pit and, sherds, quartzite flakes and animal remains found in the pit had their counterparts in the trench. Despite the continuity of the cultural deposit I am not suggesting that the radiocarbon date obtained from the pit also dates the assemblage of decorated pottery from the trench, which gave the basis for the discrimination of the Cayo Sal style. With confidence, this style can be dated to a.d. 1200 or later.

The potsherds recovered at the CS/D site were heavily eroded by the proximity of the hypersaline lagoon. The sherds are very coarse, and the painting, which is preserved on a few of them, may have been washed out from several others. The great number of semi-complete and whole vessels, predominantly medium sized cooking ollas with everted rims, is striking. They are followed in number by necked globular jars. A few fragments of manioc griddles were also found. Plastic decoration includes small appliqué on the walls and rims of the ollas, and 'coffee-bean-eye' motifs applied to jar necks. One small globular double-spouted pot and few human figurines were also found. The specific configuration of Valencioid stylistic traits mixed with Dabajuroid painting showed by the CS/D site assemblage induced the formulation of a new member of the Valencioid series, the Cayo Sal style (see Marlena Antczak PhD. thesis, forthcoming).

A few non-ceramic elements recovered at the CS/D site were also found in typical Valencioid sites in Los Roques Archipelago. They include pendants of *Labyrinthus plicatus* and modified *Plekocheilus* sp. land shells. Both shells were brought from the mainland and were found in the site CS/C, located only 700 meters to the east from the CS/D site, as well as in the DM/A and KR/A sites. Deer bone flutes found in CS/D were also recovered in the DM/A site. The large numbers of quartzite flakes and high frequency of semi-complete medium sized ollas with everted rims, have no counterparts in other Los Roques sites.

Two clusters of artefacts recovered in this site attract attention for their singular characteristics. In the central part of the trench several whole and broken medium sized ollas, small open bowls with annular bases (a few of them decorated), as well as three deer bone flutes, were recovered. All these artefacts surrounded a centrally located skull of a large green turtle (*Chelonia mydas*). Two human figurines, three medium size round beads made out of *Spondylus sp.* and *Strombus gigas* shells, one 'pearl' of *Strombus gigas*, a fragment of polished petaloid stone axe, and three fragments of griddle, were found within a radius of 1.5 m from the centre of the cluster. It should be stressed that turtle skull remains were also recovered in DM/A and DMN/A sites; however, the latter skulls were never whole and were always found in refuse areas.

About two meters to the west from this cluster of artefacts, another interesting context was found. This was composed of one 32 cm long beak of the white marlin (Istiophoridae, probably *Tetrapturus albidus*), cut off in its base. Alongside were recovered several minor fragments of other beaks belonging to smaller individuals of Istiophoridae, some of them showing clear evidence of being modified in their bases. Associated with these bones: one human clay figurine, a *Labyrinthus plicatus* land shell pendant, and several long bones of large marine turtles, were recovered. Numerous fragments of cooking ollas were found accumulated in the southern part of this cluster, toward the shore of the lagoon. Both the context with the turtle skull, as well as that with marlin beaks, perhaps, maybe interpreted as offering contexts with votive artefacts which were presented by the Amerindians to the spirit protectors of marine animals (turtles, fishes). The radiocarbon date suggests that the bearers of the Cayo Sal style pottery can be cautiously considered as an avant-garde of the Valencioid pottery bearers in the Los Roques Archipelago. I guess that the Cayo Sal style can be viewed as a result of intersocietal 'fusion' by means of which a certain fraction of the Dabajuroid people may have been 'introducing' a segment of Valencioid people into seafaring affairs; however, as suggested by Oliver (personal communication 1997), the opposite can also be argued.

Cayo Sal (CS/C)

This site is situated on the northern shore of the inner lagoon, about 700 meters to the east of the CS/D site (Figure 25). The direct access to the site from the northern coast, the only place where Amerindian canoes could land safely, is presently 'closed' by ca. 15-20 m wide strip of mangrove swamps. I presume that at the time when the Amerindians first arrived to this island, the access to the site from the northern coast would have been unrestricted. It is difficult to accept that thousands of *Strombus gigas* shells would have been transported to the site through the mangrove swamp to extract the meat and discard them on the shore of the lagoon.

In the mid 19^{th} century drawing that depicts precisely the western part of Cayo Sal, the northern coast is still represented 'open' and free of mangrove swamp (Spence 1966[1871]). I hypothesise that the mangroves came to close the access to this part of the coast after the Amerindians abandoned the site. During the 18th and 19th centuries these mangroves could have been heavily affected by activities related to salt exploitation, vegetal carbon and lime production and/or extraction of firewood for steam ship fuel (see Antczak and Antczak 1986b;1988c), to such extent that they are not present in the mid 19th century drawing. During the last 50 years the mangrove community of the north-western coast of Cayo Sal regained its pre-eighteenth century extension. However, if the mangrove strip had been closing the shore in prehistoric times, the question why the Amerindians had selected such a troublesome place to process thousands of heavy shells, is still open to debate.

The central part of the site is occupied by a low midden of *Strombus gigas* shells that were discarded after the meat removal (punched-hole technique). The archaeological deposit starts from the surface and continues to 55 cm in the deepest parts of the site. Apart from the omnipresent *Strombus gigas* shells and potsherds, one fragment of polished stone adze, a land shell pendant (*Labyrinthus plicatus*), as well as two hammerstones and few quartzite flakes were recovered from the pits. The faunal remains were rather scarce and include 26 *Cittarium pica,* five *Melongena melongena*, several *Strombus raninus* and *Strombus costatus* shells, as well as, turtle bones, unidentified fish vertebrae and chiton plates.

The pottery is represented almost exclusively by fragments of cooking/storage globular ollas with everted rims and by necked jars. A neck of one small sized globular jar is decorated with appliqué of a human face and few fragments of large necked jars are decorated with appliqué of coffee-bean-eye motifs. Several red slipped necked jar fragments were also found. These stylistic traits link this assemblage to other Valencioid pottery from Los Roques Archipelago.

Cayo de Agua (CA/A)

This site is situated toward the north-eastern edge of the Cayo de Agua island, about 10 meters from the sandy shore (Figure 25). The northern part of the site extends into the adjacent mangroves that surround the small inner lagoon. No archaeological material was observed on the surface of the site.

The cultural deposit begins about 10-15 cm beneath the surface and reaches the depth of 45-50 cm in the main pit of 3 x 1 m. No defined hearths were found in this pit; however, patches of dark grey soil and numerous carbonised particles scattered thorough the deposit may suggest their original presence. The faunal remains include a few *Strombus gigas*, *Chama* spp., *Astraea* spp. and *Cittarium pica* shells, turtle bones and carapace fragments, chiton plates, unidentified fish vertebrae and three dentaries of Scaridae. One hammerstone and two quartzite flakes were also recovered.

The pottery is almost exclusively composed of undecorated fragments of cooking/storage ollas. Two rims of necked jars were red slipped and decorated with appliqué of 'coffee-bean-eye' motifs. One fragment of 'collared' jar shows a double line of punctations. One frog motif was applied to a small vessel rim. Similar specimens were recovered in DM/A and KR/A sites, as well as in El Topo and Las Minas Valencioid sites, in the Cordillera de la Costa (Cruxent and Rouse 1958, vol. 2, Pl. 36; Fig. 147, 10). The CA/A pottery is tentatively considered as a Valencioid-related assemblage. However, more excavations should be done to confirm or refute this affiliation.

About 15 metres to the north of the main pit one test pit was excavated among mangrove trees. It yielded three corrugated rims with thumb impressions and few turtle bones and fish vertebrae, at a depth between 40 and 52 cm. Given the paucity of the sample and spatial discontinuity between the deposits of the two pits the stylistic/chronological relationship between them is, for now, unknown.

Krasky (KR)

Krasky Island is located in the central part of the Los Roques Archipelago and the archaeological site is situated about 100 meters from the sandy beach on the south-western coast (Figure 25). The site is partly covered by fishermens' huts and their refuse areas. I should underline that the modern settlements in Krasky and Gran Roque Island are the only permanent settlements in the Los Roques Archipelago, and their occupational history goes back to the beginnings of the 20th century (Loy Gómez, Amanda Marcano, Teobaldo Salazar, personal communication 1982-83).

The excavations were carried out in the area where Mrs. Amanda Marcano, the owner of the household nearest to the site, had casually found ceramic sherds and figurine fragments. By comparing the data published by Jam (1956) with the information we were given by Amanda Marcano and Loy Gómez (personal communication 1983), we concluded that the pits excavated by Jam in the 1950s and the trench excavated during the present project were situated in the same site.

Several sherds and two fragments of figurines were collected from the surface of the site; they had been previously dug out by the fishermen. Amerindian artefacts were found to a depth of 45 cm, within the trench; however, several eroded metallic and glass fragments were also recovered from every level of the deposit. Assessing the origin and/or estimating the date of the non-Amerindian remains I concluded that they were deposited in the site since the second half of the 19th century. The deposit shows several tiny and compact soil lenses which are vertically and horizontally discontinuous. Some of them are whitish and composed of sand and lime, others are black in colour with a high content of carbonised wood particles. Both features are probably remains of 19th or early 20th century activities linked to lime and vegetal carbon burning (see Antczak and Antczak 1986b). Not a single hearth was recovered in the site and due to the post- depositional anthropic alteration of its structure it is not possible to determine whether or not they were originally present.

Given this anthropic alteration, my attempts to disentangle the genuine Amerindian from non-Amerindian faunal remains was largely impracticable. Animal remains were scarce and, apart from marine organisms, a few fragments of modern pig and cattle bones were recovered even from the deepest levels of the cultural deposit. In consequence, I decided to exclude almost all faunal specimens from the present analyses. Uniquely, two modified *Strophocheilus spp.* land shells and one *Tivela mactroides* pendant were undoubtedly brought by the Amerindians from the mainland and deposited in this site; similar specimens were also recovered from DM/A, CS/C and CS/D Valencioid deposits.

In conclusion, neither contextual information nor a datable radiocarbon sample could be obtained in the Krasky site, even though these were precisely the main reasons for undertaking this site excavation. Such pottery characteristics as mineral temper, rough surfaces, external red slip, punctated bands around bottle necks, 'coffee-bean-eye' and frog motifs appliqué, human figurines, and forms of globular ollas with everted rims and necked jars, confirm inclusion of the KR/A site assemblage into the Valencioid series.

La Orchila (OR/F)

The locality called Los Mangles is situated in the north-eastern coast of La Orchila Island (Figures 16 and 17). Site OR/F is located in the Los Mangles locality, only five meters distant from a well protected sandy beach (Antczak 1993). Just to the north-east of this site stretches the area of low sandy keys, surrounded by shallow waters, numerous reefs and sandy banks.

The excavation in the main trench revealed a cultural deposit that begins about 15-20 centimetres below the surface and reaches the depth of 60-70 cm. This deposit includes potsherds, stone, bone and shell artefacts, faunal remains and hearths.

Lithic artefacts were scarce; five hammerstones, one fragment of polished axe and several small quartzite flakes without traces of use wear, were found. One mammal bone unipoint and one bipoint and two pendants made out of the *Tivela mactroides* shells, perforated below the umbo, were also recovered. Faunal remains include numerous *Strombus gigas* shells, other mollusc shells, turtle and fish bones and fish otoliths (see Chapter 8).

Six hearths were recovered at a depths between 45 and 65 cm beneath the surface. Five of them, with diameters ranging between 30 and 45 cm, were situated one on top of another, in two adjacent square meters. The evidence seems to indicate that the site was reoccupied, even though

TABLE 8. *Amerindian sites and excavations in the La Orchila Islands.*

Site	Site code	Site extension (m²)	Site max. depth (cm)	Pits #	Pits m²	Trenches #	Trenches m²	Total excavated (m²)	Stylistic affiliation
Los Mangles	O/OR/F	300	70	4	4	1	15	19	Valencioid?
La Laguna	O/OR/H	150	15	1	1	-	-	1	undefined
Cayo El Dorado	CED/A	60	20	1	2	-	-	2	undefined
Total		510		6	7	1	15	22	

no defined cultural layers, associated with particular occupations, could be distinguished in the soil matrix. A sample for radiocarbon dating was taken from one hearth that lay at a depth of 63 cm; it gave the date 580±80 b.p. or a.d. 1370.

The majority of potsherds are plain and represent open, unrestricted bowls and medium sized cooking/storage globular ollas with everted rims. Decoration is a combination of appliqué, punctation and incision. This combination is well represented on a bulging neck of a globular jar with a tall outcurved rim, which is decorated with a human face with 'coffee-bean-eyes' and mouth; a double line of punctations surrounds the neck's base (Figure 19). The form and decoration of this vessel can be matched among the Valencia Red bulging jars recovered by Kidder (1944: 63-64, Fig. 21) in La Cabrera Peninsula of Lake Valencia; however, none of Kidder's jars had such a neck and pronounced outcurved rim as the specimen from OR/F site. Tall jar necks with outcurved rims have also been recovered in the Río Chico Valencioid site (Cruxent and Rouse 1958, vol.2, Fig.76.9 a); however, they lack the bulge which is typical for the Valencia style jar necks.

One sherd found at OR/F site shows two pellet-like protuberances applied to its external side. Another decorated sherd is a modelled/incised rim lug adorno representing a zoo- or anthropomorphic face. Similar adornos were found at three other sites, each of them in a different insular group: BC/A (Los Roques), AG/A (Las Aves) and TR/A (La Tortuga). All these sherds are similar to the decorated sherd recovered by Osgood and Howard (1943, Pl. 5, L) at the Guaraguao site in the Barcelona area, in the eastern Venezuelan coastal area (Anzoátegui State). They can also be related to the El Topo Valencioid style from the mountains of north-central Venezuela (Cruxent and Rouse 1958, vol. 2). Cruxent and Rouse (1958, vol.1: 199) considered the Guaraguao ceramic assemblage as belonging to the Dabajuroid series; however, they also indicated the presence of certain Valencioid traits within this assemblage. Vertical rod-like handle fragments recovered in OR/F can be related to similar specimens found in such Valencioid sites as El Topo and Las Minas, in north-central Venezuela Cruxent and Rouse 1958, vol.2: Pl. 36, 18-20; Fig. 147, 2). They are, however, most strikingly similar to specimens of the Río Chico Valencioid style from the central-eastern coast, which are composed of one to three rods (compare with Cruxent and Rouse 1958, vol. 2: Pl. 38.8; vol.1: 188). It should be stressed that uni- and multiple-rod handles were also reported from a few non-Valencioid sites from western Venezuela (Cruxent and Rouse 1958).

Given the overall characteristics of the ceramic assemblage, the OR/F site can be placed within the Valencioid series. Furthermore, it may be viewed as a participant of a stylistic development localised in the Río Chico area, that centred in the eastern periphery of the Valencioid sphere of interaction (see also Nieves 1979; 1980; 1983; 1992). However, the Arauquinoid stylistic traits, which some authors suggest 'contributed' to the upsurge of the Valencioid series (Rouse and Cruxent 1963: 100, 147; Tarble: 1985; Vargas 1990: 230), would have evolved or survived 'differently' in the Río Chico area than in the Valencia Basin. Particularly, the iconographic composition of the human effigy found in the OR/F site is, in my opinion, much more related to the Arauquinoid pottery (compare Cruxent and Rouse 1958, vol. 2, Pl. 76, 1-4) than to the Valencia style representations of human face. It seems particularly related to human effigies applied to the necks of composite-silhouette jars recovered in the Corozal Middle Orinoco site (compare with Camoruco I and III phases, a.d. 700-1500 in Roosevelt 1980, Fig.69). These composite-silhouette jars have had very long tradition in the Middle Orinoco area (Roosevelt 1980, Fig. 89). It can be speculated that, during the late prehistoric time, the Río Chico cultural area might have been exposed to more regular and direct Arauquinoid influences that were spreading from the Middle Orinoco through the eastern plains. The bearers of the Río Chico pottery would have been the westernmost members of wide interregional system that linked the Middle Orinoco with the north-eastern coast (Arvelo Jiménez and Biord 1994). The pottery from the OR/F site in La Orchila Island may be interpreted as an example of consistent Middle Orinoco cultural influences on the Río Chico area. Nieves (1992: 163) suggested that the Arauquinoid people penetrated the Valencia Basin from the Middle Orinoco plains and from there, through the Serranía del Interior, they expanded to the Río Chico area (*llanada barloventeña*). I agree that the first movements of Arauquinoid people to the north would have happened as proposed by Nieves. However, I suggest that once the Valencia style developed, the Arauquinoid influences into the Valencia Basin would have ceased, or the intersocietal interaction (Arauquinoid/Valencioid) might have taken quite different form and intensity than that established between Arauquinoids and the societies from the Río Chico area.

Stylistically undefined assemblages

La Tortuga Island

Seven sites in La Tortuga island yielded small surface collections of potsherds. Collections from such sites as TR/A1, TR/C, TR/D and TR/F include only plain potsherds, precluding their stylistic affiliation (Figure 20). Only for sites TR/A1 and TR/D can a possible stylistic affiliation of the potsherds be tentatively suggested. Two painted sherds were collected at the TR/E site, close to small lagoon densely populated by oysters (*Crassostrea rhizophorae*). These sherds were painted with parallel straight and curved red bands on buff and can be related to the Dabajuroid series. Two sites TR/D and TR/F are situated close to a series of 'holes' of diverse depth created naturally in the limestone bed rock. During the rainy season the rain is retained in these 'holes' and can last for long weeks, depending on the capacity and depth (Eustiquio Salazar, Juancho Salazar, personal communication 1992, 1996). Except for TR/F, all sites are located a short distance from the shore (x<200 m).

Los Hoyos (TR/F)

This site is about 1.5 km distant from the coast and it is characterised by a series of 'holes' of different depths formed naturally in the calcareous bedrock. A few patches of ashy soil were found among the scrub a short distance from the 'holes'. Scarce plain potsherds and few quartzite flakes were recovered there to a depth of 15-20 cm. The recovery of these remains close to the water-holes suggests that the Amerindians might have known and exploited these water sources. It is noteworthy that, given the monotony of the interior topography of the island, even the present day fishermen have difficulties finding this site. This might suggest that the Amerindians were exploring and penetrating the interior of the island frequently.

Thus far this is the only inland site located among all Amerindian sites found outside the central Venezuelan coast. Another inland site is also situated in proximity to a natural rain water deposit but toward the east, in La Blanquilla Island, about 100 km to the north of Margarita Island. A huge calcareous rock that retains rain water in its natural pool-like concavities was located in the site called Piedra de la Iguana, about 2 km inland from the south-western coast of this island. Abundant late prehistoric and colonial potsherds, as well as shallow hearth features, were scattered around this rock (see Antczak and Antczak 1991a; 1993: 69). Both sites are suggestive of the explorations of the interiors of the islands by the Amerindian visitors.

Punta Delgada (TR/A)

This site is located about 200 m from the shore in the area of sand dunes. In this site some human bones came to the surface, due to the movements of the dunes, about 10 years ago. The fishermen collected the bones and re-buried them in a plain tomb putting a wooden crucifix on a top of it. The ceramic vessel was found, in inverted position, during the diggings for the re-burial, in close association with the human bones (Eustiquio Salazar, personal communication 1992). In 1992 and 1996, about 50 plain, eroded potsherds, small quartzite flakes and turtle carapaces were collected from the surface, within the radius of 70 meters from the burial. Two decorated sherds and one nose-ring carved out of the *Strombus gigas* shell were also found at this site (Figure 87, A). One sherd shows an incised line that encircles in its centre a round-shaped pellet that is in turn punctated in its centre. A similar sherd was recovered in the El Cuartel site, in the Carúpano area, eastern

Venezuelan coast, dated to a.d. 290 (Vargas 1979: Fig. 67) and was considered a non-classified decorated sherd. I suggest that, given this stylistic parallel, this sherd can be considered as a part of a Saladoid assemblage excavated in the Los Cumaneces (TR/H) Saladoid site. I suppose that the open bowl, as well as the shell nose-ring found in TR/A site can also be considered as integral elements of the material baggage of the occupants of the Los Cumaneces site.

A modelled/incised rim lug adorno representing a zoo- or anthropomorphic face is probably a much later intrusion in the TR/A site. Similar adornos were found in three other insular sites: OR/F, BC/A and AG/A. All these sherds are similar to the decorated sherd recovered by Osgood and Howard (1943, Pl. 5, L) at Guaraguao in the Barcelona area, on the eastern Venezuelan coast (Anzoátegui State). Cruxent and Rouse (1958, vol.1: 199) classified Guaraguao as a Dabajuroid style site; however, they recovered there an admixture of Dabajuroid and Valencioid elements. Two painted sherds collected at the TR/E site seem to confirm the ephemeral presence of the bearers of the Dabajuroid pottery in La Tortuga Island.

No hearths were found in the Punta Delgada site; however, carbonised particles of wood scattered on the surface indicate that hearths must have existed and would have been damaged by the movements of the dunes.

Among the dunes at Punta Delgada there are few dry salt flats of several hundreds square meters that are covered by water during the annual rainfalls. In one of these flats, adjacent to the TR/A1 site, three big stones of quartzite, weighting between 10 and 20 kg each, and of a non-local provenance, were located. Hundreds of small flakes were scattered around these stones, suggesting that they were separated from them *in situ.* I presume that the firm and flat ground of this area was preferred by the Amerindians over the sandy dunes, to work the stones. A great deal of similar small quartzite fragments, together with two big quartzite stones (about 8 kg in weight each one), were also recovered during the excavations of the Los Cumaneces site, pointing out the similarity between the lithic inventory of these two sites.

It can be concluded that during the first centuries of the first millennium ad, the dunes of the Punta Delgada gave shelter, as well as an accidental ground for a burial, to the human groups that navigated from the central-eastern Venezuelan coast. These bearers of the Middle Orinoco Ronquinan Saladoid pottery had their main camp in the nearby Los Cumaneces site. About the beginnings of the second millennium a.d. the site was, probably, briefly visited by the bearers of Dabajuroid pottery.

Punta Salina (TR/B)

Punta Salina site is located in the north-eastern part of the La Tortuga Island, on the sandy bank situated only 17 meters from the seashore. The site lies on the sand bank, on the border of extensive plains that are partly flooded during the rainy and high sea level seasons (October-December). These flats extend toward the west from the site and are bordered by mangroves and a inner lagoon. In this floodplain the famous La Tortuga Island salt pans were exploited by the Dutch, English and Spaniards since the early colonial times (Humboldt 1941[1814-1825]). In proximity to these salt pans we expected to discover archaeological evidence that would demonstrate the proto- and possible prehistoric exploitation of the salt by Amerindian societies, but the quantity and diversity of Amerindian material was markedly poor in comparison to the mid 18th century English remains that were found in the same location.

The site is composed of four small cultural deposits dispersed along 100 meters of the sand bank. They are clearly visible on tops of the sand heaps because their grey colour contrasts with the yellowish sand which surrounds it. The artefacts began to appear just 5-10 cm beneath the surface and continued to a depth of 35-40 cm. However, in one pit situated on the eastern border of the bank, a few ceramic sherds and two hammerstones were recovered at a depth of 75 cm, within a stratum of yellow sand.

The artefacts in the TR/B site were scarce and concentrated neither vertically nor horizontally. Lithic artefacts are composed of quartzite flakes and hammerstones of allochthonous origin. The only animal remains were chiton plates, a few fragments of *Strombus gigas* shells, 15 *Cittarium pica* shells and scarce fragments of turtle carapaces, were recovered. A tiny hearth feature was located, but it did not contain enough material suitable for radiocarbon dating.

Pottery is represented by medium sized open unrestricted bowls and globular ollas. Decoration is scarce and simple: small pellets were applied to external walls of open bowls or disposed on tops of their rims. Five fragments of multiple-rod handles were recovered. Any comparative analysis of these scarce ceramic traits can have a very limited and speculative character, but certain suggestions can be made. Both the appliqué work and the rod handles might link the TR/B assemblage to that from the OR/F site, in La Orchila Island. In consequence, both assemblages would be related to the Valencioid series, especially to the Río Chico style, which is geographically very close to La Tortuga Island. However, given the scarcity of decorated sherds, as well as their low diagnostic value, the IT/B site cannot be definitively related to any particular ceramic series.

Apart from its location on the border of the salt pans, the structure and content of the IT/B site did not yield any data indicative of salt gathering or processing. These data do not imply that the occupants of this site or even other unknown human groups, would have not been engaged in salt exploitation. The salt, for instance, could have been gathered in the salt pans and loaded into canoes using simple utensils made out of perishable materials, such as wooden shovels, baskets, bottle gourd spoons and containers. However, the human component involved in such exploitation seems to have been low in number, and remained in the site for a short time.

La Orchila Islands

OR/H is an ephemeral site situated about 400 meters to the east from the OR/F site (Figure 16). It lies on the shore of a small, shallow lagoon between the seashore and a strip of mangroves. Small quartzite flakes and chiton plates were scattered on the surface of the site. Only 12 small plain sherds were recovered from the test pit excavated in this site, to a depth of 10-15 cm from the surface. Inferences about this site nature are speculative. It might have been a special purpose site of Ceramic Age people, destined, for example, for the processing/consumption of chitons, or, it could be even seen as an Archaic Age site.

The second undefined site, CED/A, is located on El Dorado key which extends to the north-east from La Orchila Island (Figure 16). The site is three meters from the small sandy beach, situated in the proximity to the only one inner lagoon and a chaparral of mangroves which are at all the north-western edge of this key. No artefacts were observed on the surface; however patches of dark soil with high content of organic matter are easily seen. The excavation revealed that the cultural deposit reaches only a depth of about 20 cm from the surface and the salt water level begins at a depth of 45-50 cm.

No hearth feature was recovered in the pit, but, abundant particles of burned organic matter dispersed thorough the deposit suggest that hearths originally existed. The recovery of four *Strombus gigas* and six *Cittarium pica* shells, as well as several fragments of marine turtle carapaces and chiton plates, would indicate the food processing activities proper to a small campsite. Only 16 plain fragments of globular cooking/storage ollas were found, and one of them shows traces of external red slip. These sherds may be related to the pottery of OR/F site and, in consequence, can be considered as a Valencioid-series-related assemblage. However, this affiliation can not be reliable until more material from this site is available for comparative analysis.

Los Roques Archipelago

A total of 21 sites from Los Roques Archipelago are stylistically undefined. I grouped these sites into three categories according to their structure, as well as quantity and diversity of recovered artefacts (Table 9). As ephemeral (category A) I consider those sites where potsherds appear on or below the surface but lack any contextual association. Sites CA/B and CA/C are good representatives of this category. In the CA/B site, several large sherds were recovered on the surface of a dune and no other artefacts or features could be found in the test pits excavated around them. The CA/C site yielded four fragments of poorly fired pottery of reddish colour, belonging to a globular micro-vessel. These sherds were recovered from a depth of 35 cm, in a test pit. Neither sherds nor other archaeological remains were recovered in the surroundings, for which reason this site is also regarded as 'ephemeral'.

Within the second category (B) I grouped heaps or middens of *Strombus gigas* shells which are the remains of *Strombus* processing/consumption activities. These middens vary in size, structure and content, reflecting considerable, although unknown, variability in their cultural origin, formation processes, occupational intensity and duration (Figures 70-72). The pottery recovered in these sites is scarce, eroded and undecorated. Hearths, as well faunal remains other than *Strombus gigas* shells, are also rare. The circular hole in the spires, shown by the great majority of the shells that make up these middens, has usually been associated with the aboriginal technique of meat extraction (see De Booy 1915; Keegan n.d., 1984; Antczak and Antczak 1986a; 1987b; Watters et. al 1992: 33). However, it should be emphasised that both the presence of perforated shells in the middens, and potsherds scattered superficially among the shells, do not necessarily prove the Amerindian origin of these middens; the shells could also have been discarded during historic times by non-Amerindian people. Caution is particularly needed when assessing the origin of middens in the IL/B, ESN/B and RA/B sites where remains other than the *Strombus gigas* shells were, thus far, not recovered. These poorly understood sites could also be interpreted as specialised activity areas of ceramic-bearing people (aceramic or nonceramic sites, see Lundberg 1985b) or could be candidates for pre-ceramic Archaic Age sites (see Watters et al. 1992: 25).

I distinguish two sub-categories within the category (B) of *Strombus* deposits. The first sub-category (B1) includes four sites (CS/E, RA/B, IL/B and ESN/B) that are shell middens *per se*. One of these middens (CS/E) is deposited in a line along the ancient shoreline; the remainder lie in heaps and shallow patches of irregular shapes. Except for the CS/E midden, which in some parts reaches the altitude of about 2 m, the others are barely elevated above the surrounding terrain. They are found close to the modern shoreline (ESN/B, IL/B), separated from it by dozens of meters (CS/A), or directly in the intertidal zone (RA/B). The CS/E midden is anomalous within this category in terms of its dimension and other physical attributes. It stretches in a discontinuous line over a few hundred meters toward the western extremity of Cayo Sal Island. This *Strombus* deposit is, by far, the largest feature of this type in all the Venezuelan islands, and one of the largest in the Caribbean. In fact, it is rather a series of interconnected heaps and surface scatters of shells, than one compact and spatially circumscribed mega-midden. The heaps which compose it can be up to about two meters high, in some sectors, and their width varies from two to five metres at their bases. These deposits are undoubtedly cultural formations since the great majority of shells that compose them show circular holes in their spires, a feature that is generally considered as indicative of the aboriginal technique (punched-hole technique) used for meat extraction. Only a few eroded, plain potsherds were collected among the shells, on the surface of the heaps. A few other sherds, as well as fish vertebrae, turtle bones and one hearth feature, were recovered from a depth of 30 cm below the surrounding terrain, at the base of the easternmost heap. The aerial photographs show that the *Strombus* line is located inland (x>50m) from any modern coastline, stretching parallel to the north-eastern coast. This configuration may suggest that the shells were originally discarded on the palaeoshore, or even directly in the shallow waters. Furthermore, it can be suggested that the deposition of the shells directly on the palaeoshore could increase the retention of sediments and interfere with the natural circulation of water, promoting the expansion of the island toward the north-east. It is noteworthy that extensive sea-grass beds, covered mainly by *Thalassia testudinum*, stretch to the north-east and east from the coast adjacent to the *Strombus* deposit. Until the present, these beds have been considered as the richest habitat for living *Strombus* populations, in all Los Roques Archipelago (Hauschild and Weil 1983; Felipe Salazar and Pablo Segundo Mata, personal communication 1983, 1988).

In the second sub-category (B2) I include three other *Strombus* deposits (PL/A, MO/A and IL/A), in which some archaeological remains were recovered from the surface of the middens and from their surroundings (Figure 25). These surroundings are usually shallow cultural deposits (x<15 cm below surface) distinguished by dark grey soil patches; they can contain some potsherds, quartz flakes and chiton plates. The PL/A site is exceptional within this category. During our first survey of La Pelona Island we got the impression that whole island might have grown up around huge amounts of *Strombus* shells discarded by Amerindians in the shallow waters. Several *Strombus* middens up to 2 m in height are concentrated in the south-eastern part of the islands. However, large quantities of perforated shells are visible in different parts of the southern and western shores, disappearing under water. In the test pits excavated in the centre of the island the perforated shells still continued below the water-table level. The excavations in test pits yielded one hearth feature at a depth of 45 cm associated with two *Strombus* lips, four *Cittarium pica* shells and a fragment of turtle carapace; no potsherds were recovered from La Pelona Island.

In conclusion, the archaeological evidence thus far obtained suggests that the *Strombus gigas* deposits, included within the B1 and B2 categories, can be considered as (1) special activity sites of Ceramic Age people, (2) preceramic sites or (3) non-Amerindian sites. My guess is that some of them may be of preceramic origin, but the majority are probably Ceramic Age deposits. Some of the Ceramic Age deposits may also overlie preceramic strata. If my reasoning is correct, then it seems evident that some Ceramic Age sites in Los Roques Archipelago were functionally related to these *Strombus* deposits, and these relationships are to be proved in future excavations.

The third category (C) of undefined sites in Los Roques Archipelago encompasses sites with a clearly defined cultural layer which stretches from the surface to a depth of 20 to 30 cm. These sites are also associated with discarded *Strombus gigas* shells, like almost all other insular sites, but here

TABLE 9. ***Classification of stylistically undefined sites in the Los Roques Archipelago (structure and content).***

Site code	Category	Description
CA/B	A	ephemeral site
CA/C	A	ephemeral site
CS/E	B1	shell midden
ESN/B	B1	shell midden
IL/B	B1	shell midden
RA/B	B1	shell midden
IL/A	B2	deposit dominated by shells
MO/A	B2	deposit dominated by shells
PL/A	B2	deposit dominated by shells
BC/A	C	stratified mixed deposit
ESN/A	C	stratified mixed deposit
FS/A	C	stratified mixed deposit
GR/A	C	stratified mixed deposit
ILR/A	C	stratified mixed deposit
ILR/B	C	stratified mixed deposit
ILR/C	C	stratified mixed deposit
MA/A	C	stratified mixed deposit
NO/A	C	stratified mixed deposit
NR/A	C	stratified mixed deposit
PC/A	C	stratified mixed deposit
RA/A	C	stratified mixed deposit

the shells and their fragments are not very abundant and do not take the form of heaps. Hearths, potsherds, stone artefacts and faunal remains were usually recovered during the surveys of these sites. Even though, thus far, diagnostic pottery has not been found in these sites, I consider that they have a potential to yield not only diagnostic material but also contextual information and datable samples.

Conclusions

Among 47 Amerindian sites located on 26 islands off the central Venezuelan coast 17 (36%) have been culturally affiliated to already known ceramic series from the adjacent mainland and islands: Saladoid (2 sites), Ocumaroid (1 site), Dabajuroid (8 sites) and Valencioid (6 sites). 30 sites (63%) from 14 islands remain, thus far, stylistically undefined.

The geographical distribution of archaeological cultures on the off-shore islands mirrors that from their cultural counterparts in continental Venezuela. Similarly, the cultural chronology of these islands is closely tied to the chronology of the mainland. Thus far, the oldest cultural remains recovered in these islands are those related to pottery-bearing societies; confirmed preceramic or Archaic sites have yet to be located. It is interesting to note that neither the bearers of Tocuyanoid nor Barrancoid potteries, the first agriculturists and pottery makers, who appeared in the scenario of north-central Venezuela at the beginnings of the Christian era, did not reach the off-shore islands. Likewise, the bearers of the Saladoid pottery, who did not establish any permanent settlements in the north-central Venezuela but who, presumably, visited its coasts from the east, did not arrive at these islands. Saladoid pottery, related to the Middle Orinoco ceramic tradition from Ronquín site, reached only La Tortuga Island which is the easternmost and closest to the mainland of all the islands discussed in this study. Saladoid people camped there, probably, at the beginning of the Christian era. It was not until a thousand years later, about the 11^{th} century, that the central insular groups (Los Roques, Las Aves, La Orchila) were settled by Amerindians. It was the Ocumaroid peoples, from the central-western Venezuelan coast, who established the first Amerindian campsite in the Los Roques Archipelago. About the same time, or slightly later, other human groups of unknown cultural affiliation, perhaps pre-Valencioid people as I suggested previously, also began to camp in the Los Roques islands. Soon afterwards, by the 12^{th} century, the Dabajuroid people from the north-western Venezuelan mainland and/or from Aruba, Curaçao and Bonaire islands, began to visit the Las Aves de Sotavento Archipelago, to the west from Los Roques islands. The presence of Valencioid people in the Los Roques Archipelago is firmly documented by the 15^{th} century (Dos Mosquises site). However, the Valencioid avant-garde, that bore the Cayo Sal style pottery, reached these islands about 200 hundreds years earlier. The pre-fifteenth century incursions of Valencioid people into the off-shore islands might also be suggested by the Valencioid-related pottery assemblage deposited in the La Orchila Island, in the 14^{th} century. The evidence indicates that only the Valencioid and Dabajuroid people frequented these islands until the time of Spanish Conquest. Some segments of Dabajuroid societies, with severely impoverished material baggage, were the last Amerindian navigators who visited these islands, probably, until the mid 16^{th} century.

Chapter Eight

The non-ceramic remains from the DM site

Site characteristics and excavation parameters

The Dos Mosquises or Domusky Sur Island is located on the western border of the Los Roques Archipelago, in a liminal spot between the shallow and naturally protected internal lagoon of the archipelago and the open sea. It is a low, flat and sandy key, covered predominantly by grasses, with a small arboreal community of mangroves to the south and patches of white mangrove (*Conocarpus erectus*) to the south-east. Its area is barely 15.5 ha (Buitrago 1982).

According to local oral tradition the fishermen avoided camping on the island between October and December due to the heavy mosquito plague (Felipe Salazar, Teobaldo Salazar 1983). However, temporary shelters were constructed and used on Dos Mosquises Island and on the western edge of Cayo Sal (*Uespen de la Salina*) for as far as they could remember. These sites were valued for their proximity to the best gill net fishing grounds, to extensive *botuto* populations, salt pans (Cayo Sal) and the natural reservoir of potable water (Cayo de Agua). The protected waters between Dos Mosquises and Domusky Norte Islands are considered as the best point to anchor or to moor during the navigation to and from the mainland. Some fragments of 19th century stoneware and food debris, probably related to a campsite of fishermen from Bonaire or Curaçao, were found on the south-eastern coast of Dos Mosquises. Since 1963, installations of the Marine Biology Station of Los Roques Scientific Foundation were successively constructed along the northern coast of the island, including houses, laboratories and an aeroplane landing strip.

The DM site occupies ca. 750 m² and stretches toward the south-east from the central part of a long sandy beach located on the north western shore of the island (Figures 27 and 28).

Despite the earthworks related to the construction of the facilities of the station, only a small part of the site was affected (Dix and Douglas Branch, personal communication 1983-84; Figure 29). However, it is probable that an undetermined extension of the site might have also been affected by the construction of the landing strip. According to the interview with the persons who observed these works in the early 1970s, apart from sparse potsherds no other archaeological material was found. Nevertheless, a find of possible human bones was mentioned (Enrique Lander, personal communication 1989).

Six trenches (A-F), accounting for 421 m², and 43 test pits with a total of 49 m² were excavated in DM (Figure 30). Additionally, systematic shovel testing (75 small probes) was carried out in order to determine the depth and outline of the site and artefactual distribution.

Sieves with one square millimetre mesh were used for screening of the major part of excavated soil, considered as the optimal devices for faunal recovery from shell-containing deposits (see Bowdler 1983; Wing and Quitmayer 1985). All cultural deposits from Trench B were screened through the fine mesh (1mm²). However, the same procedure could not be repeated in all excavation units. The modern-disturbed areas of Trench A were screened through eight millimetre mesh (Figure 33). The fine mesh screening in KR was abandoned after determining that there was severe anthropic alteration. In CS/D the units which were not screened were those inundated by the lagoon water or altered by the fishermen (Figure 68).

In all sites the excavation proceeded in arbitrary levels of 20 cm. No vertically separated cultural layers were distinguished in the site; however, lenses of dark grey soil containing archaeological remains, separated by tiny grey-yellowish sterile lenses, were observed, especially in Trench C, DM site.

No archaeological remains were found on the surface of the site, except for Trench A where a few Amerindian artefacts were found by amateurs, and where the soil was altered in several spots, in the late 1970s (Rölf Römer, Joaquín Buitrago, personal communication 1982-83). Small and low heaps of *botuto* shells are situated in the centre of the island, on the northern border of the site; some tiny and heavily eroded ceramic sherds were recovered among these shells.

Close to the beach (Trenches A and F) the cultural deposit begins almost from the surface and reaches the depth of about 25-30 cm. In the area of Trench C the deposit reaches a maximum depth of about 50-55 cm and begins 10-20 cm below the surface (Figure 57). The grey-coloured cultural deposit can be clearly distinguished in the soil matrix from the sterile pre-cultural yellowish substrate. In general, the colour of the cultural deposit becomes lighter while moving from Trench C to A.

TABLE 10. ***Parameters of in trench excavations in DM, CS/D, KR and OR/F Valencioid sites.***

Trench	Excavated area (m^2)	Total volume of excavated soil (m^3)	Maximum depth of cultural deposit (cm)	Average thickness of cultural deposit (cm)	Total volume of excavated cultural deposit (m^3)	Excavated area where 1 mm^2 mesh was used (m^2)	Volume of cultural deposit sieved with 1 mm^2 mesh (m^3)
				DM site			
A	187	93.5	30	20	37.4	86	17.2
B	65	29.5	40	20	13.0	65	13.0
C	150	120	55	25	37.5	79	19.7
D*	5	4.5	80**	80	4.0	3	2.4
E	8	4	40	20	1.6	8	1.6
F	6	3	25	20	1.2	2	0.4
Subtotal	421	254.5	Average:45	Average:31	94.7	243	54.3
				CS/D site			
A	37	37	70	30	11.1	12	3.6
				KR site			
A	44	44	45	?	?	10	?
				OR/F site			
A	15	15	70	45	6.75	15	6.75***
Total	517	341.5	Average: 50	Average: 32	112.55	265	57.9

* Area of pre-Valencioid cultural deposits. ** Additional 20 cm should be added which correspond to the part of heap which emerges above the surrounding surface level. *** The eight square millimetre mesh was used in sieving.

More hearths and organic materials were discarded and decomposed inland. In fact among 40 well defined hearth features 62.5% (N=25) were recovered in the area of Trench C, and 22.5% (N=9) in Trench A. Trench B yielded three hearths, Trench E two and Trench D one. All hearths were situated at depths between 25 and 50 cm. In Trench A, where the cultural deposit is shallower, the hearths were found at a depth between 25 and 30 cm; in the rest of the trenches no hearth was found above 35 cm. The vertical concentration vs. horizontal dispersion of hearths indicate that they were originally situated at a horizontal feature plane. This may indicate an overall time frame for the Valencioid cultural deposits at DM suggesting a type of relatively frequent intermittent occupations of the site.

Palaeoambiental and chronological considerations

Analyses of the relationship between the depth of the water table and the maximum depth of the cultural strata in and off the DM site indicate, that the Valencioids selected the most elevated areas of the north-eastern part of the island for their camps (Table 11). The question arises: Are the modern shape, extension and vegetation of the island similar to these which existed at the time of the arrival of the first Amerindians?

TABLE 11. ***The water table depths in and off the DM site and the depth of associated cultural strata. Measurement taken between 3 and 5 August, 1987 (see Figure 30).***

Spot	Water level depth (cm)	Depth of cultural strata (cm)
Trench A (average)	135	20-25
Trench B (average)	121	45
Trench C (average)	95	55
DM/A/F/1	85	74
M	70	-
DM/D	64	70
1TP	63	48
2TP	54	-
3TP	49	-

The concentric traces of palaeoshorelines are clearly visible on DM aerial photographs. These features begin on the north-eastern shore and continue west, toward the line of prehistoric shell heaps (area of Trench D). These patterns suggests that *Strombus gigas* shells may have been originally deposited directly on an active seashore (Figures 30-32). This hypothesis was partly confirmed during the excavation of Trench D that cross-cuts the shell formations. The crust of an ancient sandy beach was clearly identified at a depth of 75 cm, and a few artificially perforated shells were encrusted in it. The discard of large *Strombus gigas* shells directly on the beach could obstruct natural water circulation and accelerate sediment capture. In consequence, the shore could grow eastward. According to the radiocarbon date obtained in Pit 1K, the shells from the bases of the heap must have been deposited on the beach before a.d. 1200. How long before this date cannot be determined. The off-site sampling carried out to the east from the shell heaps showed a wide gap of sterile soil stretching between the heaps and the area of Pit 1K. This may indicate that the first visitors to the island camped directly on the beach, in the area where the shell heaps are situated today. The molluscs were collected in adjacent shallow waters and discarded just beside the campsite.

The sherds recovered from Trench D were scarce, plain and stylistically undiagnostic. The same stylistic uncertainty applies to the sample from Pit 1K. In consequence, I suggest that by a.d. 1200, (1) the eastern shoreline of the island was further to the west, about 200 m in relation to its present position, and that (2) the 'pre-Valencioid' camp processed and discarded *Strombus gigas* shells directly on the shore.

It seems probable that the low area of dense grasses situated east of the site may be a relic of an ancient small lagoon once bordered by mangroves. Expecting that the vegetation history of this island and its correlation with the soil profiles and cultural remains might shed light on the palaeoenvironment and aspects of the purported growth of the island toward the east, 11 samples for soil pollen analysis were taken from and off the DM site. *Avicennia germinans* pollen was the only species found, and only in one sample (Valenti Rull, personal communication 1991). The difficulty of recovering pollen from these aeolian sediments was expected, given that the sites were covered by wind-blown calcareous sand (see Dimbleby 1985). However, we still know very little about the soil chemistry and the microbiological action that can influence the preservation of pollen grains in these islands.

The present distribution of mangrove communities in the island is highly uneven. Small patches of black (*Avicennia germinans*) and red (*Rhizophora mangle*) mangroves on the south-eastern coast are in the initial period of growth and expansion. Instead, the mangle *botón* (*Conocarpus erectus*) successfully colonised flat areas north-west from this coast, stretching as far as the southern corner of DM site.

The southern coast shows evidence of an ancient system of interconnected lagoons and marshes. Except for one small active lagoon, the rest are today dried and filled up with sediments. All these formations are bordered by groups of red and black mangroves, some of them being tall, old specimens. The remains of the mangrove-lagoon system are separated from the present shore, and a coral stone storm terrace is situated between them. While the developmental history of the southern coast is unknown, it seems probable that the remains of the lagoon-mangrove system on the southern coast and the beach-rock formations on the north-western edge are the oldest formations in DM. It is interesting to observe that only one specimen of white mangrove (*Laguncularia racemosa*) was located on DM Island (Jorge Gutic, personal communication 1990). It may be hypothesised that the exploitation of mangroves for firewood and traps and shelter constructions by Amerindian and historic inhabitants was so selective that the more valuable wood species such as white, black and red mangroves were overexploited. Whether the long-lasting effects of such ancient anthropic alterations may be observed on today's vegetation structure on DM Island can only be addressed with further systematic geomorphologic and paleoecologic research.

Molluscan remains

In Chapter 7, I discussed the role of human agency in the origin and formation of prehistoric shell-contained deposits in the Los Roques Archipelago. Once their artificial origin has been determined, the next question focuses on the reasons for the molluscs' introduction into these deposits. At this juncture proper distinction between molluscs collected for food, raw material and/or for other purposes (i.e. containers, hearth bases, net sinkers, ritual paraphernalia, curiosities), and those that pertained to the natural sedimentary matrix, or were introduced by natural agents to the site, are of crucial importance. It should be born in mind that, for example, calculating shells that are not food debris, but would have been erroneously considered as such, undermines not only the reliability of any dietary statistics but may also distort any chain of non-dietary inferences (see Ceci 1984: 64; Waselkov 1987).

To diminish such interpretative errors the ecological and taphonomical analyses should be an integral part of the process of investigation of archaeological molluscan assemblages; otherwise, the taxonomic lists only give 'a report, a facade of scientific accuracy and thoroughness, though in fact their value is quite limited' (Baerreis 1973: 43). The contextual analyses of the marine molluscs incorporate, generally, only shell artefacts, while the origin as well as possible functional and symbolic meanings of unmodified molluscs are often implicitly assumed or ignored.

It is well recognised that discrimination between shell artefact and natural shell is a difficult scientific exercise, especially, when the analyses take into account the general appearance and macroscopic morphology of the shell alone (Spennemann 1993: 47). However, several contributions provide methodological devices that aid the distinction between natural and cultural shell deposits (Sullivan and O'Connor 1993; Ceci 1994) and between modification of shells by anthropogenic and by natural agents (i.e. Francis 1982; D'Errico et. al 1993; Taborin 1993). Use-wear analyses have to be done, as well as taphonomy, ecology, and contextual associations of archaeological molluscs have to be exhaustively analysed and discussed to assure the success of these discriminatory processes.

In this chapter, I discuss a total of 12,672 marine shell specimens recovered from the Dos Mosquises Island (DM) archaeological site. This number includes: 8549 *Strombus gigas* shells, their fragments and artefacts, that account for 6696 individuals (MNI); 3962 non-*Strombus gigas* shells (MNS) and 161 fragments that represent 1982 individuals (MNI); additionally shells recovered in the off-site samplings have also been analysed.

This chapter is divided in two parts. It begins with the analyses of the *Strombus gigas* shells which, by far, dominate quantitatively the sample. The second part discusses the non-*Strombus gigas* marine molluscan remains. Both discussions are relatively autonomous exercises in terms of methods and goals, until they flow into the comparative analyses between insular and mainland shell assemblages. Finally, hypotheses about marine mollusc flow between islands, coast and inland, within and beyond the Valencioid Sphere of Interaction, as well as about social use of the molluscs and certain ideological aspects of the Valencioid people's attitudes toward them, are discussed.

Strombus gigas: the fruit of paradise?

The large protein yields, high spatial concentration and reproductive rates, as well as easy access and low risk involved in the exploitation, makes the *Strombus gigas* molluscs one of the most attractive food resources for Caribbean societies. The flesh of *Strombus gigas* may be consumed raw, or cooked or roasted; if salted and sundried it may last for 5-6 weeks (Teobaldo Salazar, Felipe Salazar, José Ana Marval, personal communications 1982-85). Apart from its dietary value, the large dimension of the shell, its original external sculpture and physical-chemical properties, are so outstanding in comparison to other locally available shells that the native inhabitants of this region selected it as a 'container' for ideological loads. Large quantities of whole and modified *Strombus gigas* shells, as well as artefacts made out of them, have regularly been recovered from Archaic or preceramic sites of the Caribbean, dating from at least 5000 years b.p. (e.g. Armstrong 1979; Reiger 1979; Lundberg 1985b). In several regions this exploitation continued thorough Ceramic Period and proto- and historic times (e.g. Keegan 1981; 1982; 1984; Antczak and Antczak 1986a; 1987b). Today *Strombus gigas* is still a source of food and craft work for almost 20 Caribbean countries (Aranda and Desmarais 1994: 97). However, fishing for it has been prohibited or reduced in many islands of the Caribbean due to its overexploitation (see Appeldoorn and Rodríguez 1994).

The *Strombus gigas* fisheries in Los Roques Archipelago stand out in the Caribbean scenario by their large dimension. Large mega-middens composed of thousands of thousands of shells, scattered on several cays of the archipelago, are direct testimonies of the large scale of exploitation of this resource in the past. These mega-middens, represent, at a first sight, thousands of kilograms of meat that had been used for food. The modern middens are no less impressive in volume than their prehistoric counterparts. An annual average production of over 200,000 kg of *Strombus gigas* flesh was reported in early 1980s in Los Roques Archipelago (Laughlin et al. 1985). The *Strombus gigas* mollusc is presently known on Los Roques Archipelago as *botuto* and this vernacular word will be used here alternatively with the scientific name.

It is known, from the archaeological record, that *botuto* shells had been used as a raw material by the prehistoric inhabitants of north-central Venezuela since the Archaic or preceramic period (3500 b.c. [Cruxent and Rouse 1958]). Large quantities of whole shells and shell adornos were reported from the late prehistoric sites in the Valencia Basin (Marcano 1971[1889-1891]; Bennett 1937; Osgood 1943; Kidder 1944), as well as from the Venezuelan Andes (Vellard 1938; Briceño-Iragorry 1928), especially from the piedmont area of Quibor (Vargas et al. 1984; Arvelo 1995).

Might the exploitation of the *botuto* in the Los Roques Archipelago have been related (and how) to the web of economic, socio-political and ideological attitudes adopted toward this mollusc by the coastal and inland located Amerindian societies? Were the Amerindian visitors to these islands exploiting *botuto* for food, as a raw material, or for other, as yet unknown, non functional reasons?

Goals, concepts, methods

In order to address the above questions some assumptions about the interpretative values of the Dos Mosquises Island *botuto* shell assemblages should first be discussed. The large and solid shell of this gastropod is particularly well suited to resist the adverse action of the majority of natural taphonomic agents operating in the insular environments, especially in comparison to smaller and more fragile shells, not to mention the bone remains. The probability of archaeological recovery of almost all *botuto* shells that were brought to and discarded in the site during past activities, is relatively high. Because *botuto* shells are large and relatively heavy, they are more likely to be found just where they had been discarded. When trampled, they do not change their spatial location like smaller artefacts may do, especially in fine insular sand (see Ebert 1992: 168). Scatters and heaps of these shells are the most visible elements of the structure of Amerindian use and re-use of insular space. The mega-middens are a particularly monumental heritage of the prehistoric insular landscape.

Even if the deposited *botuto* shell assemblages were mildly affected by diagenetic processes, the material results of brief single historic events cannot be distinguished in their present spatial configurations. The archaeological deposits are, with few exceptions, not 'photographs' of past moments; therefore, the composition and spatial configurations of the *botuto* assemblages in the DM site cannot match precisely any concrete prehistoric socio-cultural system or economic formation (Clarke 1968: 287; Bailey 1981: 109; Hodder 1991; Ebert 1992; Marciniak 1996: 95). These assemblages are a result of sets of different individual and group activities that could rather tend to overlap from one to another episode of occupation and reoccupation of the site. It should also be remembered that the sites might have been occupied by socio-culturally diverse human groups, that might have arrived at the islands with functionally and ideologically similar or different purposes, for shorter or longer time spans. In sum, there are many reasons to believe that the majority of depositional sets of *botuto* shells in DM site are overlapping and polythetic (see Carr 1984: 120).

Before any interpretation of the distributional patterning can be attempted, the spatial/temporal unity/diversity of compared units of excavation and archaeological deposits should be elucidated. The cultural deposits crosscut by the Trenches A-C, F and E in the DM site are characterised by the relatively narrow temporal range (ca. 210 radiocarbon uncalibrated years) and cultural homogeneity (Valencioid culture). The deposit crosscut by the Trench D, which gave the earliest date within the DM site, is culturally (stylistically) unaffiliated. These two groups of deposits are, probably, not the result of activities carried out during two <u>single</u> historical events of site occupation. The results of activities related to each single event of activity/deposition cannot be stratigraphically distinguished in DM. It also cannot be claimed that the Valencioid deposits crosscut by each particular trench are contemporaneous and are the result of the activities carried out by the same social segments of the Valencioid societies (in terms of their social composition and overall number of individuals). What then is open for interpretation and how may it be accomplished?

I assume that the *botuto* remains in the DM site may mainly be the result of shell discard during or after (1) the flesh extraction, (2) shellworking activities and/or (3) any other unknown activities (see also Keegan n.d: 2). Once the flesh is extracted and the shell discarded, no direct archaeological remains of *botuto* consumption practices are left, unlike in the cases of the consumption of mammals, birds or fish. It is my assumption that the loci for the first and second of the above mentioned activities might have been spatially separated during the same occupational episode. Certainly, the shells used in more than one activity might have ended up in the same depositional context (Schiffer 1976). However, using the comparative analyses of statistical figures of spatial distribution of morphologically different/similar shells within and between excavation units and cultural deposits within the DM site, I attempt to determine whether any particular areas of the settlements were used or not for specific tasks during the successive reoccupation of the site. These morphological and distributional data are also used for temporo-spatial comparative intra-site analyses and to infer the functional and symbolic meanings of the shells and their deposits. There are several difficulties in interpreting multivariate spatial patterning. To provide means of objectification to these interpretations I carried out several experiments and used biological as well as ecological data concerned with modern mollusc populations in the Los Roques Archipelago.

Biological and ecological background

This brief discussion of *Strombus* biogeography, biology, ecology, population dynamics, development and anatomy is indispensable for the understanding of the subsequent discussion. Readers interested in more details are referred to the specialised bibliography (Acosta 1994).

Five species of Strombidae are known in the Caribbean: *Strombus gigas*, *Strombus raninus*, *Strombus pugilis*, *Strombus gallus* and *Strombus costatus*. The area of distribution of *Strombus* spp. comprises Bermuda, Bahamas, south Florida and Gulf of Mexico and the West Indies to Brazil (Warmke and Abott 1969; Abott 1974). All these species have been reported from Venezuela where *Strombus gigas* is known as *botuto*, *vaca* or *guarura* (Cervigón and Velázquez 1981). In coastal Venezuela *botutos* may be found from the Peninsula of Paraguaná to the Peninsula of Paria; however, always in low densities. In the areas of Morrocoy, Gulf of Cariaco and along the eastern coast this species is practically extinguished (Flores 1964; Almeida 1973; Cervigón et al. 1992). The largest populations of Strombidae in Venezuela still remain in Las Aves de Sotavento and Los Roques Archipelagos, while considerably smaller ones are found in La Orchila, La Tortuga, La Blanquilla and Margarita Islands (Rodríguez and Posada 1994; Sociedad 1956).

All five species of Strombidae are present in Los Roques Archipelago (Rehder 1962; Work 1969). *Strombus gigas* is, by far, the most abundant species (Brownell 1977; Rehder 1962; Work 1969). The large extensions of seagrass beds, mainly *Thalassia testudinum* and *Syringodium filiforme*, at a depths between 0.5 and one meter, cover an area of about 5400 km^2 (Laughlin and Weil 1983). These beds are the ideal habitats of Strombidae. The area on which the collection of *botuto* has traditionally been concentrated is situated along the large interior lagoon of the archipelago, between Isla Larga to the north and Cayo Sal to the south, stretching to the west to Dos Mosquises Island and to the east to the Boca de Sebastopol (Laughlin and Weil 1985 [Figure 24]).

The area that surrounds Dos Mosquises Island is one of the best studied *Strombus gigas* habitats in all the Caribbean (Brownell 1977; Santis 1982; Laughlin et al. 1985; Weil and Laughlin 1984; Rodríguez and Posada 1994). To the east from the island, and immediately from the shore, extends a 50 m wide strip of *Thallasia testudinum* beds, covering an area of ca. 3400 m^2, with waters of between 0.1 to one meter in depth (Laughlin and Weil 1985). The average *botuto* densities in this area are between 0.48 to 0.53 individuals per square meter (Laughlin and Weil 1985). Due to the total protection by the Los Roques Scientific Foundation of this zone from fishing activities since at least 1963, these densities are considered as natural. Moreover, toward the north-east of this area, extreme densities of 2.1 individuals per square meter were found, which are the highest all the Caribbean (Laughlin and Weil 1985; see Ruíz 1983). As a comparison it may be noted that Alcolado (1976) reported 0.97 individuals per square meter in his research area in Cayo Matías, Cuba.

Laughlin and Weil (1985) also found that the reproductive potential of Dos Mosquises' *botutos* is extremely high in comparison to other areas of the Caribbean. Dos Mosquises' *botutos* tend to repopulate in relatively short time in overexploited areas. These data clearly indicate that Los Roques Archipelago is an ideal environment for *botuto* development, as may be judged by several remarkable ecological features of their populations that are not repeated anywhere in the Caribbean.

Mollusc growth and shell morphologies

Strombus gigas is a herbivorous mollusc that mainly ingests algae, turtle grass (*Thalassia testudinum*) and sand (Alcolado 1976). Its post-metamorphosis development comprises four stages: juvenile, sub-adult, adult and old (Alcolado 1976; Rathier and Battaglya 1994; Appeldoorn 1988; 1994). After a year of life the animal reaches a length of between 7.7 and 11.4 cm and during the next two years between 12.7 and 17.8 cm (Hesse 1979; Brownell and Berg 1978). The shell of the juvenile mollusc is thin, fragile and smooth and it is rarely affected by marine animals and non-biotic agents.

Toward the third year of life the mollusc is ready to develop the flared-lip. Its average length may attain 20.3 cm and it may weigh 2.09 kg, of which as much as 0.9 kg may correspond to the flesh (Brownell and Berg 1978). The shells of this subadult individual have well accentuated, sharp-tipped nodules (Alcolado 1976).

In the final stage of the subadult phase the mollusc reaches the maximum of siphonal length of up to 30 cm, ceases to grow and begins to produce the flared-lip. This last process may take from three to seven months (Appeldoorn 1988; Rathier and Battaglya 1994). The fully developed flared-lip is a characteristic of a sexually mature adult mollusc (Hesse and Hesse 1977; Appeldoorn 1988; 1994). The shell of an adult individual is more solid and heavier than that of the juvenile. All nodules are completely developed as well as all other elements of the external sculpture of the shell (Alcolado 1976). In Los Roques Archipelago the adult specimen may attain a length of between 14.5 and 30 cm (Laughlin and Weil 1985); shells longer than 30 cm were not reported from the Caribbean (Randall 1964). Size dimorphism has been reported in several Strombid species and it has been suggested that the females grow faster; their shells are broader, longer, spires are higher, the tissue weight is heavier (Randall 1964; Alcolado 1976; Appeldoorn 1988; Reed 1994). Given these dimorphic characteristics it may be expected that larger females might have been preferentially harvested (Davis 1994: 234). However, these differences are so subtle that it is quite difficult to differentiate males from females without examining their sexual organs or their mating position (Appeldoorn 1988; Davis 1994).

The mollusc can live upwards of 20 years (Appeldoorn 1994: 146). During this time the shell grows in thickness, but due to the natural processes of erosion and abrasion the shell's overall length decreases; the average length of old shells is smaller than that of younger specimens (Rathier and Battaglya 1994; Appeldoorn 1994). The outer lip of some of these old shells can be over five cm thick but the whole shell is deteriorated by animals and environment; the nodules are only slightly accentuated and worn (Alcolado 1976).

Mollusc processing; experimental essays

The most evident indication of the human use of *botuto* for food and, to less extent, for some other unknown purposes, is the circular perforation left in the spire of the shell (Figure 80). This hole permits the introduction of a sharpened artefact so as to cut the muscle that attaches the animal to its shell. By grasping the animal by its operculum and pulling it out it may be removed from the shell. This circular hole has been associated generally, though not exclusively, with the aboriginal technique of meat extraction (de Booy 1915; Brownell and Berg 1978; Keegan 1982; Antczak and Antczak 1986a; 1987b). During the first decades of this century this technique was widely used by the fishermen of Los Roques Archipelago while preparing food during the solitary fishing campaigns, or when a metallic instrument was not at hand (information obtained from old fishermen: Felipe Narváez, Felipe Salazar, Teobaldo Salazar, 1981-1984). The elongated, narrow hole, made by a metallic tool (i.e. machete), has been regarded as a non-aboriginal technique, introduced to the Caribbean by the Conquerors (Antczak and Antczak 1987b [Figure 80]); however, systematic studies of this phenomenon may determine whether all non-circular perforations may or not be considered as non-aboriginal. Brownell and Berg (1978) and Keegan (1982) suggested that the circular hole was made by striking the spire of the shell with the apex of another shell. It may reasonably be assumed that identifiable traces of such an operation should be left on the shell used as a 'perforator'.

In order to understand the material and spatial correlates of the 'aboriginal manner' of *botuto* processing for food, I opened experimentally circular holes in shells of 50 living molluscs (see also Keegan 1984: 15). The experiment was carried out on the beach of the Dos Mosquises Island. Among the perforated shells were 10 each of juvenile, sub-adult and old as well as 20 adult specimens. The *perforators* were selected from both living molluscs and shells found ashore; they represented all natural morphological types. During the experiment I held the *perforator* by its anterior part and struck the perforated shell with its apex (Figure 78). I observed that it was much easier to perforate shells that were lying on a large coral stone anvil, or directly on the wet sand. The process was more effective when carried out on the wet sand in the intertidal zone, than on the dry, loose sand of the beach or dune. The old specimens were definitely the worst *perforators* since the tips of their apexes were thick and rounded. Juvenile shells were too light to be effective 'against' adult and old shells; their apexes were too fragile to endure repeated blows. The adult shells, between 18 and 21 cm in length, were the most effective and durable *perforators*. In one instance an adult specimen of 25 cm in length, was able to efficiently perforate 23 shells until its apex became round and ineffective. However, the use of an adult shell *perforator* is neither entirely safe nor comfortable. The sharp edges of the flared lip may potentially hurt the hand that holds the perforated shell and, at times, may also partly cover the spot of operation. I realised that perforators were safer and easier to handle when their labial part was removed. However, at the same time, I noted that heavier perforators (with lips) were much more effective for perforating adult and old shells.

The location of the opening hole in the spire of the perforated shell must be very precise, otherwise additional holes are necessary to reach and successfully cut-off the attaching muscle (Figures 78-80). During the experiment, I twice had to open a second hole since I could not reach the muscle through the first opening. My errors occurred mainly because both adult and old specimens that were being perforated had thick bunches of algae adhered around their spires, which impeded the recognition of the correct spot.

I also observed that it was almost impossible to extract the animal from certain sub-adult specimens. After the muscle is cut off the animal retracts so deeply into its shell that it is impossible to grasp its operculum and pull it out. The only way to extract such a 'troublesome' mollusc was by breaking the labial part, using other shell or coral stone as a hammer, and pulling the exposed parts of the animal. Occasionally, some adult and old animals may be extracted from their shells simply by pulling the operculum, without the necessity of perforation (information confirmed by local fishermen Felipe Salazar and Pablo Mata, 1984).

To perforate 40 shells (5 juvenile, 25 adult and 10 old), remove the animal, separate the visceral parts and wash the meat required about 30 minutes. The attaching muscles of 37 specimens were cut off using a standard kitchen knife. However, in three cases I successfully used a long, narrow splinter of *botuto* shell as a chisel, hammering with a medium-sized round coral stone. The mollusc was placed on the beach sand, which in the intertidal zone is wet and hard, providing a firm 'anvil 'which facilitates processing. Once the meat is removed from the shell it should be washed in the sea to remove visceral parts and adhered sand. In consequence, it may be suggested that the Amerindian processing areas might have been preferentially located very close the seashore, especially when large quantities of mollusc were processed.

After the meat removal I discarded the empty shells on the beach, beyond the reach of the waves. For many weeks after the experiment, the discarded shells emitted a strong odour and attracted flies while the visceral parts that remained inside the shells were slowly decomposing. This evidence may suggest that certain heaps of prehistoric shells that are located very close to or within the habitation site were, probably, not discarded at the time of the site occupation.

The ethnographic data from the Caribbean provide descriptions of other techniques of meat extraction that do not leave a hole in the spire. One of them consists in putting entire shells, upside down, in the fireplace or very close to it for approximately an hour (information obtained from fisherman Luis Marcano who observed this practice in Margarita Island, in early 1980s). Reiger (1979) argued for major effectiveness of this technique in comparison to the perforation in processing univalves. I consider that this technique is inefficient for processing large quantities of *botutos* but expedient for 'dinner camps' (see Meehan 1977: 507).

Some techniques are employed by contemporary fishermen to obtain an intact shell, but they are ineffective to process larger quantities of molluscs for food. The animals may be hung for few days in sun until they die and the tissue decomposes. The living animal may also be put into a hypersaline lagoon for a few days to die; afterwards it is put upside down in the intertidal zone so as to permit the small animals and sand and water to wash its insides. Yet another technique consists in burying the living animal for several weeks in the sand. Some of these techniques may account for the presence of entire shells in the archaeological sites. They might have also been used when a whole shell was required; for example to produce a shell trumpet. It also is noteworthy that the contemporary fishermen from Los Roques Archipelago used to beat the *botuto* flesh using wooden rods, stones or hammers, to tenderise it before stewing for immediate consumption. They do the same, or make deep cuts in the flesh, while preparing it for salting and sun drying.

I also perforated several living *botuto* shells using the shell tip, opposite to the apex, as the working surface (so called hand-picks; see Lundberg 1985a; Dacal Moure 1997). I found that these tips were more durable than the tips of the shell apexes. However, to produce such a *perforator* the lip has to be detached; this results in a loss of weight, and in an increased ineffectiveness in the perforation of the thick-walled adults and old shells. I also performed several experiments attempting to break the *botuto* shell using other *botuto* shells, coral stones or lithic pebbles as hammers; I will refer to some of these results in the following discussions.

Whole shells

Almost all analysed excavation units yielded significantly more perforated than unperforated whole shells (Table 12). This indicates that the majority of *botutos* discarded in the DM site were originally processed for culinary purposes. However, certain figures in Table 12 call for special attention. How may the highest ratio of perforated shells in the Trench D be interpreted?

Given this ratio, as well as the overall structure (low shell heap) and location (on the palaeoshoreline) of the Trench D deposit, this may be considered as an area where Amerindian activities were oriented almost exclusively to the extraction of flesh with subsequent shell discard (Figures 64 and 65). This interpretation may also be reinforced by other characteristics of the deposit such as the highest density of *botuto* shells per cubic meter of the cultural deposit (Table 20), extremely low non-*botuto* taxonomic diversity (see Appendix 2), scarcity of potsherds (all are small, and only four of them, pertaining to the same vessel, are decorated), and the virtual absence of shell, stone and bone artefacts. However, it should be mentioned that two small hearths, as well as a few plain potsherds, fragments of turtle carapace and fish vertebrae, were found at a depth between 30 and 45 cm, toward the base of the midden (Figure 65). Were the lower and upper layers of the midden accumulated by culturally differentiated people and during temporally separated events? Unfortunately, the pottery cannot give as insight into the homogeneity/diversity and chronology of this deposit. Decorated pottery was not found in the deepest layers, and potsherds were not found anywhere in the mid-section of the heap until its top. At the top, four fragments of one pedestal base bowl with incised/punctated decoration were scattered among the shells. The superficial and solitary presence of this vessel, that may stylistically be either Valencioid or Dabajuroid, invokes too many possible explanations to be of any value for the cultural/temporal determination of heap's formation processes.

However, further analysis of the geomorphology of DM Island and of the structure and composition of the Trench D deposit can shed light on its cultural/natural formation processes and chronology. The evidence indicates that during the early stages of the formation of the Trench D deposit (its deeper layers) the Amerindians carried out there activities not dedicated exclusively to *botuto* processing (i.e. food preparation and consumption). If so, then the upper layer(s) composed exclusively of *botuto* shells might have been accumulated later, during one or more episodes of very intense mollusc processing and shell discard. How much later is difficult to determine. In fact, the conspicuous homogeneity of shell morphology thorough whole the deposit may suggest that it is, as a whole (upper and lower layers), a result of the discard activities of culturally homogeneous people within a relatively short time.

Even if I cannot determine whether the lower and upper deposits in the Trench D were or were not contemporary, I can reach some conclusions about the temporal relation between them and the inland Valencioid deposits. We know that the first shells processed in the area of Trench D, and probably the whole line of the adjacent heaps, were discarded directly on an active palaeoshoreline. Afterwards the coastline protruded eastward from this area (see Figures 31 and 32). We also know that the deposits situated 25 m to the north-east of Trench D gave a radiocarbon date of a.d. 1270±80 (pit DM/A/1K; Table 4; Figure 30). This indicates that the deposits associated with Trench D must have been created earlier than those of Pit DM/A/1K; sufficiently so to permit the formation of ca. 25 m of land that separates them. If my geomorphological reconstruction is correct, then at least the lower layers of Trench D were created before approximately a.d. 1200. Whether all these deposits were a result of activities carried out by the people culturally related to those who left the clearly Valencioid remains in the inland areas of Trenches A-C and E-F, cannot be determined.

I have already mentioned that the upper layers of Trench D cannot be conclusively considered as temporally and functionally separated from the inland Valencioid deposits. However, the homogeneity of the shell assemblage thorough whole Trench D deposit, the spatial separation between this Trench and Pit K, and the relation of both areas to the protruding palaeoshoreline incline me to consider that the whole line of heaps to the north and south from Trench D (Figures 30-32) may be a pre- a.d. 1200 deposition. Furthermore, they may be separated in time from the inland Valencioid deposits, even though all radiocarbon dates in DM site overlap at 2 sigma. For now, the deposits of, and adjacent to, Trench D are referred here as 'pre-Valencioid'.

Table 12 shows that *botutos* were processed for food all over the DM site, although with different intensities. If, however, the shell heaps located in the area of the Trench D and its surroundings are considered as the results of specialised *botuto* processing for food carried out on the palaeoshore, how then may other, inland deposits containing shells be interpreted? In particular, I refer to those deposits that contain high proportions of horizontally scattered unperforated shells, characterised by a low density and associated with hearth features, ceramic, shell, stone and bone artefacts. Among them the Trench B *botuto* shells assemblage show particularly anomalous figures such as (1) the highest ratio of unperforated old shells and in relation to other trenches, (2) the inverted proportion between perforated and unperforated shells. To address the possible significance of these anomalies we need to discuss additional distributional and contextual data.

TABLE 12. ***Whole, perforated and unperforated Strombus gigas shells from Trenches A-F, DM site.***

Shells	Trench A						Total	Trench B						Total	Trench C						Total
	0-20 cm			20-40 cm				0-20			20-40				0-20			20-40			
	J	A	O	J	A	O		J	A	O	J	A	O		J	A	O	J	A	O	
Perf.	7	2	2	233	31	1	276	1	-	-	42	50	1	94	29	17	-	577	697	227	1547
Unperf	3	2	-	79	3	2	89	1	-	-	24	95	24	144	49	22	2	448	217	250	988
Tot.	10	4	2	312	34	3	365	2	-	-	66	145	25	238	78	39	2	1025	914	477	2535

Shells	Trench D						Total	Trench E						Total	Trench F						Total
	0-20			20-40				0-20			20-40				0-20			20-40			
	J	A	O	J	A	O		J	A	O	J	A	O		J	A	O	J	A	O	
Perf.	420	112	-	558	111	-	1201	2	-	-	59	19	6	84	5	-	-	19	6	-	25
Unperf	23	2	2	16	-	1	44	-	-	-	12	2	2	16	2	2	-	9	1	-	10
Total	443	114	2	574	111	1	1245	2	-	-	71	21	8	100	7	2	-	28	7	-	35

J - juvenile, A - adult, O - old.

Modified shells and fragments

To begin with I should mention a small assemblage of 12 fragments of *botuto* shell that have no evidence of anthropic alteration. These are: eight gouge-like and four scoop-like specimens, found in Trenches A and E (similar to the Figure 77, type 37 and Figure 76, type 35 respectively). They are heavily water-worn on all their edges and surfaces. These specimens are either a part of a natural soil matrix or were brought to the site from the beach by the Amerindians. Identical specimens may be found washed ashore on all the beaches of the Dos Mosquises Island. However, it is noteworthy that not only water-worn fragments but also fresh-fractured specimens may be found on the insular beaches. The entire shell may be damaged when trapped within the coral rubble, which moves vigorously during the heavy seas. Some shells may also be crushed, occasionally in large quantities, and discarded in patterned sequence by natural predators (see Table 13).

The majority of *botuto* predators are able to crush juvenile shells (between 60 and 150 mm in length); however, some of them, like marine turtles and rays, may crush even adult and old individuals, leaving fragmented shells in shallow waters in regularly structured heaps (Table 13). The great majority of modified shells deposits in Dos Mosquises Island are located well inland from the seashore. Their modifications are, almost certainly, of anthropic origin. However, the shells altered by abiotic processes as well as by the predators may easily be confounded with those altered by humans, especially in situations where the modified shells and/or shell fragments are deposited in the modern intertidal zones or paleoshorelines (i.e. as many in Caribbean Archaic sites).

TABLE 13. ***The natural predators and patterns of their damage to Strombus gigas shell.***

Predator Phylum/Class	Predator Species	Morphologic type	Shell alteration	Discard pattern	Reference
Gastropoda	*Murex pomum*	All	Drilled	Unknown	Laughlin and Weil 1985
	Fasciolaria tulipa	All	None	Unknown	Robertson 1961; Jory 1982
Cephalopoda	*Octopus vulgaris*	All	None	Unknown	MacGinitie and MacGinitie 1949
		Juvenile	Drilled	Unknown	Brownell 1977
Crustacea	*Paguristes grayi*	Juvenile	Broken around aperture	Transported	Brownell 1977
	Petrochirus diogenes	Juvenile Adult?	Small shells crushed	Unknown	Randall 1964; Iversen et al. 1986
	Carpilius corallinus	Juvenile	Broken	Unknown	Brownell 1977
	Callinectes sapidus	Juvenile	Broken?	Unknown	Iversen et al. 1986
	Calappa gallus	Juvenile	Broken?	Unknown	Iversen et al. 1986
	Panulirus argus	Juvenile	see Fig.?	Unknown	Laughlin and Weil 1995, Fig1-14
		Juvenile?	Patterned breakage	Unknown	Randall 1964
		Juvenile	Breakage	Unknown	Herrera et al. 1994
Pisces	Epinephelidae, Lutjanidae, *Petrometopon cruentatum, Trachinotus falcatus, Lachnolaimus maximus, Balistes vetula, Diodon hystrix*	Juvenile (x< 80 mm)	Crushed	Unknown	Jory and Iversen 1983; Randall 1964; Brownell 1977; Laughlin and Weil 1985
	Aetobatus narinari, Dasyatis americana	Juvenile and adults	Crush all the shell	Heaps of crushed shells in 4-6 m waters	Laughlin and Weil 1985; Randall 1964; Bigelow and Schroeder 1953
	Galeocerdo cuvieri	All	Ingest whole shell	Unknown	Randall 1964
Reptilia	*Caretta caretta*	All	Crush	Heaps of crushed shells	Randall 1964
	Eretmochelys imbricata	All	Crush	Heaps of crushed shells	Laughlin and Weil 1985
Mammalia	*Tursiops truncatus*	?	?	?	Randall 1964

The damaged *botuto* shells that retain a whole columellar part are considered as *modified* and are counted for the MNI standard. It should be noted that all *botuto* shells recovered from the Trenches A and F were taken away from the excavation area for construction purposes, in the mid 1980s. I could neither examine closely the modified shells nor the fragments from these trenches. According to my records, previous to the removal of these shells, these assemblages were dominated by whole, unmodified shells. Large shell fragments were rare. However, a small but undetermined number of adult specimens had labial parts removed, and several juveniles show damage in their pre-labial parts. Such modifications of fragile juvenile parts might have happened not as a result of purposeful modification but as a consequence of throwing the shell against other shells or coral stone, during discard.

Over 98% (N=2134) of the modified shells recovered from DM were found in Trench C, where they represent 46% of all *botuto* shells (MNI). Density was also the highest, by far, in this trench (Table 20). Except for one, all modified shells from Trenches B, D and E were concentrated in the 20-40 cm level and account for 9, 5 and 28 specimens respectively. The majority of these shells are specimens of types 7 and 18 (Figure 76). In total, these two are, by far, the most popular modified types of shells and account for 75% (N=1642) of all modified shells from the DM site. The types numbered 28 to 31 and 33 to 41 inclusive (Table 14 and Figures 76 and 77) are considered as *shell fragments.* They account for 583 specimens. The most numerous group of fragments is composed of 1009 detached flared lips that account for 63% of all shell fragments (Table 15).

The above statistical configurations indicate that the activities related to meat extraction and shell modification were concentrated in the area of Trench C, while intense processing of the molluscs for food was restricted to Trench D. This separation of functionally different activity areas was apparently maintained during the consecutive utilisation (reoccupation) of the site.

Figure 75 shows an 'I wish it were always as simple as this' diagram. It is an idealised organisation of the puzzle of iconic representations of modified shells and their large fragments recovered in the DM site, into a model of technological stages oriented to the final production of a gouge (*gubia*). However, the relative frequencies of occurrence of each type, depicted in the Figures 76 and 77 show, at first glance, that the Amerindians who laboured in the Trench C area were not following the stages of reduction indicated by the model (Figure 75). Moreover, not a single finished gouge was recovered, neither in DM nor in any other late prehistoric insular site studied during this research project. The model is, however, not entirely useless. It illustrates that the particular modifications could be effected only when other specific previous stages of modification were completed.

I have not attempted to refit the modified shells with shell fragments; however, rough correlates between the morphology and abundance of certain types of modified shells and fragments are very suggestive and point out the potential of conjoining studies in understanding the formation of the DM site. For example, the representatives of the type 32 would be articulated with those of types 28-30 and 34-37 (Figures 76, 77). Could this example suggest that the assemblage from the Trench C comes from a deposit that is a result of temporally disconnected but functionally homogeneous and spatially localised types of activities?

Three types of shell fragments, the gouge- and scoop-like specimens and separated lips, merit further attention. The quantity of the specimens of types 38a and 38b is relatively high since two of these short and small gouge-like objects may be obtained from one vertically broken columella: one (38a) from the distal (a part of a type 40 on the Figure 76) and the other from the proximal (a part of a type 39) part. The breakage of the columella, is, as I observed during the experiment, an arduous task and, therefore, it is difficult to imagine that the Amerindians would do it unintentionally. The relatively high abundance of scoop-like fragments (see Figures 76 and 77, types 34, 35 and, indirectly 28, 29, 36) may indicate that the Amerindians modified certain shells to obtain a scoop-like utensil. In fact, five such objects present traces of relatively careful retouching. Could these columella fragments be interpreted as by-products of the manufacture of scoop-like utensils?

TABLE 14. ***Characteristics of modified shells and Strombus gigas shell fragments according to their natural morphological types, Trench C, DM site (see Figures 76 and 77).***

Mod.	Natural morphologic type								Perforations								
Type	J	J/A	A	A/O	O	Subtotal	?	Total	0	1	2H	2V	3	3H	4	Subtotal perforated	?
1	0	4	46	7	4	61	0	61	22	36	3	0	0	0	0	39	0
2	0	0	13	0	0	13	0	13	3	8	1	0	1	0	0	10	0
3	0	0	10	13	4	27	0	27	2	24	1	0	0	0	0	25	0
4	0	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	2
5	1	1	13	2	2	19	0	19	0	0	0	0	0	0	0	0	19
6	2	14	49	11	1	77	0	77	69	8	0	0	0	0	0	8	0
7	741	146	448	23	15	1373	0	1373	475	779	39	4	3	4	1	830	68*
8	0	3	15	3	0	21	0	21	19	2	0	0	0	0	0	2	0
9	3	10	28	7	4	52	0	52	0	0	0	0	0	0	0	0	52
10	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1
11	2	15	15	0	0	32	0	32	0	0	0	0	0	0	0	0	32
12	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1
13	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	1	0
14	0	0	2	0	2	4	0	4	1	3	0	0	0	0	0	3	0
15	0	0	1	1	1	3	0	3	0	0	0	0	0	0	0	0	3
16	0	1	1	2	0	4	0	4	2	2	0	0	0	0	0	2	0
17	1	0	3	0	4	8	0	8	6	2	0	0	0	0	0	2	0
18	72	61	85	6	12	236	0	236	116	112	8	0	0	0	0	120	0
19	0	1	1	0	0	2	0	2	1	1	0	0	0	0	0	1	0
20	0	3	2	0	5	10	0	10	9	1	0	0	0	0	0	1	0
21	0	0	5	1	1	7	0	7	3	4	0	0	0	0	0	4	0
22	0	0	1	1	0	2	0	2	0	0	0	0	0	0	0	0	2
23	0	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	2
24	0	0	4	0	0	4	0	4	0	0	0	0	0	0	0	0	4
25	0	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	3
26	2	1	12	1	1	17	0	17	0	0	0	0	0	0	0	0	17
27	7	12	43	12	7	81	0	81	0	0	0	0	0	0	0	0	81
28	0	0	4	2	0	6	0	6	0	0	0	0	0	0	0	0	6
29	0	0	5	1	2	8	0	8	0	0	0	0	0	0	0	0	8
30	0	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	2
31	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1
32	9	14	33	4	7	67	0	67	8	34	0	0	0	0	0	34	25*
33	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1
34	4	4	6	1	1	16	0	16	0	0	0	0	0	0	0	0	16
35	4	7	20	2	2	35	0	35	0	0	0	0	0	0	0	0	35
36	0	0	2	1	0	3	0	3	0	0	0	0	0	0	0	0	3
37	0	3	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
38	11	46	162	62	26	307	28	335	0	0	0	0	0	0	0	0	335
39	12	21	44	13	7	97	15	112	0	0	0	0	0	0	0	0	112
40	7	7	33	4	1	52	5	57	0	0	0	0	0	0	0	0	57
41	0	0	0	1	2	3	1	4	0	0	0	0	0	0	0	0	4
42	0	0	4	0	0	4	0	4	0	0	0	0	0	0	0	0	4
Total	878	374	1124	181	111	2668	49	2717	736	1017	52	4	4	4	1	1082	899

*apexes absent

Might they have been used, for example, in salt gathering activities? I suspect that both unknown functional and/or non-functional reasons may be hidden behind the presence of the gouge-like objects in the DM site, and still wait to be discovered (see also Armstrong 1979).

Now I turn to discuss the separated flared lips (Figure 84a) that are, by far, the most abundant specimens in the sample of modified *botuto* shell and fragments. These lips account for 63% (N=1009) of all shell fragments (N=1592), recovered in the Trench C and include three general types: entire labial parts, semi-entire and reduced lips (Figure 84). Several regular and reduced lips show clear traces of retouching left by a stone or shell tool. To simplify the present discussion all these labial types are counted together for statistical purposes. The adult and old shell specimens of the types 6, 7, 16-20 and 25-27 and 32 (Figures 75-77), may be considered as 'donors' of a total of 791 lips. The types 7 and 18 alone provided as much as 73% (N=579) of all separated lips. This evidence indicates that 22% (N=218) of lips recovered in Trench C were not separated from shells found *in situ*. Therefore, it is reasonable to suggest (1) that these lips must have been separated from shells that were discarded outside the area of Trench C, or (2) that separation took place outside this area.

From where, within the DM site, might the separated lips have been transported into the Trench C area? According to data yielded by other trenches, as well as by test pits and shovel testing, there are three possible areas. The first is in the immediate surroundings of Trench C, where shell scatters continue in all directions a few meters beyond the excavated area. The second is the Trench E area where a total of 12 lips as well as four scoop-like objects, one of them with well retouched edges, were found. However, this deposit seems to be relatively small and it is highly improbable it would supply hundreds of lips to the Trench C locus. Two lips only were recovered in Trench B while Trench D did not yield separated lips or other large shell fragments. In the assemblages of *botuto* shells from Trenches A and F, the lips were extremely scarce or entirely absent. The presence of relatively compact scatters of whole and modified shells were also detected toward the south-east of Trench C, but these small deposits could have supplied only a relatively small number of lips if, in fact, they were connected temporarily and functionally to these activities.

What contextual data could meaningfully be linked to the *botuto* shells within Trench C and beyond, in DM site? The sub-areas A, E and F yielded 76%(N=770) of all separated lips; this means that their major concentration occurred in the proximity to the hearth area (Figures 54, 56). Among 24 hearth features recovered in the Trench C a total of 18 (75%) were found in the sub-areas A and E. In general, in this trench were recovered nearly 59% of all (N=41) hearths located in DM. Toward the southern edge of the sub-areas A and E the hearths showed major horizontal concentration and vertical scatter; they lay at depths between 48 and 58 cm. This may indicate that the activities functionally linked to the hearths might have been spatially localised through time. In particular, one of these hearths, of elongated shape (Figure 56), is the most extensive feature of this type recovered from all insular sites. In reality, this is rather a conglomerate of hearth features lying at a depth of between 55 and 35 cm (measured in its thickest part) and occupying an area of over 2.5 m^2 (over 0.5 m^3 in volume). At the bottom, toward the western part of this feature, 11 perforated and three unperforated adult *botuto* shells rested in an upside down position. They were arranged in an oval shape and the shells in the external ring of this oval were originally positioned slightly higher that those in the centre, forming a sharp, distinguishable border (DM/C/FT/E; see Figure 88 and Table 16). The hearth was placed in the centre of the oval and the shells that lay just below it were so severely affected by heat, as well as compacted with ash and small shell fragments, that it was

TABLE 15. *Distribution of lips detached from the Strombus gigas shells within the areas A-F*, Trench C, DM site.*

Areas	#	A	A/O	O	Minimum length	Maximum length	Average length	Minimum thickness	Maximum thickness	Average thickness
Area A	234	152	33	49	10.5	27	18.68	0.6	4.4	2.28
Area B	98	60	21	17	7.0	26	18.53	0.6	3.6	2.44
Area C	42	24	13	5	12.8	26	20.24	1.4	3.9	2.31
Area D	99	55	20	24	12.2	26	18.33	1.0	3.7	2.41
Area E	221	156	22	43	12.5	26	18.26	0.6	3.8	2.31
Area F	315	241	33	41	12.5	26	18.66	0.4	4.3	2.44
Tot/ Av	1009	688	142	179	Av. 11.25	Av.26.16	Av.18.78	Av. 0.77	Av. 3.95	Av. 2.36

A - adult; A/O - adult/old; O old mollusc shell. *For location of the areas A-F within the Trench C see Figure 54.

impossible to extract them entire. Over and along this hearth, new hearths had continually been arranged.

It may be speculated that the long-term use of this spot for fire-making through time may be linked to that first, deepest, hearth. Several thin lenses of up to one cm thick of light grey soil (in contrast to the black, and dark grey soil of the hearth) crosscut all the large conglomerate of hearths horizontally, in short, discontinuous parallel lines. These may be interpreted as evidence of reuse of this hearth's area during an undetermined number of episodes of reoccupation of the surrounding area. The reuses of this hearth feature occurred at intervals that permitted the natural agents to (almost) bury the earlier hearths. The localised use of these hearth(s) may strengthen the interpretations of distributional patterns of *botuto* shells as resulting from patterned and functionally related activities in the area of the Trench C.

The thermally altered *botuto* shells were not exclusively found in the above described hearth feature(s). About 1.5% (N=39) of whole, 2.1% (N=45) of modified and 0.1% (N=2) of fragments of *botuto* shells found in Trench C were affected by heat. Seven shells from Trench E also bear fire marks. In this thermally altered group I include those shells that are blackened yet strong and complete, as well as those that are so heavily damaged that they disintegrate while handled. Small charred fragments of shells were often found just immediately over the hearth features in Trench C and elsewhere in DM. Certain numbers of heat-affected *botuto* shells were found in or close to several hearths in other insular sites of different cultural affiliation. Some of these shells might have been used as hearth bases while yet others might have been processed for food by putting them into (or close to) the fire. However, the evidence shows that only an insignificantly small number of molluscs were processed for food by putting the shell into the hearth, if such a technique was used at all.

At this juncture I also have to refer to other 'special' hearth features recovered in Trench C, especially in the sub-areas A and E. These are three clusters of potsherds: DM/C/FT/A-C (Figure 56; Table 16). All these features were comprised of an overwhelming majority of simple sherds and a

TABLE 16. ***The hearth features with bases of coral stone, Strombus gigas shells and potsherds, DM site.***

Trench	Code	Depth (cm)	Thickness (cm)	Shape	Dimensions (cm)	# of *botuto* shells	# of coral stones	# of potsherds Plain	Rims
A	DM/FP	20.0	Undetermined	Triangular	Length 86.0	-	24	-	-
C	DM/C/FT/A	38.0	3.0	Oval	54 x 70	-	-	107	3
C	DM/C/FT/B	37.0	2.0	Circular	Diameter 60.0	-	-	22	6
C	DM/C/FT/C	42.0	Undetermined	Circular	Diameter 60.0	-	-	40	5
C	DM/C/FT/D	47.0	2.0	Oval	25 x 38	5	-	-	-
C	DM/C/FT/E	55.0	Undetermined	Oval	24 x 105	14	-	-	-

small numbers of rim fragments. The sherds from all these features were arranged with their external, convex, surfaces up. Immediately on top of the shells of the first feature (FT/A) there were two hearths of about three cm thick each and 60 and 30 cm in diameter each. Each hearth covered only a part of the sherds' oval-shaped cluster and they did not overlap. Medium- and small-sized fragments of *botuto* shells, a few potsherds, fragments of turtle carapaces and fish vertebrae were found within and outside the hearths. About 20 cm above the upper level of one of the hearths lay a group of eight lips separated from the *botuto* shells (reduced lips). These lips pertain, almost certainly, to different temporo-spatial deposits than the sherd/hearth features, and no contextual linkage between them can be postulated. The hearth associated with the second potsherd feature (FT/B) was relatively weak and no objects other than whole and modified *botuto* shells were associated with it. The third feature (FT/C) had small patches of compact ash placed over it and extended southward, toward the complex of hearths (Figure 56). Relatively numerous turtle and fish remains, as well as two *Cittarium pica* and several *botuto* shells, were associated with it and overlaid it in a 22 cm thick layer. No other molluscs were associated with these features. The contextual associations seem to functionally link these features with some 'special' culinary activities. The overall shape of these features remind one of a marine turtle carapace. Could turtle meat have been barbecued among the pieces of live coal, on top of the sherds? Functionally, it is reasonable to expect that in this way the turtle meat (or whatever other animal), would be separated from sand and ash. Was there only a functional reason hidden behind these turtle-shaped features?

While several dozens of *botuto* lips were slightly retouched, only three of them show use-wear on their extremities that may be related to grinding. They might have been used in shell work or food processing. Regarding the spatial distribution, apart from the already mentioned cluster of eight separated lips, four other similar clusters were found in the sub-area A of the Trench C. One was composed of six, the second of five, and two other of four separated lips. Two lips deposited together or in close (x<10cm) horizontal proximity were found in several spots in Trench C; however, no specific spatial pattern could be distinguished in these depositions. Their vertical separation of about 20 cm seems to indicate that they were deposited at different times. Even though the activities linked to the detachment of the lips were carried out within and outside of the Trench C

TABLE 17. ***MNI of whole and modified natural morphological types of Strombus gigas shells, Trench C, DM site.***

Shell status	Juvenile		Adult		Old		Total	
	MNI	%	MNI	%	MNI	%	MNI	%
Whole	1103	57	953	48	479	74	2535	54
Modified	840	43	1130	52	164	26	2134	46
Total	1943	42	2083	45	643	14	4669	99

area, once the lips were detached they were accumulated within the area of this trench, at different times. They might have been brought from the immediate surroundings of Trench C, from other more distant areas of the DM site, or even from beyond Dos Mosquises Island.

Why were so many lips brought from beyond the Trench C area when plenty of complete shells were still available *in situ*? In fact, apart from the specimens whose lips had already been separated, there still were 235 specimens of modified shells (types 1-5; 8-15; 21-24; 28-31; 42; 33) and 1432 whole adult and old specimens, that would furnish as many as 1667 lips. Could not the lips of whole shells, left in the Trench C, be 'those' lips that the Amerindians were looking for? Don't they share any particular characteristic with those from which the lips were detached? The average length of modified adult shells is significantly lower (18.4 cm) than that of the whole adults (19.26 cm), indicating that lips were preferably detached from thinner shells of younger adult specimens. This evidence may suggest that the majority of undetached lips were too thick for the Amerindians purpose. This is, however, not confirmed by the data obtained from the assemblage of the separated lips. According to Table 15 even though some relatively thin lips (x=0.4 cm) were also separated, the average thickness of 2.36 cm indicates that the preferred items were adult, well formed lips. A reduced number of old and deteriorated lips, some of them as thick as 4.4 cm, were also found (Table 15). Can the relation between natural morphological types of whole and modified shells shed light on cultural preferences related to the purposes of shell modifications? As can be seen in the Table 17, nearly a half (46%) of all *botuto* shells in the Trench C were modified. The shells of adult molluscs were modified preferentially, while old shells were modified in lower frequencies. This relationship seems to confirm that adult lips were the main object of attention in the Trench C area.

Is there any functional reason that could explain the fact why some shells were left with lips, while those from other specimens were detached? Undoubtedly the uncounted interrupted acts in shell-modifying practices during the daily routine (as well as during episodes related to site abandonment episodes) may account for this phenomenon. In sum, many functional, not to mention non-functional, reasons, of unknown nature, might have influenced the abandonment of shells with lips not completely detached.

As an appropriate digression to this issue I would like to mention the information I was given

TABLE 18. ***Quantitative distribution of Strombus gigas artefacts and preforms between and within the trenches in DM site.***

Shell artefact	Trench A #	Trench A %	Trench B #	Trench B %	Trench C #	Trench C %	Trench D #	Trench D %	Trench E #	Trench E %	Trench F #	Trench F %	Total #	Total %
Discs	5	42	42	23	21	2.5	1	100	2	11	0	0	71	6
Lips	0	0	2	1	1009	95	0	0	12	67	0	0	1023	80
Other*	7	58	139	76	26	2.5	0	0	4	22	2	100	178	14
Total	12	0.9	183	14	1056	83	1	0.07	18	1.4	2	0.1	1272	

* for description of 'Other' see Table 34

by anthropologist Daniel de Barandiarán (personal communication 1992), who for several years lived with the Ye'kuana Indians of Santa Elena de Erebato, Bolívar State, Venezuela (see Barandiarán 1961). The Ye'kuana told him that they prefer the female over the male *Strombus gigas* shell for shell trumpet manufacture, since it gives a better sound. It is historically documented that the Ye'kuana undertook long-distance travel to the Guyana coasts in search of *Strombus gigas* shells for trumpets, among other items (see Barandiarán 1979; Coopens 1971).

Undoubtedly, a complex and unknown web of functional and symbolic meanings may be hidden behind this explanation given by the Ye'kuana since the male/female shells are hardly distinguishable by professionals, judging by their external characteristics alone (Appeldoorn 1988; Davis 1994). Are there any physical shell attributes that give a better sound? It seems likely that Ye'kuana 'sexed' their shells using criteria different from ours.

What do the distributional and contextual analyses of *botuto* shell artefacts found at DM add to these shell modification issues?

Worked shells

In this section I will analyse the spatial distribution of objects worked from *botuto* shell (Table 18), including shell discs (Table 19) and lips. As shown in Table 20, the density of worked shell objects is much greater in Trench B, while the detached lips are almost exclusively concentrated in Trench C. The quantitative distribution of shell discs does not show such sharp spatial differences. If we define a finished artefact as a perforated disc with borders and both surfaces polished, then only one such a disc was found in Trench B. Similar quantities of polished discs, as well as those with unfinished perforations, were found in Trenches B and C. What slightly differs between these trenches is the quantitative distribution of those discs whose borders were retouched (N=22[53%] in B and eight[38%] in Trench C) and those whose surfaces were polished (N=3 in B and none in Trench C). All these data indicate that more discs and in more advanced stages of manufacture were found in the area of Trench B than in C.

It also should be noted that the most popular discs were obtained from adult, sub-adult, juvenile and old specimens, respectively, and that the part of the shell from which the discs were extracted

TABLE 19. ***The Strombus gigas shell discs from Los Roques Valencioid sites.***

Cat. #	Disc form	Site	TP	Level	Diameter min	Diameter max.	Thickness min	Thickness max.	B T	S T	M	PS	Perforation
					CS/D site								
2196	IR	CS	D	0-20	3.5	3.9	0.5	0.8	I	E	A/O	L/CS	0
1332	IRR	CS	B	20-40	5.4	6.2	0.2	0.4	R	N	A	L/IE	0
1317	R	CS	B	20-40	3.6	3.7	0.2	0.4	P	N	J	L/UID	0
1326	R/IR	CS	B	20-40	3.9	4.7	0.3	0.5	I	N	A	L/CS	0
1330	R/IR	CS	B	20-40	2.9	3.0	0.5	0.7	R	P	A	L/SP	0
1313	R/IR	CS	B	20-40	7.1	7.5	0.3	0.6	I	N	J/A	L/E	0
1320	R/IR	CS	B	20-40	5.6	5.9	0.3	0.4	R	N	J/A	L/I	0
3114	R/IR	CS	C	0-20	3.0	3.8	0.3	0.6	I	N	J/A	L/UID	0
					DM site								
3110	IR	DM	B	20-40	4.0	4.3	0.3	0.4	I	N	J/A	L	0
3112	OV/IR	DM	B	20-40	3.6	3.9	0.4	0.7	I	N	A	L	0
2280	OV/IR	DM	B	0-20	8.4	11.0	0.3	1.1	I	N	A	L/EC	0
3111	OV/IR	DM	B	20-40	3.4	4.7	0.3	0.4	I	N	J/A	L	2*
1318	R	DM	B	20-40	3.3	3.6	0.2	0.3	P	N	J	L	2
1335	R/IR	DM	B	20-40	5.0	5.4	0.7	1.4	P	G		L/C	0
2914	R/IR	DM	B	0-20	3.4	3.9	0.2	0.6	I	N	A	L	0
1311	R/IR	DM	A	20-40	2.2	2.3	0.4	0.7	R	N	A	L/C	0
1329	R/IR	DM	A	0-20	2.9	3.0	0.2	0.5	R	N	A	L/C	0
1314	R/IR	DM	B	20-40	3.9	4.2	0.3	0.5	I	N	A	L/C	0
682	R/IR	DM	B	20-40	5.9	6.4	0.3	0.4	R	N	A	L/C	0
1306	R/IR	DM	B	20-40	4.1	4.4	0.3	0.8	R	N	A	L/CS	0
2187	R/IR	DM	A	0-20	7.3	7.8	0.3	0.7	R	N	A	L/E	0
1327	R/IR	DM	B	0-20	4.9	5.0	0.4	0.7	R	N	A	L/E	0
664	R/IR	DM	B	20-40	8.7	9.5	0.3	0.7	P	N	A	L/E	0
1333	R/IR	DM	B	20-40	4.9	5.6	0.4	1.0	R	N	A	L/EI	0
665	R/IR	DM	B	20-40	6.4	8.0	0.2	0.8	R	N	A	L/ES	0
1315	R/IR	DM	B	20-40	7.0	8.3	0.2	0.8	R	P	A	L/ES	2/1*
1307	R/IR	DM	B	20-40	3.4	3.6	0.4	0.5	R	N	A/J	L/CS	0
1316	R/IR	DM	B	0-20	5.9	6.0	0.2	0.6	R	N	A/J	L/CS	0
4515	R/IR	DM	B	0-20	4.3	4.7	0.6	1.1	R	N	A/O	L	0
2777	R/IR	DM	B	0-20	5.0	5.5	0.4	1.0	I	N	A/O	L/CS	0
1331	R/IR	DM	B	20-40	2.7	3.0	0.4	0.5	R	N	A/O	L/S	0
1325	R/IR	DM	B	20-40	4.0	4.2	0.4	0.7	P	N	A?	L	0
4277	R/IR	DM	B	0-20	1.9	2.0	0.2	0.3	I	N	J	L	0
1312	R/IR	DM	B	20-40	2.0	2.3	1.6	2.0	R	N	J	L	0
1321	R/IR	DM	B	20-40	2.3	2.4	0.2	0.2	I	P	J	L	2
4516	R/IR	DM	B	0-20	3.0	3.0	0.2	0.3	R	N	J	L	0
4517	R/IR	DM	B	0-20	3.6	3.8	0.2	0.3	R	P	J	L	3
1319	R/IR	DM	B	20-40	3.7	4.0	0.3	0.5	R	N	J	L	2
4514	R/IR	DM	B	0-20	3.8	4.0	0.2	0.3	I	N	J	L	0
1309	R/IR	DM	B	20-40	3.8	4.1	0.2	0.3	I	N	J	L	0
1308	R/IR	DM	A	0-20	6.1	6.9	0.3	0.5	R	N	J/A	L	0
1310	R/IR	DM	B	20-40	4.8	4.9	0.2	0.6	R	N	J/A	L	0
684	R/IR	DM	B	20-40	6.8	7.0	0.3	0.5	R	N	J/A	L/C	0
1322	R/IR	DM	B	20-40	3.9	4.2	0.2	0.4	R	N	J/A	L/CS	0
672	R/IR	DM	B	20-40	4.1	4.2	0.2	0.3	R	N	J/A	L/CS	0
1337	R/IR	DM	B	20-40	6.7	7.3	0.2	0.6	I	N	J/A	L/CS	0
2188	R/IR	DM	A	0-20	4.8	5.9	0.4	0.6	R	N	J/A	L/E	0
1336	R/IR	DM	B	20-40	4.5	4.5	0.2	0.5	R	N	J/A	L/E	0
1338	R/IR	DM	B	20-40	9.6	10.0	0.3	0.7	I	N	J/A	L/E	0
1334	RECT	DM	B	20-40	5.4	6.5	0.2	0.7	R	N	A	L/E	0
3206	RECT	DM	B	0-20	2.8	3.2	0.6	0.9	I	N	A/O	NLP	0
1324	RECT	DM	B	20-40	3.4	3.6	0.5	1.0	R	N	A?	L	0
3207	RECT	DM	B	0-20	3.1	4.5	0.2	0.4	I	N	J	L	0
1323	RECT	DM	B	20-40	3.4	4.1	0.6	0.7	I	N	J/A	L/E	0
1342	RECT	DM	B	20-40	4.0	4.1	0.3	0.6	I	N	J/A	L/E	0
2351	IR	DM	C	20-40	10.8	11.7	0.2	1.9	I	N	A	L/C	0
2338	IR	DM	C	20-40	9.6	12.0	0.2	1.3	I	N	A	L/EC	0
2336	IR	DM	C	20-40	11.4	13.1	0.4	0.9	I	N	A	L/EC	0
2331	IR	DM	C	20-40	9.1	11.4	0.3	0.9	I	N	A	L/ECI	0
2350	IR	DM	C	20-40	11.8	12.6	0.3	1.0	I	N	A	L/ECI	0
862	OV/IR	DM	C	20-40	12.1	14.5	0.2	1.3	I	N	A	L/EC	0
861	R/IR	DM	C	20-40	3.4	3.7	0.3	0.7	P	N	A	L	1*
2916	R/IR	DM	C	0-20	3.6	3.8	0.5	1.1	I	N	A	L	0
2889	R/IR	DM	E	0-20	4.0	4.3	0.4	0.7	I	N	A	L	0
2890	R/IR	DM	E	0-20	5.2	5.3	0.4	0.7	I	N	A	L	0

TABLE 19. (cont.)

Cat. #	Disc form	Site	TP	Level	Diameter min.	Diameter max.	Thickness min.	Thickness max.	BT	ST	M	PS	Perforation
2106	R/IR	DM	C	0-20	5.4	6.8	0.2	0.8	R	N	A	L/CS	0
893	R/IR	DM	C	20-40	7.5	7.8	0.4	0.7	R	N	A	L/EC	1*
883	R/IR	DM	C	20-40	4.5	4.6	0.2	0.3	R	N	A/J	L/S	0
2779	R/IR	DM	C	0-20	3.7	3.8	0.4	0.7	I	N	A/O	L?	0
908	R/IR	DM	C	20-40	3.7	4.1	0.4	0.6	R	N	A?	L	0
909	R/IR	DM	C	20-40	4.6	5.3	0.3	0.7	R	N	A?	L	0
2780	R/IR	DM	C	0-20	3.1	3.2	0.3	0.7	I	N	J	L	0
2825	R/IR	DM	D	20-40	3.1	3.1	0.3	0.4	R	N	J	L	0
2915	R/IR	DM	C	0-20	3.3	3.4	0.4	0.6	I	N	J/A	L	0
891	R/IR	DM	C	20-40	6.2	6.6	0.2	0.4	R	N	J/A	L/E	0
907	R/IR	DM	C	20-40	3.8	4.0	0.3	0.6	P	N	J/A?	L/E	0
892	R/IR	DM	C	20-40	4.7	4.8	0.2	0.5	R	N	J/A?	L/S	0
2107	RECT	DM	C	0-20	3.9	4.9	0.3	0.7	R	N	A?	L/E	0
860	RIR	DM	C	20-40	3.0	3.4	0.2	0.3	P	N	J	L	0
					KR site								
1036	R/IR	KR	A	20-40	4.2	4.3	0.3	0.7	I	N	A	L/CS	0

Abbreviations: Cat.# - catalogue number; TP - Trench or test Pit; BT - border treatment; ST - surface treatment; M - morphological stage of mollusc from which shell the disc was made; PS - part of the shell from which the disc was made; Perf. - artificial perforations. Forms: IR - irregular, R - round, R/IR - round/irregular, OV/IR - oval/irregular, RECT - rectangular. Border_treatment: R - retouched, P - polished, I - irregular. Surface treatment: P - polished, N - natural. Morphological stage: J - juvenile; J/A - subadult; A - adult; A/O - adult/old; O - old. Shell fragment: L/S - superior labial part, L/C - central labial part, L/CS - superior-central labial part, L/I - inferior labial part, L/EI - labial inferior border, NLP - no labial part, L/EC - labial central border, L/ECI - labial central inferior border, G - grounded. Perforations: 1,2 - one or two perforations, 1* or 2* - one or two unfinished perforations, 0 - no perforated.

was, preferably, the central labial part located toward the exterior border of the lip (Table 19). If the labial parts were detached and reduced to disc preforms within the area of Trench C, then, several dozens of lips had to be brought to Trench C from outside.

The above data indicate that *botuto* shells were processed as a raw material in Trench C mainly to obtain lips and disc preforms, but that the finer shellwork, as well as the storage of smaller, more elaborated shell objects, was instead concentrated in the area of Trench B. The data suggest that the shell-makers carried out finer and more advanced stages of work in Trench B. However, the large proportion of unfinished or damaged specimens and almost lack of complex, finished shell adornos in DM may indicate the reduced scale of the *in situ* shellwork. It may be also indicative of the Amerindian's objective, taking lips as preforms from the island to be worked elsewhere (mainland?).

These conclusions do not yet exhaust the full potential of the information that may be elicited from the *botuto* shell assemblages in the DM site.

Selectivity or randomness?

Were the Amerindians selecting certain natural morphological types of shells or collecting them randomly? To answer this question one is tempted to examine whether the archaeological shell assemblages match or not the frequencies of occurrence of the natural morphological types as found at present in their habitats (see Keegan 1982: 79). However, the assumption about the direct relationships between the two sets of data is not a secure basis upon which to develop archaeological inferences. The pertinent ecological data, even though easily available in the specialised literature (i.e. Alcolado 1976; Laughlin and Weil 1985; Ferrer and Alcolado 1994), were not obtained in

TABLE 20. ***Characteristics and densities (number of items per one cubic meter of cultural deposit) of the <u>Strombus gigas</u> shells, shell artefacts and preforms from Trenches A-F, DM site.***

Trench	MNI #	MNI density	Unmodified shells density	Modified shells density	Discs density	Worked shell density	Lips density
A	365?	9.7?	9.7	?	0.1	0.2	0
B	245	18.8	18.3	0.5	3.2	10.6	0.15
C	4669	124.5	67.7	57	0.6	0.7	26.9
D	1248	312	311.2	0.75	0.25	0	0
E	125	78	63.7	14.3	1.25	2.5	7.5
F	44?	36.6?	44	?	0	1.6	0
Tot/Av	6696	96.6?	85.7	18 1	1.08	3.2	11.5

studies whose time-depth may be compared to the time archaeologists have to confront. The frequency of the different types in the natural habitat depends on the success of every particular season of reproduction and, therefore, may vary seasonally. The tropical storms, hurricane tails and other natural agents that operate on the islands may considerably alter the overall composition of the stock (see Blair et al. 1994).

The patterns of type-occurrence may vary spatially from one sub-area to another, even within the same study zone (i.e. Los Roques Archipelago). On the other hand, the deposits of *botuto* shells in Dos Mosquises and in other islands are, almost certainly, not a product of a 'flash-in-time' episodes but rather accumulations to which the shells were added, subtracted or reorganised (vertically and horizontally), during successive visits. Even if we could demonstrate that a particular *botuto* heap was created during the time of duration of one particular visit, the shells that compose it might have been collected in different natural environs and during different seasons of the year.

For example, is the overwhelming predominance of juveniles in Trench D (Table 12) a reflection of cultural selection or of molluscs that were randomly gathered in the site's surrounding waters? It may be argued that these data suggest that the creators of this heap, who probably pertained to the first wave of Amerindian visitors to the island, took advantage of the 'virgin' natural populations of *botuto*. Large and relatively stable through time, aggregations of juvenile molluscs in shallow waters with bottoms covered by *Thalassia testudinum* were reported from many areas of the Caribbean (i.e. Hesse 1979; Stoner et al. 1994; Rathier and Battaglya 1994). In the area of Dos Mosquises Island, the juvenile specimens inhabit mainly the shallow water beds between 0.5 and one meter in depth (Laughlin and Weil 1985). They could easily be collected there by Amerindians wading in groups or individually, regardless of sex and age. Adult molluscs live predominantly in depths between four and eight meters (Laughlin and Weil 1985) and could be accessed near the shore by an individual diver or by at least a two-person co-operating team with the use of the canoes. In Alcolado's (1976) report, the juvenile individuals accounted for the majority while the adult individuals constituted 33.16% of the total population. In fact, the frequency of occurrence of natural types of *botuto* in Trench D roughly matches those of these modern studies. Given that the shells show great morphological homogeneity along the vertical dimension of the Trench D heaps, my guess is that they may, in fact, represent the results of the exploitation of the virgin *botuto* populations carried out during consecutive events close in time. In other words, the composition of these deposits is probably the result of opportunistic, non-selective gathering. This supposition may still be followed further. It is known that a massive migration of adult *botuto* individuals from the deeper waters, to copulate and deposit eggs in the shallow sandy bottoms, begins in April and lasts for a few consecutive months, each year (Laughlin and Weil 1985). The target of these movements are these same bottoms that, during the rest of the year, are dominated by the juveniles. Were the molluscs from Trench D collected during the months prior to and after the reproductive season, when the juveniles dominated the arena?

Regardless of how attractive the above suggestions might be, I should emphasise that the high frequencies of juveniles in Trench D may also be a result of cultural selection because, for example, of the juvenile's more tender flesh or easier-to-perforate shells. Undetermined functional or non-functional reasons might have also influenced the final composition of this shell deposit. Finally, the lack of any functional relationship between the upper segments of the Trench D heaps and other *botuto* shell deposits in DM site is not yet firmly established.

The on-shore deposited assemblages from Trenches A and F, as well as the inland deposit from Trench E, show compositions that, if treated as a whole, also grossly match the natural populations dominated by juvenile individuals (Tables 12, 21). Therefore, they may also indicate the opportunistic, non-selective exploitation of the molluscs. However, to determine whether or not the proximity to the seashore is positively co-related to the large quantity of discarded juvenile shells, I excavated four test pits (1 x 1 m) to the north-east of Trench D (Figure 30, 1K-4K), assuming that, according to my previous arguments, these shells might have been discarded on or close to the palaeoshoreline. These assemblages yielded very similar proportions of juvenile and adult specimens (N=116 and 108 respectively; see Table 26); old individuals and unperforated shells were absent and few of the shells were modified. The lack of unperforated shells and old individuals relates these assemblages to those from Trench D (unifunctional specialised mollusc processing). At the same time the high proportion of adults and the presence of modified shells is similar to the compositions of the assemblages from Trench C.

How can we interpret the composition of the assemblages from Trenches B and C, which are distant from the shore? In the latter trench the adult specimens are slightly more numerous than the juveniles and the importance of old individuals is accentuated (Table 21). In Trench B these characteristics are even more emphatic: the adults clearly dominate the assemblage with an important proportion of old specimens. These compositions may be the results of cultural selectivity, for food and/or as a raw material, of the *botuto* molluscs. However, it may also be argued that the

TABLE 21. ***Distribution of natural morphologic types of Strombus gigas whole (W) and modified (M) shells in Trenches B-E, DM site.***

Nat. type	Trench B W	M	MNI	%	Trench C W	M	MNI	%	Trench D W	M	MNI	%	Trench E W	M	MNI	%
J	68	6	74	30	1103	840	1943	42	1017	0	1017	81	73	19	92	71
A	145	3	148	50	953	1130	2083	45	225	5	230	18	21	8	29	22
O	25	0	25	10	479	164	643	13	3	0	3	0.2	8	1	9	7
Total	241	9	250		2535	2134	4669		1245	5	1250		102	28	130	

J - juvenile; A - adult; O - old

shells from these deposits were collected precisely during the migrations and congregations of adult individuals during the reproductive phase (see above). It might have also been the case that the natural populations of juveniles from the inshore shallow waters was overexploited, obliging the Amerindians to dive into the deeper water habitats where the adults dominate. I will discuss these questions in the sections which follow.

Expert 'botuteros' or greenhorns?

About 6.5% (N=170) of all whole and modified perforated shells recovered from Trench C show more than one perforation in their spires. These indicate that one in 15 perforated shells was not opened correctly at the first attempt. In several specimens, a second, third and even fourth hole had to be opened until the individual finally hit the correct spot where the attaching muscle could be reached and cut. In 87% (N=142) of all multiple perforated shells the Amerindians rectified the first miss with a second perforation located over, below or alongside the first try. The shells with three (10.5%; N=18) or four holes (2.3%; N=4) are exclusively juveniles and adults (Table 22).

These figures do not in fact indicate that juvenile and adult specimens were the most problematic to open at first attempt. They account for 89% (N=2365) of all whole and perforated shells from Trench C, leaving no opportunity to compare them with a similar quantity of old perforated specimens. The hole punched through the shell (to reach the muscle that is severed to release the animal) must be positioned very precisely. If it is wrongly located, a second hole has to be made.

The mishits from Trench C show interesting pattern which demonstrates this problem. Where more than one hole is present, in 144 cases the erroneous first attempt was misplaced 'horizontally'(i.e. at the wrong point around the circumference of the spire), and in only 17 instances was misaligned 'vertically' along the axis of the shell. Evidently the Amerindians had greater difficulty locating the correct striking-point in the horizontal dimension that in the vertical/longitudinal one. Experiments suggest the reasons for this. I have personally observed that it is much easier to remember the vertical location of the striking-point, since the consecutive sutures, or channelled lines, at the juncture of each whorl with its neighbour (Abbott 1974: 9), divide the

TABLE 22. ***Multiple perforations on different natural morphologic types of whole and modified Strombus gigas shells in Trench C, DM site.***

Number of perforations	J	J/A	A	A/O	O	Total
2 perforations horizontal	34(18)	1(5)	37(33)	3(1)	4	79(52)
2 perforations vertical	3(2)	3(2)	3(2)	2	2	13(4)
3 perforations horizontal	9(9)	-	(1)	-	-	9(4)
3 perforations mixed	-	-	1(1)	-	-	1(4)
4 perforations mixed	1	-	2(1)	-	-	3(1)
Total	47(29)	4(7)	43(38)	5(1)	6	105(65)

In brackets are modified shells, see also Table 17

spire horizontally and give a visible reference by which to locate the perforation spot. Similar points of horizontal reference, within a single whorl around the spire, are absent, and fixing the correct spot in this dimension is more difficult. Errors in locating the striking-point vertically never transgressed by more than one suture of the spire (Tables 22 and 23).

Were the shells from Trench C more frequently multi-perforated than those from other areas of the DM site? To address this question I will use comparative data of whole multi-perforated shells from Trenches B, C and D, since no such shells were found in Trenches A, F and E. In Trench B, only two shells (or 2.1% of all whole perforated shells) were multiply perforated, while seven (0.6%) were identified in Trench D. Trench C shows markedly higher figures of 6.7% (N=105) of multiple-perforated whole shells and a similar figure of 6.0% (N=65) of multiple-perforated modified shells.

TABLE 23. ***Distribution of whole multi-perforated Strombus gigas shells between Trenches B, C and D, DM site.***

Types of perforations	Trench B			Trench C			Trench D			Total
	J	A	O	J	A	O	J	A	O	
2 perforations horizontal	2	-	-	34	38	7	3	3	-	87
2 perforations vertical	-	-	-	3	6	4	1	-	-	14
3 perforations horizontal	-	-	-	9	-	-	-	-	-	9
3 perforations mixed	-	-	-	-	1	-	-	-	-	1
4 perforations mixed	-	-	-	1	2	-	-	-	-	3
Total	2	0	0	47	47	11	4	3	0	114

Let me transform these comparative data into yet more suggestive figures. While the Amerindians who operated in the Trench C were erring once every 15 shells (including whole and modified specimens), those from the Trench D erred once in every 171 shells. Why were the shells in the area of Trench C perforated with so much less precision? Can we hypothesise that the Amerindians processing the large numbers of shells in the heap area of Trench D were more experienced in their task than those working in the area of Trench C? Can this evidence indicate that the people processing the molluscs in these two areas were socio-culturally different? In other words, could it reflect the difference between the 'pre-Valencioid' and Valencioid 'peoples'?

Based on the evidence, certain molluscs used for culinary purposes were transported to, and discarded in, inland areas (Trenches B, C and E), while others, also used for food, were processed

TABLE 24. ***Whole <u>Strombus gigas</u> shells from the areas A-F within Trench C, DM site.***

Shell status	J	J/A	A	A/O	O	Total
			Area A			
Whole (no perforated)	329	32	61	2	6	430
1 perforation	258	83	272	6	16	635
2 perforations H	16	1	20	1	1	39
2 perforations V	3	2	3	-	-	8
3 perforations H	3	-	-	-	-	3
3 perforations mixed	-	-	1	-	-	1
4 perforations mixed	1	-	-	-	-	1
Subtotal	610	118	357	9	23	1117
			Area B			
Whole (no perforated)	10	3	4	-	-	17
1 perforation	34	1	11	-	1	47
2 perforations H	3	-	-	-	-	3
Subtotal	47	4	15	-	1	67
			Area C			
Whole (no perforated)	17	2	4	-	-	23
1 perforation	33	10	18	-	-	61
2 perforations H	3	-	3	-	-	6
Subtotal	53	12	25	0	0	90
			Area D			
Whole (no perforated)	30	-	11	6	15	62
1 perforation	85	8	35	5	8	141
2 perforations H	2	-	4	2	-	8
2 perforations V	-	1	-	-	-	1
3 perforations H	1	-	-	-	-	1
Subtotal	118	9	50	13	23	213
			Area E			
Whole (no perforated)	57	5	61	23	97	243
1 perforation	86	19	111	21	85	322
2 perforations H	5	-	6	-	2	13
2 perforations V	-	-	-	1	1	2
3 perforations H	3	-	-	-	-	3
4 perforations	-	-	1	-	-	1
Subtotal	151	24	179	45	185	584
			Area F			
Whole (no perforated)	54	5	51	23	80	213
1 perforation	63	15	84	21	53	236
2 perforations H	5	-	4	-	1	10
2 perforations V	-	-	-	1	1	2
3 perforations H	2	-	-	-	-	2
4 perforations	-	-	1	-	-	1
Subtotal	124	20	140	45	135	464
Total						2535

and discarded on the seashore (Trenches A, F and D). The large quantity of perforated *botuto* shells and their spatial associations with hearths and food remains suggest that the activities in the area of Trench C might have been, in part, dedicated to processing these molluscs for culinary purposes. Even though the perforated shells were discarded throughout all the area of Trench C, they were particularly abundant in sub-areas A and E, where the extension of hearths was greatest (Table 24; Figures 54 and 56). In just two areas of Trench C 67% (N=1701) of whole *botuto* shells were found. These areas also concentrate 66% (N=1547) of all the perforated shells and as much as 67.6% (N=71) of all the multiple perforated shells.

Could these differences in spatial distribution reflect a sex/age division of labour? The differential distribution of the shells, especially between Trenches C and D, may indicate that while the men were processing large quantities of molluscs for preservation and future consumption on the seashore, the women and/or children were processing the molluscs in the area of the Trench C, for immediate culinary purposes. As already stated, I am rather inclined to regard these two deposits (Trenches D and C) as depositional units separated in time. Let us, however, continue the 'interrogation' of the data in search of additional arguments to verify this last hypothesis. Can we suppose that, unlike their near-shore counterparts, the meat from inland-discarded shells were used for immediate consumption and/or for other non-culinary purposes, while the on-shore shells were discarded during large-scale processing for delayed consumption? Could I finally suggest that an unknown symbolic use of space might have underlain the spatial distribution of *botuto* shells within the DM site? What are other particular characteristics that inland deposited shells do not share with their counterparts on the seashore?

'Perforators'

During previously mentioned experiments I observed that certain natural morphological *botuto* shell types are naturally well suited to serve as tools to perforate other shells during the meat extraction process. The archaeological shells whose apex tips were worn and rounded by use were macroscopically analysed and compared to their modern counterparts. The similarities in use-wear pattern were striking. Therefore, I assume that archaeological specimens showing this pattern were used for crushing shells. I named them *perforators* since I consider that they were mainly used to perforate shells (by percussion rather than by drilling) during processing for culinary purposes (see also de Booy 1915; Keegan 1982). However, these perforators might have been multipurpose tools used also for crushing shells for non-culinary purposes, i.e. during the manufacture. In fact, several *botuto*, and a few *Melongena melongena* shells, show patterns of modification that might have been a result of use of a shell as a hammer/chisel in an activity whose purpose seems to be distinct from that of meat extraction (Figures 82 and 83). Lithic hammer/chisel tools that may have been used for these modifications were not found (see 'Lithic Artefacts' in this chapter).

Tables 27 and 28 show that over 88% (N=364) of whole and 11.6% (N=48) of modified shells were used as perforators in Trench C. These data seem to indicate the preference for whole shells for perforators; however, we do not know whether the latter were modified before or after their use as perforators. If, in fact, whole shells were preferred, then this preference may be positively related to the weight of the utensil; a heavier shell is more effective for hammering, as I noted during my experiments. Over 70.8% (N=34) of the modified shell perforators pertain to type 18, which is a shell with the labial part completely removed (Figure 76). This may indicate that the lips were purposefully detached in shells used as perforators; the benefits of such an operation I noted during the experiment. It is probable that these modified shell perforators which were lighter, safer and easier to manipulate were used for fine-grained shellwork. Could it be supposed that some shells

TABLE 25. ***Spatial distribution of the*** ***<u>Strombus gigas</u>*** ***shell perforators (whole shells) from different excavation units within the DM site.***

Trench/Pit	Total perforated shells	Total perforators	Number of shells perforated by one perforator	Percent of juvenile specimens used as perforators
Trench C	1830	284	6.4	76
Trench D	1201	123	9.7	61
Trench E	86	16	5.3	62
Pits 1K, 3-4K	178	25	7.1	96
	Total 3295	Total 448	Average 7.13	Average 73.75

might have been especially modified to be used as light perforators handled by women and/or children?

Both whole and modified shell assemblages in Trench C show the same structure regarding the use of particular natural morphological shell types for perforators. The preferred specimens were juveniles that account for 74% (N=270) in the assemblage of whole shell perforators and 37.5% (N=18) among the modified. Adults account for 16.2% (N=59) and 31% (N=15); sub-adults for 8.5% (N=31) and 27% (N=13). Less popular were the old specimens, accounting for 1% (N=4) and 8.3% (N=4) respectively (Tables 27 and 28). As I already noted experimentally the heavy old specimens may be viewed as good perforators; however, the tips of their apexes are naturally smoothed and flattened, instead of acute as in the juveniles and adults.

TABLE 26. ***Characteristics and spatial distribution of the*** ***<u>Strombus gigas</u>*** ***shell and shell perforators in Pits 1K and 3-4K, DM site (see also Figure 30).***

Pit 1K Juvenile			Pit 1K Adult			Pit 3K Juvenile			Pit 3K Adult			Pit 4K Juvenile			Pit 4K Adult		
1P	0P	Perf.	1P	0P	Prf.	1P	0P	Prf.	1P	0P	Prf.	1P	0P	Prf.	1P	0P	Prf.
73	0	21	61	0	16?	8	0	2?	20	0	3?	9	0	3	7	0	1

Perf. - perforator; ? - possible perforator

Over 74% (N=270) of whole shell perforators were perforated and 2 5% (N=94) unperforated; over 64.5 (N=31) of the modified shell perforators were perforated and 35.4% (N=17) unperforated. In total 73% (N=301) of all perforators were perforated, indicating that the use of molluscs for food did not preclude the subsequent use of shells as perforators. In other words, the perforators might have been deliberately chosen from the same shells that were collected for food. The determination whether the meat from the molluscs whose shells were used as perforators was extracted before their use as tools or after is; however, unachievable. It may be supposed that shells with the animal inside might have been preferred as men's perforators given their greater weight.

The preference for juvenile shells, that accounted for 67% (N=288) of all perforators, is evident. Had the Amerindians favoured juvenile shells of a particular length for use as perforators?

TABLE 27. ***Morphologic characteristics of <u>Strombus gigas</u> shell perforators (whole shell) from areas A-F within Trench C, DM site.***

Shell status	J		J/A		A		O		Total
	Y	?	Y	?	Y	?	Y	?	
			Area A						
Whole (no perforated)	20	23	4	5	1	8	-	-	61
1 perforation	48	21	8	-	16	5	1	-	99
2 perforations V	-	-	-	1	1	-	-	-	2
2 perforations H	6	1	-	-	1	-	-	-	8
3 perforations H	-	1	-	-	-	-	-	-	1
3 perforations mixed	-	-	-	-	-	1	-	-	1
Subtotal	74	46	12	6	19	14	1	0	172
			Area B						
Whole (no perforated)	-	1	-	-	-	-	-	-	1
1 perforation	10	4	-	-	1	-	-	-	15
2 perforations H	2	1	-	-	-	-	-		3
Subtotal	12	6	0	0	1	0	0	0	19
			Area C						
Whole (no perforated)	-	1	-	-	-	-	-	-	1
1 perforation	6	4	1	-	-	2	-		13
2 perforations H	-	1	-	-	-	-	-	-	1
Subtotal	6	6	1	0	0	2	0	0	15
			Area D						
Whole (no perforated)	3	-	-	-	-	2	-	-	5
1 perforation	23	2	2	1	-	2	-		30
2 perforations H	-	-	-	-	-	-	-	-	0
3 perforations H	1	-	-	-	-	-	-	-	1
Subtotal	27	2	2	1	0	4	0	0	36
			Area E						
Whole (no perforated)	8	2	-	-	-	6	-	-	16
1 perforation	43	3	5	1	2	5	1	1	61
2 perforations H	1	1	-	-	-	-	-	-	2
3 perforations H	1	-	-	-	-	-	-	-	1
Subtotal	53	6	5	1	2	11	1	1	80
			Area F						
Whole (no perforated)	5	2	-	-	-	3	-	-	10
1 perforation	20	3	3	-	1	2	-	1	30
2 perforations H	1	1	-	-	-	-	-		2
Subtotal	26	6	3	0	1	5	0	1	42
Total	198	72	23	8	23	36	2	2	364

J - juvenile; J/A - subadult; A - adult; O - old; Y - the use wear indicates clearly that the apex's tip was used in grinding or hammering; ? - the tip is freshly broken indicating the shell might have been used as perforator but the evidence is not conclusive.

All whole shell perforators (N=246) were measured, and gave the average length of 16.51 cm. It is noteworthy, however, that all average perforator's lengths from areas A-F of Trench C ranged between 16.25 and 16.84 cm, indicating that the great majority of perforators were juveniles of that very precise length.

How many shells might have been perforated by one Amerindian perforator within Trench C? One shell with clear use-wear traces on the tip of its apex (Table 25) was used to perforate an average of 6.4 shells. How do the above data from the Trench C relate to those from other excavation units within the DM site? As can be seen in the Table 25 the shells of juvenile molluscs were consistently preferred as perforators all over the DM site. This preference was also confirmed by the shell assemblages from three of the four pits excavated to the north-east of Trench D (Table 26; Figure 30). The average of between 5.3 to 6.4 shells were opened by one perforator, in all but one trench. This exceptional trench is Trench D, where as many as 9.7 shells were opened by each perforator (Table 25). Does this evidence strengthen the previous assumptions that the mollusc

TABLE 28. *Spatial distribution of modified Strombus gigas shells used as perforators in Trench C, DM site.*

Shell status	J		J/A		A		O		Total
	Y	?	Y	?	Y	?	Y	?	
				Area A					
1 perforation	2(18)	-	-	-	-	-	-	-	2
Subtotal	2	0	0	0	0	0	0	0	2
				Area B					
Unperforated	3(18)	-	-	-	-	-	-	-	3
1 perforation	-	-	-	-	1(1)	-	-	-	1
Subtotal	3	0	0	0	1	0	0	0	4
				Area C					
Subtotal	0	0	0	0	0	0	0	0	0
				Area D					
Unperforated	-	-	-	-	-	1(1)	-	-	1
	-	-	-	-	-	1(14)	-	-	1
1 perforation	-	-	-	1(7)	1(6)	-	-	-	2
					1(3)				1
Subtotal	0	0	0	1	2	2	0	0	5
				Area E					
Unperforated	1(18)	-	-	-	-	-	-	-	1
1 perforation	2(18)	-	-	-	1(32)	1(32)	-	-	4
Subtotal	3	0	0	0	1	1	0	0	5
				Area F					
Unperforated	-	1(18)	1(32)	1(18)	-	-	-	1(18)	4
	2(18)	-	-	-	2(18)	-	-	-	4
	1(18)	-	-	-	1(32)	-	-	-	2
	1(18)	-	-	-	-	-	-	-	1
1 perforation	2(18)	-	3(18)	3(18)	2(18)	1(18)	-	1(18)	12
	1(3)	-	1(32)	-	1(6)	-	-	-	3
	1(18)	-	3(18)	-	-	-	-	-	4
2 perforations H	1(32)	-	-	-	1(18)	-	-	-	2
Subtotal	9	1	8	4	7	1	0	2	32
Total	17	1	8	5	11	4	2	2	48

Y - the type of damage of shell apex indicates it was surely used to hammer some semi-hard materials, it is considered as perforator; ? - the pattern of apex's damage indicate that the shell might have been used as perforator. In brackets is given the modified type number.

processing in this area was routinised and carried out by skilful individuals, and that these shell heaps are relatively quickly accumulated unifunctional deposits? Additionally, the percentage of juvenile specimens used as perforators is the lowest in this trench, indicating that more heavier sub-adults and adults were used as perforators there. It should be remembered that these shell deposits also showed a lower number of multi-perforated shells, which may be considered as another proof of high level of skill and efficiency.

The above evidence gives rise to other questions. Why do the characteristics of archaeological perforators not match those of their experimental counterparts? During the experiment, I found that the shells of sub-adult and adult individuals, between 18 and 21 cm in length, were the most effective and durable perforators. One adult specimen of 25 cm in length

permitted me to perforate 23 shells until its apex became round and ineffective. Why were juvenile specimens of a length below 17 cm preferred by the Amerindians? Was there an insufficient quantity of adult specimens? Certainly not, as may be seen in Table 12. I suggest that the shells were used as tools not only in the process of meat extraction, but also in shell modification for non-culinary purposes, and these multiple functions probably account for the differences between archaeological and experimental samples.

TABLE 29. *Nutritional values of Strombus gigas, beef, chicken and pork meats, calculated in dry weight.*

Nutritional information	Unit of measure	*Strombus gigas* [1]	Beef [2]	Chicken [2]	Pork [2]
Protein	%	60.8	74.2	61.4	58.7
Fat	%	1.8	17.8	34.7	37.8
Minerals	%	24.9	4.4	4.0	3.5
Phosphorous	g/kg	3.51	7.3	6.1	7.0
Iron	g/kg	0.13	0.1	0.04	0.06
Copper	g/kg	0.07	-	-	-
Calcium	g/kg	3.84	1.0	0.4	0.2

Sources: 1. Fundación CIEPE, San Felipe, Servicio Tecnológico # 16387, analyses contracted by the author, 21.09.1987; 2. Tabla de Composición de Alimentos para Uso Práctico, (Revisión 1983), Ministerio de Sanidad y Asistencia Social e Instituto Nacional de Nutrición. Publicación N° 42, Serie Cuadernos Azules, Caracas

These discrepancies may also be related to physical-chemical shell properties, human skill variation and/or context of work. Certain undetermined non-functional reasons may have ruled the selection of perforators from shells collected in special temporal/spatial contexts or with certain, natural internal (animal) or external (shell) characteristics. The socio-cultural differences differentiated efficiency in mollusc processing between sexes and or ages, between experienced and inexperienced labourers, and between people who worked in peace and those who worked under stress or in a hurry. Finally, I suppose that certain as yet undefined rules also governed the processing of molluscs for immediate subsistence, in contrast to those ruling preservation for delayed consumption (i.e. objectifications of the oppositions encoded in the concept of 'to kill for food and to kill for trade').

Dietary considerations

Even though we still do not know how the contribution of the *botuto* to the diet of the Valencioid visitors to Dos Mosquises Island is related to these of other marine resources, there is no doubt that it had to be considerable. However, precise determination of this contribution is an unrealisable goal. How can we determine how many unperforated, both whole and modified shells, might have, or have not, been considered as food-related items? The overall volume of meat processed for immediate (*in situ*) and/or delayed (preserved and shipped beyond the islands) consumption by the socio-culturally different occupants of the DM site cannot be inferred from the archaeological record. An unknown quantity of molluscs might have been processed beyond the site and DM island, and their flesh brought to the site for consumption/preservation. Salting and sun drying of *botuto* meat is still a widespread practice among the Los Roques fishermen (information obtained from Teobaldo Salazar 1983) and it has been demonstrated that it is a successful strategy for storage and transportation of mollusc meat (Henshilwood et al. 1994; see also Ninnes 1994:68, for data about dried *Strombus gigas* meat export from Turks and Caicos Islands to Haiti). Additionally, the volume of exploited molluscs might have varied from one occupational episode to another as well as from the first stages of the 'discovery' and installation in the Archipelago, to

TABLE 30. ***Estimated catch of the Strombus gigas molluscs per man/day in different areas of the Caribbean between 1960s and 1980s*.***

Area	Use of boat	Quantity of collected molluscs	Reference
Los Roques	1 boat	233**	Laughlin and Weil 1985
Los Roques	2 boats	250**	Laughlin and Weil 1985
Los Roques	1 boat	120**	Posada et. al 1988
Grenadines	1 boat ?	180**	Adams 1970
Turks & Caicos	-	600	Hesse and Hesse 1977
Caicos Bank	?	277	Nninnes 1994

* All data refers shells collected by diving at the depths of about nine metres. ** The real yields are larger than shown in this Table since during the conversion of the original data the total amount has been divided by the number of crew of the boat despite the fact that not all crew members participate in mollusc collection.

further stages of the explorations and exploitation of the islands' resources. As already discussed, the separation of the deposits that correspond to the different occupational episodes at DM is blurred.

Table 29 shows the remarkable nutritional values of the *botuto* meat in comparison to those estimated for chicken, beef and pork. It is noteworthy that the low frequency of cases of copper-deficiency and poliomyelitis reported among those native Bahamians whose diet was based on *botuto* meat, was related to its high content of assimilable copper (Randall 1964; Anonymous in Acosta 1994: 329).

Using the allometric formula provided by Laughlin and Weil (1985) that permits to estimate the flesh of *botuto* mollusc from the siphonal length of its shell I calculated that 2535 whole perforated and unperforated shells in the Trench C contributed with 266.853 kg of meat (Table 31). However, it is very suggestive that the molluscs processed in Trench D yielded as much as 18.6% (ca. 131 kg) of all meat that might have been extracted from shells (based on the total MNI number) in DM site (573.5 kg.). The volume of *botuto* meat per cubic meter excavated in this purported 'pre-Valencioid' cultural deposit (Trench D) is of 46.8 kg, while in all Valencioid deposits together (Trenches A-C, E, F) this figure accounts for 6.9 kg/m^3 only. It is not my intention to go deeper into dietary calculations; however, I would like to highlight the potential of such a valuable resource on the economy, social complexity and politics of the prehistoric societies of north-central Venezuela.

Let me use some modern ethnographic data to roughly assess the human effort involved in the exploitation of *botutos* and to illustrate the value of these data to the interpretation of the prehistoric realities. Table 30 shows the maximum sustainable catch of *botuto* mollusc per man/day in different areas of the Caribbean. These figures are not the highest reported in the area since Hesse and Hesse (1977) reported that one efficient diver could collect as many as 100 molluscs in half an hour from depths over nine metres in Turks & Caicos Islands. In the shallow waters of Dos Mosquises Island a crew of a boat (3-5 persons) could collect, without diving, as many as 700-1000 molluscs during half a day (this information, which refers to the 1970s was obtained from Pablo Mata and Felipe Salazar, 1982-1985). The data indicate that in one day 3-5 men could collect over 300 kg of highly nutritive meat! For this reason I consider the *botuto* mollusc should or can very appropriately be called 'the fruit of paradise'.

TABLE 31. ***Average, maximum and minimum whole Strombus gigas shell (2535 specimens) lengths and weights of flesh from sub-areas A-F within Trench C, DM site.***

Shell/flesh measure-ments	Area A L	W	Area B L	W	Area C L	W	Area D L	W	Area E L	W	Area F L	W
Average	18.0	88.2	18.3	87.5	19.3	102.2	19.3	105.6	20.4	126.1	20.3	123.2
Maximum	26.2	295	24.5	221	24.3	213	27	338	27.5	368	27.0	338
Minimum	8.0	13	11.5	24	14	37	10.5	20	10	19	10.0	19
Total		98456		5865		9202		22509		73640		57181

L - length in centimetres; W - weight of animal flesh in grams

The above discussion has a direct bearing on interpretation of the archaeological *botuto* shell deposits, even though it may certainly be argued that the Amerindian *botuteros* were not working to fulfil modern market demand. I will argue that the molluscs specified in Table 30 were almost exclusively collected by diving, while the Amerindian populations could have taken advantage of shallow water dense populations, easily accessible by wading. Using the figure of 120 *botutos* as an average one-man catch per day, which is the lowest average reported for modern Los Roques fishery (Table 30), it can be estimated that all the *botuto* shells from the Valencioid deposits within the DM site (MNI=6696) could have been collected by two men in less than a month. However, were such a quantities of molluscs available in Dos Mosquises
Island waters? *Botutos* may be collected everywhere around the island; however, the ideal habitats and, therefore, major densities of *botutos* have been reported from sea-grass bottoms, toward the south-eastern shores. These shallow waters between 0.1 and 1.0 m in depth cover an area of ca. 3400 m^2 (Pulido 1983) with average densities of 0.5 *botutos*/m^2 (Weil and Laughlin 1984). This indicates that 1700 molluscs could have been collected from this area by wading, on a single occasion. In consequence, all 1245 molluscs from Trench D could have, in theory, been collected from this area during a one day episode, by a few people.

The heaps and scatters of *botuto* shells in Dos Mosquises Island site are only minor elements of the insular landscape in comparison to the large mega-middens located on other islands of the Los Roques Archipelago. An unknown part of these middens is undoubtedly of prehistoric origin. In the light of the above considerations, these mega-middens should not necessarily be seen as the products of very long-term successive accumulations resulting from *botuto* fishery. They may be alternatively seen as the remains of a relatively short-time intense exploitative efforts.

Functionality and beyond

The *botuto* shells from the Los Roques Islands were used as raw material for adornos and utensils, as hearth bases, and as naturally pre-worked tools. They might has also been used for manufacture of shell trumpets. The Amerindian use of these signal instruments has been reported from Mesoamerica (Suárez 1977), Greater Antilles (Maggiolo 1972: 224), Venezuela (Alvarado

1945: 144) and the Central Andean region. They were used as signal instruments in the battles of the *Caraca* Indians against the Conquerors (Oviedo y Baños 1982[1723]).

Other possible use of *botuto* shells and/or other marine molluscs was to produce lime. According to the Spanish chroniclers, the aborigines of the northern part of Venezuela (especially the *Cumanagoto*) used to burn marine shells to obtain lime, an important ingredient that was mixed with '*coca*' leaves and chewed (Alvarado 1945: 110-111; Fernández de Oviedo y Valdéz 1962[1535]: 161; López de Gómara 1979[1552]: 295).

Yet another use of these large shells may have been to collect rain water. In 1982, in Cayo Sal Island, I found about 100 adult *botuto* shells placed in an upside down position, one alongside the other and arranged in a rectangular area of 2 x 2.5 meters. This was not a prehistoric feature, but according old local fishermen (Felipe Salazar, Loy Gómez, personal communication 1983) it was used by the 19th century fishermen from Bonaire Island to collect rain water. This method is, in fact, highly effective. In an experimental test I performed, I found that between four and five shells can collect as much as one litre of water during a half an hour of heavy rain. In 1986 larger scatters of up side down shells were located in the area of a 19th century lime-burning kiln on the Isla del Faro, Archipelago Las Aves de Barlovento (Antczak and Antczak 1988a). This ingenious way of obtaining potable water might have been used by the Amerindian visitors to the islands; however no direct evidence of such a practice was found in ethnohistoric or archaeological contexts. The patches of horizontally patterned *botuto* shell arrangements may have also been used in preservation of marine animal flesh. The meat could be extended over the shells to sun dry, protected from the sand. Some modern arrangements of this type I observed behind fishermen's huts on La Tortuga Island, in 1990.

What evidence of possibly non-functional use of the *botuto* shells may be inferred from the archaeological record of DM and other Valencioid insular sites?

The first example refers to the already discussed shells/hearths spatial associations where the shells were interpreted as hearth bases (Table 16). However, not all of these features had just a functional role. In the northern border of Trench C a group of five adult, unperforated *botuto* shells lay in a circle, at a depth of 47 cm (DM/C/FT/D; Figure 30). They were placed with the apexes pointing outside the circle and their dorsal parts were broken. A thin deposit of compact ash with small fragments of shell incorporated in it was concentrated in the centre of this shell circle, indicating that a small hearth lay immediately over the shells. The shells were thermally-altered but not charred or fragile. No remains except the *botuto* shells, two small fragments of coral stones, four fish vertebrae and spines were found in the immediate surroundings of this feature (ca. 0.5 m around it). This may indicate that the place was 'clean' or, what seems more probable given the overall structure of the site, that it had been carefully cleaned before the arrangement of shells and hearth was set up. Could the shells from this context have been used as a simple hearth base? It cannot be determined whether the dorsal parts of these shells were broken off to extract the flesh and consume it, or whether the flesh was not consumed but was left exposed in the damaged shells. Then the shells were arranged into a circle and a small hearth had been lit on top of them. Could this flesh/shell/hearth contextual association be interpreted as a result of an ritual activity in which the *botuto* molluscs played a prominent, although unknown, role?

In the second example, I briefly examine the possible meaning hidden behind the contextual associations between the *botuto* shells and the human burial recovered in Trench C. An incomplete human skeleton of an approximately 35±5 years old man of short stature but strong build was found at a depth between 27 and 16.5 cm (Berrizbeitía et al. 1991). Both perforated and unperforated *botuto* shells surrounded the human bones and were also just below them. These shell scatters lacked any recognisable spatial patterning and were evenly distributed like all other shells in Trench C. This suggests that the body was put directly on the shell scatter; in fact several bones were found lying directly on the shells. The possible burial offerings include one dismembered human ceramic figurine, a large pendant of serpentinite, a large quartz pebble and a small ceramic receptacle which contained a white powder, possibly lime obtained from burned shell. A number of decorated vessels and figurines were located to the east of the bones but not in immediate proximity. Several questions may be raised. Could the disposal of the deceased in Trench C, which was the main area in the site where the multiple activities linked to *botuto* mollusc processing were carried out, be the objectivisation of the functional and/or symbolic linkage between the dead and the shell-related activities? Was the possible participation during life in activities related to *botuto* procurement 'emphasised' by burying the corpse surrounded by shells that might have been considered as a metaphorically immense grave offering? (see also Marlena Antczak PhD thesis, forthcoming).

Finally, I will interpret the anomalies in the composition and spatial distribution of the *botuto* shell assemblage from Trench B. It is worth emphasising that this assemblage contained the major proportion of adult and old and unperforated *botuto* shells within the DM site (Table 12). Could these shells be considered as food debris even if they were unperforated and not affected by the fire? I consider that, as in other trenches where dozens of unperforated shells were found, the flesh from these shells might have been extracted by just pulling the animal from the shell or by some other method that does not leave any visible traces. It is however possible that the shells from Trench B were the remains of food that was extracted from selected molluscs, and by methods that leave the shell intact, because it was consumed by the 'special' people and/or for 'special' occasions. However, it is impossible to determine whether the flesh was extracted from these intact shells at all. Were they being prepared to be transported to the mainland as whole specimens? Why they were not participating in the shell manufacture observed in the Trench C? Some adult shells suitable for trumpet-making might have been chosen from among them. Among the *Caraca* Indians, who were the only possible historically known cultural heirs of the Valencioid people, shell trumpets were connected symbolically to man, warrior and battle (see Oviedo y Baños 1982[1723]). Were these shells selected by the warriors themselves or for the warriors? Can we think about the participation of these whole shells in any *in situ* rituals? Given that these shells were not purposefully grouped, as might have been expected in case of being prepared for the transportation toward the mainland, but were scattered toward the southern area of the trench, I suggest that they are debris of food consumed in ritual activities and/or by the prominent members of the society.

I further argue that the exploitation of *botuto* molluscs might have been accompanied by intensive ritual activities. The male of this gastropod, unlike other molluscs, displays a very prominent and 'humanlike' sexual organ that would not have gone unnoticed by the Amerindians. In this respect the *botuto* was the most 'humanlike' of all molluscs. Thus, while the non 'anthropomorphic' molluscs were simply collected and eaten whole, the thousands of *botuto* molluscs (because of their much larger size) had to be 'butchered' before consumption. In terms of its physical configuration (the penis), its overall size, and butchering treatment, *Strombus gigas* is conceptually closer to a mammal than to other molluscs, and prehispanic Amerindians may have made this connection. The shift in meaning attached to the exploitation of this particular mollusc probably demanded for rituals directed toward the protector spirits of this animal. It may be expected that this ritual intensity could dramatically increase while the original mollusc collection for self-subsistence might have changed toward the huge production for trade. The success of the mission carried out very far from the homeland, where human beings were especially vulnerable and exposed to the benevolence of the supernatural powers governing the marine environment, could in great measure depended on the ritual efficiency of the *botuto* shells. For this reason I argue that the *botuto* shells actively participated in ritual activities carried out in DM site.

Finally, I should emphasise that *botuto* flesh is considered as a powerful aphrodisiac by the people of Los Roques, and in general by all Venezuelan fishermen. This could be a result of its high protein content. However, in part it may also convey an old symbolic structure.

Non-*Strombus gigas* molluscs

The first part of this section begins with taxonomic identification and application of standard quantification measures. Publications by Abbott (1974) and Warmke and Abbott (1961) were used as standards for the taxonomic identification of the specimens. Having produced the taxonomic list (Appendix 2) I returned to the shells displayed on the laboratory tables. Instead of proceeding toward the interpretations of this molluscan assemblage I began the 'lecture' of the taphonomic, distributional and contextual information 'hidden' behind the taxonomic list. By doing so I attempted to determine which of these molluscs, in terms of taxa and quantity, were collected for food, for raw material, or for other purposes, and which might have pertained to the original sedimentary matrix of the site.

Goals, concepts, methods

For major clarity of discussion a few terms and concepts should be defined before I turn to outline the sequences and results of my analyses. Minimum Number of Individuals (MNI) counting was based, for gastropods, on the number of apexes or tips; for bivalves, on the number of valves with hinges divided by two (separation between right and left valves was not attempted); for chitons (Amphineurans), on the number of plates (valves) divided by eight. For taxa for which no whole shell, apex, or hinge were found, single fragments were counted as individuals, unless it could be determined that they were parts of the same individual. When only one shell specimen of a given taxon was found I considered it as one individual (MNI=1) regardless of whether it was a whole specimen or a fragment, with or without the MNI indicator. In Table 33, the Minimum Number of Shells (MNS), was introduced to account for the minimum number of all individual shells recovered in the DM site; it equals the MNI value of gastropod shells plus MNI of all single valves of bivalves.

The term 'mollusc' is reserved to describe both a biological taxon and a living animal, while a 'hard' mollusc residue recovered in archaeological site is a 'shell'. Those shells recovered in an archaeological site, whose margins and hinge teeth (for bivalves) and surfaces of inner lip and aperture (for gastropods) were worn by natural agents are designated as 'worn'. 'Worn' shells could have been (1) gathered 'empty', washed ashore, or (2) collected alive, with the animal inside, and then 'worn' as a result of post-depositional in-site processes, or (3) pertained to the original sedimentary context of the site. In contrast, 'unworn' or 'fresh' shells are those that do not show wear from water transport. These shells could have been purposefully collected alive and articulated (in the case of bivalves) in their natural habitats; however, an undetermined number might have been found on the beach, washed ashore, especially after storms. It may be expected that unworn shells are remains of molluscs collected principally, though not exclusively, for food. Considered as 'non-economic' species are those molluscs that are too small to provide a reasonable amount of flesh; this does not mean they are non-edible or poisonous. For instance, even though *Thais rustica* or *Nerita* can be eaten, despite their small size (height<2.7 cm), they can not significantly contribute to human diet, especially of larger human groups and/or for long periods of time. I am well aware of the fact that certain especially palatable or tasty species, as well as those to whose flesh might have been attributed special properties (i.e. aphrodisiac, medicinal), might have had great or even greater demand and value, despite their small size, than the large 'protein providers' (i.e. *Strombus* spp.). As 'modified' may be considered a large portion of the shell (neither whole nor fragments) whose structure was physically or chemically affected, regardless of whether it was due to biogenic or

TABLE 32. ***Taxonomic quantification of molluscan assemblage from DM site.***

Taxonomic category	Gastropods	Pelecypods	Amphineurans	Total
Class	-	-	1	1
Family	4	2	-	6
Genus	6	3	-	9
Species	42	33	-	75
Total	-	-	-	91

anthropogenic agents. In the majority of cases the effect of action of one or the other of these agencies is difficult to distinguish. Within this category are the so called 'ecofacts' and 'manuports', as well as, though not usually, manufacture debris. 'Worked' shells bear clearly identifiable evidences of action of human agency and the purposes of this actuation may be determined from the overall morphology of the artefact. This category includes the traditionally called shell artefacts (artefacts *sensu stricto*) whose function, and often also the meaning, may be inferred from the morphology and overall physical-chemical properties of the object. Finally, the 'catalogue numbers' that appear in the text refer to the Los Roques Scientific Foundation Archaeological Collection Catalogue Number.

The collection comprises three categories of specimens: manufactured shell artefacts, modified and unmodified shells. Almost all non-*Strombus gigas* molluscs from this collection, as well as from the rest of the insular sites, were identified by Roberto Cipriani (Committee on Evolutionary Biology, University of Chicago and Simón Bolivar University, Caracas). He also participated in off-site sampling and surveyed the waters around *Dos Mosquises Island* in order to study natural habitats and distribution of molluscan fauna. The present discussion is greatly enriched by his valuable comments and observations.

The sample

I should remind that, unless otherwise stated, the following discussion is focused on the non-*Strombus gigas* shells. Over 36% (N=1451) of gastropod shells, valves of bivalves and plates of chitons (MNS) were recovered from the layer 0-20 cm, and 63.3% (N=2511) from the layer 20-40 cm. Trench A, which is the shallowest at the DM site, contributed 46.9% (N=681) of all shells recovered in the level 0-20. Shells were unevenly distributed between trenches regarding both taxa and quantity. The richest in number of shells (excluding *botuto*) were Trenches C and B which yielded respectively 37.6% and 37% of all shells (MNS) recovered in DM. Trench B contained 91.1% of all identified taxa. The poorest in taxa and quantity were Trenches D, E and F. Low taxonomic diversity was found, as expected, in the *botuto* shell midden, which was cross-cut by Trench D (Table 33).

TABLE 33. ***Distribution of shells (MNS) and taxa between Trenches A-F in the DM site.***

Quantification measure	DM #	DM %	DM/B #	DM/B %	DM/C #	DM/C %	DM/D #	DM/D %	DM/E #	DM/E %	DM/F #	DM/F %	Total
Minimum Number of Shells (MNS)	782	19.7	1469	37.0	1493	37.6	61	1.5	64	1.6	93	2.3	3962
Number of taxa	59	74.6	72	91.1	53	67.0	10	12.6	16	20.2	10	12.6	79

Shells excavated at DM are, in general, well preserved. They are not chalky and fragile, unlike mainland specimens from the Valencia Basin sites. The preservation is so good that a few *botuto* specimens from Trench C even conserved fragments of their periostractum (thin noncalcareous covering [see Abbott 1974: 10; Bobrovsky 1984: 84]). Only these *botuto* shells that were exposed to the weathering on the surface, (see Dittert et al. 1980: 222), especially in the shell midden (Trench D), are chalky and have dark colour patches. Heat attrition on shell specimens, resulting from steaming or roasting, was not observed, except for the *botuto* shells used as hearth bases.

Manufactured shell objects

230 objects manufactured of marine shells, including the *botuto*, were found at DM. According to their possible use/function they may be grossly divided in three groups: (1) personal adornos, such as pendants, beads, discs and rings, (2) tools, including celts and awls, and (3) artefacts of undefined use/function and fragments (Table 34). Beads account for the majority of shell artefacts (N=127; 55.2%); 91 small, flat discoid beads, about 3 mm^2 in diameter dominated the bead assemblage. They have one conical, central perforation, and are made of whitish shell (probably the original colour). 15 medium size beads, whose overall morphology is similar to the small ones, are ca. 5 mm^2 in diameter. White shells were selected for the manufacture of small beads while orange/red shells, probably *Spondylus* and/or *Chama* spp. shells were preferred for making medium size beads. All small beads are finished, while 21 blanks or medium size preforms lack perforation, and their shaping is unfinished; some of them are broken, probably during the perforation process. The conspicuous presence of these preforms indicates that beads could have been manufactured *in situ*, particularly in the area of the Trench B, where 69% (N=25) of all medium size examples were found. However, the presence of the unfinished beads or blanks is not necessarily indicative of *in situ* shellwork activities. The presence of certain number of specialised tools, such as small lithic drills, may be expected in such a working area. These tools were not found in DM site. Serrand (1997: 217) noted that many blanks were found in burials in Dabajuroid site in Tanki Flip, in Aruba (see also Coomans 1987). She suggested that these blanks might have been considered as finished specimens with value and function which are unknown. In conclusion, whether a small workshop dedicated to bead-making functioned or not in DM site is, thus far, uncertain. Beads are followed in number by 71 *botuto* shell flat discs. These artefacts are of different sizes and appear in different

TABLE 34. ***Worked shell artefacts from Trenches A-F, DM site.***

Artefact category	Taxon	DM 0-20	DM 20-40	DM/B 0-20	DM/B 20-40	DM/C 0-20	DM/C 20-40	DM/E 0-20	DM/E 20-40	DM/F 0-20	DM/F 20-40	Tot.
Simple pendants	*Tivela mactroides*	1		1	9		3					14
'Star-like' pendants	*Strombus gigas*?				2							2
Carved bird pendant	*Strombus gigas*?				1							1
'Question mark-like' pendant	*Cittarium pica*				1							1
Rectangular pendant	?				1							1
Unfinished/damaged carved pendants:												
Triangular	*Strombus gigas*?				1							1
Anthropomorphic	*Strombus gigas*?				1							1
Small bead	*Strombus gigas*?	2		9	72		5		2	1		91
Medium size bead	*Spondylus* spp.	2		2	5		2		2			13
	Strombus gigas ?				2							2
Unfinished medium size bead	*Spondylus* spp.	1		3	12		3					19
	Strombus gigas?				1		1					2
Celt (?)	*Strombus gigas*				1							1
Disc	*Strombus gigas*	4	1	12	30	6	15	2			1	71
Ring (?)	*Strombus gigas*?				1							1
Awl (?)	*Strombus gigas*				1							1
Worked shell spine	*Strombus gigas*				2							2
Unidentified	*Strombus gigas*				5							5
Unfinished artefacts or fragment	*Oliva reticularis*				1							1
Total		9	2	27	149	6	29	2	4	1	1	230

Tot. = Total

stages of manufacture, ranging from polished and perforated to roughly shaped, by pecking. There are also non-perforated specimens (see Table 19).

Carved shell adornos are rare (Figures 46 and 87). The most interesting complete specimen is a tiny pendant representing a bird. One triangular pendant with carved geometric motifs is broken and another one, a possible human effigy, seems to be unfinished. Two necklace beads were carved in the form of 'stars'. One very small polished rectangular shell plaque, only 1 mm thick and 7 mm long, has two conical perforations; it could have served as a bead and/or as a necklace separator. Another small object is a pendant in the form of a question mark, with a biconical perforation at its base. This artefact was made out of *Cittarium pica* shell. A tiny shell ring, found in Trench B, might have been used as a pendant or as a finger ring. 16 *Tivela mactroides* valves have holes around the umbo obtained by grinding the shell surface against some abrasive material (Figure 44). 56% (N=9) of these came from Trench B, which yielded the largest concentration of these pendants of all the Venezuelan islands, except for the Saladoid assemblage from Los Cumaneces site, in La Tortuga Island.

Shell tools are uncommon artefacts in DM site. One possible celt made of the exterior lip of a *botuto* shell, with polished sides and abraded borders, may be interpreted as an axe/chisel preform or as unfinished pendant. Also from *botuto* shell were made two awl-like artefacts that might have been used for piercing soft material (Figure 87).

Artefacts of unidentified use/function include two nodes separated from the body whorl of *botuto* shell (Figure 87). Their bases were ground whilst the tips were left unmodified. Similar specimens were reported from Dabajuroid contexts from the Netherlands Antilles (Curaçao, Bonaire and Aruba), to the west from Los Roques Archipelago (Coomans 1987: 7), and La Blanquilla Island (Figure 87 c), to the east, from a post-Saladoid context (Antczak and Antczak 1991a). These artefacts can be interpreted as preforms for ear-plugs. They are also reminiscent of the three-pointed objects so widespread over the late prehistoric sites in the Caribbean (i.e. Clerc 1974:131; Serrand 1997: Fig.149). Three curved polished shell fragments might have been broken during the manufacture of nose-rings or earrings. One *Oliva reticularis* shell with grooves carved around the body whorl and missing its distal end represents, probably, manufacturing debris. Finally, one thick rectangular plaque with parallel lines grooved in one end and one rhomboidal artefact with polished parallel surfaces and edges might have been worked for pendants.

Worked shell artefacts specified in the Table 34 were distributed very unevenly between trenches: 76.5% (N=176) were concentrated in Trench B, followed by 15.2% (N=35) in Trench C and 4.7% (N=11%) in Trench A. Trenches E and F yielded, together, only 3.7% (N=8) of all artefacts.

In conclusion, manufactured shell specimens are rather low in number and diversity, at DM. Functionally they almost exclusively represent personal adornos, and were concentrated in Trench B, in a non-refuse area. Small scale shell work had been carried out in the site, especially in the area of Trench B. The *botuto* was by far the preferred raw material followed by *Spondylus* shells, mainly *Spondylus americanus*. Except for one *Tivela mactroides* pendant, no manufactured shell artefacts were deposited in the immediate proximity of the human burial in the Trench C.

'Reading' beyond the taxonomic list

There is no mechanistically-applied formula which permits functional interpretation of molluscs from different archaeological sites. The different taphonomic processes are site-specific; hence functional discriminatory analyses of unmodified shells are complex exercises (see Ceci 1984; Lundberg 1985a; Waselkov 1987; Spennemann 1993; Reinink 1997: 151). They involve all archaeological and environmental data, and, even so, these do not always lead to reliable conclusions. Diverse factors constrain the reliability or confidence one might have in identifying function/use for malacoarchaeological specimens. Some of the factors that affected the analyses of molluscan assemblage from DM site and other insular sites are briefly discussed here.

Both worn and unworn shells of the same taxon can be found within the same site, or even excavation unit. This is the case at the DM site. This differential preservation might be indicative of some kind of causal human agency, rather than being the result of differential action by natural agencies. However, this assumption must be verified by taphonomic analyses of other organic materials found within the same excavation units.

'Replicas' of naturally worn shells from archaeological contexts at DM may be found easily on Dos Mosquises Island beaches today, and, no doubt, they might have also been found there in late prehistoric times. Some shell 'tools' may be due to a mechanical biogenic rather than anthropogenic origin (see Lundberg 1985a; Spennemann 1993). Whole, unworn shells of recently dead molluscs can be found on these beaches after storms and periods of heavy seas. If some of these unworn shells of edible molluscs had been introduced into the site by the Amerindians, it is hard to distinguish them morphologically from the specimens that were collected purposively for food.

Some bivalves, Chamidae for instance, are so firmly attached to the solid substrate they live on, that they had to be separated with the use of a hammer or chisel by the Amerindian collector. This practice might have left recognisable traces on the attached valve, which is generally larger and more convex than the other one (Morris 1975: 50). In consequence, I suggest that certain shell modifications/marks left from exploitation/gathering processes can be confounded with those left from making shell artefacts. Pertinent experimental samplings and comparative analyses have not, however, been done.

In large gastropods, such as *botuto*, a highly distinctive punch-hole left in the spire is a tangible evidence of old Amerindian animal-extraction technique; however, a few other techniques can also be employed for the same purpose and these do not leave any visible traces on the shell. In consequence, how can we determine whether these intact shells were used for food or not? Techniques of meat extraction and preparation of molluscs for consumption vary from one mollusc species to another. The same human group might have also used different techniques for processing the same mollusc, depending on social, symbolic or environmental circumstances. Contemporary fishermen from Venezuelan Islands usually cook whole *Cittarium pica* and *Astraea* gastropods. Cooked shells, when discarded, are opaque; however, the cooked specimens are almost impossible to distinguish from the raw archaeological specimens (Waselkov 1987). Sometimes, the fishermen crush *Cittarium pica* shells completely, especially larger specimens, and cook the animal only, leaving heaps of broken shells outside the campsite. Use of one or another method is determined by availability of an appropriate cooking-pot and fireplace, among other factors. However, the fishermen may change methods spontaneously even if all other conditions are constant. Like *Cittarium pica* shells, many shells of edible molluscs are not suitable for further use, especially when crushed, cooked or roasted. The *botuto*, however, may be used for food and, further, its punctured shell still serves as a raw material.

In pelecypods, as with gastropods, the animal can be extracted from its shell before food processing, or the whole mollusc can be cooked or roasted. The techniques applied in animal

TABLE 35. ***Quantitative distribution (MNS) of worn and unworn shells of three edible mollusc species from the DM site.***

Taxon	Trench A; level 0-20 cm							Trench B; level 20-40 cm							Trench C; level 20-40 cm						
	WHOLE						FRAG	WHOLE						FRAG	WHOLE						FRAG
	Worn		Unworn		Modif.			Worn		Unworn		Modif.			Worn		Unworn		Modif.		
	#	%	#	%	#	%	#	#	%	#	%	#	%	#	#	%	#	%	#	%	#
Arca zebra	11	42	15	58	-	-	4	8	42	11	58	-	-	5	6	60	4	40	-	-	-
Astraea spp.	17	45	21	55	-	-	-	12	57	9	43	-	-	-	8	80	2	20	-	-	-
Chama spp.	57	93	4	6.5	-	-	50	32	82	7	18	10	26	30	35	73	13	27	4	8	80
Total	85	68	40	32	-	-	54	52	66	27	34	-	-	35	49	72	19	22	4	8	80

Whole-complete shells, N-eroded - not eroded shells, Modif.-modified, Frag. - fragment

removal do not, generally, physically damage the shell. However, charred shells accidentally put into the hearth are difficult to distinguish from those charred during food preparation process. In the DM site, both punched and whole *botuto* shells were often used as bases for the hearths.

Shells are not only affected by post-depositional processes, such as adverse physical-chemical properties of the soil matrix or the action of other non-biotic forces. Shells may have also been added, subtracted, or transferred back and forth from the site by non-human biotic agents. Animal bioturbation is largely diminished on these islands due to the absence of mammals and rodents. However, the shells of such gastropods as *Cittarium pica*, *Astraea* and juvenile *Strombus* are constantly moved, and in great numbers, back and forth from the site by hermit crabs (*Paguristes grayi* and *Petrochirus diogenes*). Insular campsites were also frequented by a considerable numbers of small lizards that are scavengers of human refuse. There is no doubt that both the hermit crabs and lizards actively participated in formation and transformation of insular archaeological sites and molluscan assemblages. Finally, certain natural modifications of shells, provoked by predators (Carricker 1969; Wodinski 1969; Luer 1986), are difficult to be distinguished from simple artificial modifications without microwear analyses and experimental replication (d'Errico et al. 1993; Taborin 1993). Given all these warnings, what reliable information, then, can be 'read behind' the list of molluscs recovered in the DM site?

Once the molluscs had been grouped according to taxa, units of excavation and MNI (Appendix 2), they were separated into edible and non-edible taxa (see Cervigón et al. 1992). In consequence, 148 valves of *Chama* spp. (largely *Chama macerophyla*), one of the most valuable edible bivalves, were included provisionally in the food debris category. My macroscopic analysis of these specimens revealed that 83.7% (N=124) of the valves' inner dorsal and ventral margins, as well as their hinges, were worn, just like the specimens washed ashore. These observations suggest that if valves of edible molluscs were, in fact, collected 'empty' from the beach for non culinary purposes, then MNI values (that count two valves as one individual) are invalid, when applied to the whole molluscan assemblage. Once the remains of shells collected 'empty' are distinguished from those of molluscs collected for food, then the MNI standard can be applied to the latter category and regains its informative value. To facilitate the quantification of shells that might have been collected for non-culinary purposes I introduced a figure of Minimum Number of Shells (MNS) which includes MNI of gastropods and the minimum number of valves, for bivalves (Table 33; Appendix 2).

In DM site, especially in Trench B, both worn and unworn *Chama* shells were often found at the same depths of excavation units, and in a horizontal distance of two or three centimetres from each other. Given this evidence, I assumed that the presence/absence of wear on *Chama* shells is not a result of the differential operation of diagenetic processes but of human behaviour. To determine whether or not these observations are taxon-specific, the shells of edible *Astraea* (largely *Astraea tecta* and *Astraea caelata*) and *Arca zebra* were also macroscopically examined; 68.3% (N=186) of them turned out to be worn specimens (Table 35). Other shells showed similar wear features: probably all *Cypraea* spp. shells, 6 of 12 *Strombus gallus*, 10 of 22 *Strombus costatus* and at least a half of the valves of *Codakia* and *Tellina.* All these specimens may have pertained to the sedimentary matrix of the site and/or may have been collected on the beach for non culinary purposes. The few unworn shells of economic species *Astraea* and *Cittarium pica* were too small (juvenile) to have been collected for food. More likely they were good candidates for temporary hermit crab 'houses'.

Did the worn shells pertain to the natural soil matrix of the DM site? If not, why and how were they introduced into the site? Can we assume that all unworn shells of edible species represent molluscs collected for culinary purposes?

In order to address this questions I adapted the 'check-list' of Bobrowsky (1984: 81), who enumerated reasons that account for the presence of gastropods in archaeological sites. Accordingly, molluscs recovered in the DM site may have been introduced to the site by humans (1) as food, (2) as raw material, (3) for unknown (incidental) purposes or (4) were introduced accidentally. They might have also been introduced to the site by (5) non human agents or (6) could pertain to natural sedimentary matrix. These reasons can be grouped into three sets: (1) 1-2-3, (2) 2-3-5-6 and (3) 2-3-4; the arguments included in each set are not exclusive.

Assuming that worn valves are not food debris, and knowing that unworn shells may represent food debris or freshly dead molluscs gathered on the beach for non culinary purposes, the next step is to determine whether or not worn shells would have pertained to the natural sedimentary matrix of the site. To examine this possibility five off-site test pits of 0.5 by 0.5 m were excavated in levels of 20 cm down to the depth of the water table (Figure 30; 1-5TP). Three pits (1,2, and 3TP) were excavated immediately to the east of the Trench D and two other (4 and 5TP) between Trenches A and B. The sand was screened through one square millimetre mesh.

TABLE 36. ***Mollusc taxa recovered during off-site sampling, DM site.***

Pit 1TP	#	Pit 2TP	#	Pit 3TP	#
0-20 cm		**0-20 cm**		**0-20 cm**	
Anadara cf. *notabilis*	2	*Brachidontes modiolus*	2	*Codakia orbicularis*	1
Barbatia dominguensis	1	Cardiidae	1	*Conus* sp.	1
Brachidontes modiolus	1	*Chama macerophyla*	1	*Nerita peloronta*	1
Cardiidae	1	*Cymatium pileare*	2	*Patelloida pustulata*	2
Cerithium literatum	1	*Macrocallista maculata*	1	*Tellina radiata*	1
Chama spp.	2	*Patelloida pustulata*	2	*Strombus gigas*	2
Chione cancellata	1	Subtotal	9	Subtotal	8
Codakia orbiculata	1				
Columbella mercatoria	1				
Crepidula fornicata	1				
Crucibulum auricula	1				
Diodora listeri	1				
Glycymeris pectinata	2				
Laevicardium laevigatum	1				
Leucozonia ocellata	3				
Olivella sp.	1				
Patelloida pustulata	1				
Pseudochama radians	1				
Strombus gigas	1				
Subtotal	24				
20-40 cm		**20-40 cm**		**20-40 cm**	
Acmaeidae	1	*Arcopsis adamsi*	1	*Codakia rbicularis*	1
Americardia media	1	*Chama macerophyla*	1	*Codakia orbiculata*	1
Arca imbricata	2	*Chione oancellata*	2	*Barbatia orbiculata*	2
Barbatia domingensis	1	*Codakia orbicularis*	2	*Chama* spp.	2
Cerithium literatum	2	*Codakia orbiculata*	2	*Tellina listeri*	1
Chama macerophyla	1	*Glycymeris pectinata*	1	Subtotal	7
Chione cancellata	2	*Glycymeris* spp.	2		
Columbella mercatoria	1	*Leucozonia ocellata*	1		
Crepidula fornicata	2	*Modiolus americanus*	3		
Crucibulum auricula	1	*Melampus coffeus*	1		
Engina turbinella	1	*Ventricolaria rigida*			
Glycymeris pectinata	2	Subtotal	17		
Glycymeris decussata.	1				
Haustellum mesosorius	1				
Leucozonia ocellata	1				
Pseudochama radians	1				
Strombus gigas	1				
Thais deltoidea	1				
Vermetidae	1				
Subtotal	24				

The test was carried out by Roberto Cipriani, Jorge Gutic (Central University of Caracas) and by the author.

Results of sampling indicate considerable differences in molluscan composition between natural and cultural deposits. Pits 1-3TP yielded 13 species and one family of molluscs that were not reported from the Trenches A-F. It was observed that these off-site deposits are dominated by non economic, small species of molluscs, and that, almost all shells of larger, edible molluscs are worn specimens. Pits 4 and 5TP, excavated between Trenches A and B, yielded samples of much lesser taxonomic diversity than pits 1-3. A few shells of *Fissurella nimbosa*, *Crepidula fornicata*, *Columbella mercatoria*, *Diodora* spp. and Vermetidae, were accompanied by 10 *Strombus gigas* shells and their fragments, eight *Chama*, two *Arca zebra* and *Codakia orbicularis*, one *Spondylus* *americanus*, *Oliva reticularis*, and heavily eroded *Astraea*. Almost all these specimens were worn. It is striking that these pits yielded several larger, economic molluscs than the former pits. However, these larger shells were found at a depth between 60-70 cm and the water table level, together with considerable quantity of small and medium size eroded corals. This sedimentary matrix lies below the lower limit of the cultural deposits of the nearby trenches and is separated from it by about 15-30 cm thick layer of sterile sand. Therefore, according to thus far gathered evidence the worn shells from the natural sedimentary matrix and the archaeological specimens are not intermingled.

Given the results of the off-site sampling, I assumed that the majority of whole, worn shells of the three economic species listed in Table 35 were introduced to the site by Amerindians, even though more intense off-site sampling is needed to reinforce my hypothesis. It is also noteworthy that *Engina turbinella*, *Arcopsis adamsi* and Vermetidae molluscs were not reported, thus far, for Los Roques Archipelago (see Rehder 1962; Work 1969). At this juncture I should add that Vermetidae shells were surely recovered from DM site. An unknown number of these shells were recovered through sieving and accidentally discarded, according to the information of one of our field assistants.

In the next step of my analyses I tested and refuted the possibility that Amerindian visitors might have introduced large, edible mollusc valves into the site accidentally. Roberto Cipriani suggested (personal communication 1994) that shells of such molluscs as *Crepidula fornicata*, small specimens of *Chama* and Vermetidae adhered originally to *botuto* shells and were introduced into the site with them. Larger bivalves live attached to large dead corals or beach rock and may be transported to the site, accidentally, together with their substrates only; however, only three relatively large corals were found in Trench B, one of them modified for use as a *metate*.

I observed that such non-human agents as superficial rain water creeks or streams, may displace archaeological artefacts off-site, in larger islands such as the Gran Roque, La Orchila or La Tortuga. In the flat and sandy Dos Mosquises Island, however, superficial streams are absent even during periods of heavy rains and, in consequence, they were not responsible for the displacement of valves between seashore and the site. There were also no signs of sea penetration into the interior of the island during the post-depositional times. Finally, it should be added that there are no autochthonous mammals or rodents that might have transferred the shells tri-dimensionally, and the hermit crabs are not 'interested' in valves. Large crabs that dig burrows in the soil are not reported from the small Los Roques cays (Sociedad 1956).

Were the worn shells of *Arca*, *Astraea* and *Chama* collected as a raw material for the *in situ* shellwork? The analysis of both finished and unfinished shell artefacts from DM site showed that only the medium size beads were made of *Spondylus* and/or *Chama* while all other artefacts were made of *botuto* and/or of other, unidentified whitish shell. Examining the shell assemblage I

TABLE 37. *Mollusc opercula from Trenches A-E, DM site.*

Taxon	DM/A		DM/B		DM/C		DM/D		DM/E		Total
	0-20	20-40	0-20	20-40	0-20	20-40	0-20	20-40	0-20	20-40	
Turbo canaliculatus	3	-	-	2	-	2	-	-	-	2	9
Natica canrena	2	-	-	-	-	-	-	-	-	1	3
Nerita peloronta	2	-	-	3	-	2	-	3	-	-	10
Lithopoma spp.	5	-	-	2	-	3	-	-	-	2	12
Total	12	-	-	7	-	7	-	3	-	4	33

observed that 16% (N=14) of worn and unworn *Chama* shells, from Trenches B and C, showed patterns of 'fresh' or unworn, probably artificial, fracture. All of these damaged valves lacked major or minor part of the posterior end. This patterned modification seems to strengthen the proposition that some worn and unworn *Chama* valves might have been used as raw material. My 'reading' could not finish at this juncture, since the following question arises: Even though certain worn *Chama* shells were used as raw material, can this explanation account for other worn edible mollusc valves recovered in the site? Maybe the unidentified whitish shell that served as raw material for some manufactured objects can be found among them? I found that 45% (N=25) of 55 *Arca zebra* (bivalve) and 53.6% (N=37) of 68 *Astraea* spp. (gastropod), both being shells of economic molluscs, were worn. Neither the worn nor the unworn shells of these species showed any kind of 'fresh fracture', similar to the *Chama* shells. These data suggest that some worn valves were introduced to the site neither for food nor for raw material. In addition I assume that no artefact was made out of these shells, and that the omnipresent *botuto* is the unidentified whitish raw material for artefacts.

To summarise, only <u>some</u> of the edible molluscs from the Appendix 2 may have been collected for culinary purposes. The rest of shells were gathered on the beach, already washed out by the sea, regardless of whether they were worn or not. These shells were picked up as curiosities, used as raw material for beads and/or pendants, or for unknown reasons, including, probably, certain religious/ritual purposes. It may be speculated that some of these reasons include ceremonial purposes. It is noteworthy that Meehan (1982: 71) observed that, among the Anbarra people in Arnhem Land (Australia), children collected a wider range of mollusc species than the adults and, sporadically, collected smaller, barely economic, individuals (see also Attenbrow 1992: 15). Might the wide range of sea-worn shells recovered from the DM site be indicative of the presence of children in the campsite? In addition a small percentage of these shells would pertain to the natural sedimentary matrix of the site.

Is the above, however, all that can be said about the dietary contribution of the edible molluscs listed in the Appendix 2? Was there no direct evidence to indicate that certain molluscs were used for food in the DM site? It may be argued that the use of certain gastropods for food can be proved by presence of their opercula in the site. 33 opercula pertaining to four taxa were recovered in DM; 22 (67%) of them were worn, similarly to the water-worn specimens from the beach (Table 37). It

TABLE 38. ***Availability of archaeological molluscs (living or dead) in natural habitats close to the Dos Mosquises Island, Los Roques Archipelago.***

DM site archaeological	DM Island L	DM Island D	Observations (1)	DM Island L	DM Island D	Los Roques L or D	Observations (2)
Aequipecten spp.	x	x	-	x?	-	-	*Aequipecten acanthodes*, one specimen found
Americardia media	x	x	Low densities	-	-	-	Not reported species
Amphineurans	x	x	Many species	-	-	x	Moderately common
Anadara notabilis	-	-	Not reported species	-	-	-	Not reported species
Anadara spp.	-	x	Hard to find alive	-	-	-	Not reported genera
Arca zebra	x	x	-	x	-	-	Uncommon
Arcopagia fausta	x	x	-	-	-	-	Not reported species
Asaphis deflorata	-	-	Not reported species	-	-	x	One dead specimen
Astraea spp.	x	x	Few species	x	-	-	*Astraea tecta*, moderately common
Bulla striata	x	x	-	-	-	x?	*Bulla umbilicata*, moderately common
Bursa corrugata	-	-	Not reported species	-	x	-	Fragments only
Cassis flammea	-	x	Hard to find alive	-	-	x	One dead and one living
Chama spp.	x	x	Few species seen	x?	-	-	*Chama macerophylla* uncommon
Charonia variegata	x	x	-	-	x	-	Fragments only
Chicoreus brevifrons	x	x	-	-		-	Not reported species
Chione paphia	x	x	-	-	x	-	Single valve
Chlamys imbricata	-	-	Not reported species	x	-	-	Single valve
Cittarium pica	x	x	-	x	-	-	Abundant
Codakia orbicularis	x	x	-		x		Single valve
Columbella spp.	x	x	Many species	x	-	-	*Columbella mercatoria* abundant
Conus spp.	x	x	Many species	x	-	-	*Conus mus*, rare
Crepidula fornicata	x	x	-	-	-	x?	*Crepidula convexa* (Say), reported by Rehder 1962
Cymatium pileare	x	x	-	x	-	-	Uncommon
Cyphoma gibbosum	x	x	-	x	-	-	Uncommon
Cypraea cinerea	x	x	-	x	-	-	Rare
Cypraea spurca acicularis	x	x	-	-	-	-	Not reported species
Cypraea zebra	x	x	-	-	-	-	Not reported species
Cypraecassis testiculus	x	x	-	-	-	x	One dead specimen
Dendrostrea frons	x	x	-	-	-	-	Not reported species
Diodora listeri	x	x	-	x?	-	-	*Diodora dysoni*, moderately common
Fasciolaria tulipa	x	x		-	x	-	Fragments.
Glycimeris decussata	-	x	All *Glycymeris* spp. are hard to find alive	-	x	-	One dead specimen
Glycymeris americana	-	x	-	-	-	-	Not reported species
Glycymeris pectinata	-	x	-	-	-	-	Not reported species
Glycymeris undata	-	x	-	-	-	-	Not reported species
Haustellum messorius	-	x	Hard to find alive	-	-	-	Not reported species
Laevicardium laevigatum	x	x	-	-	-	x	One dead specimen.
Latirus infundibulum	x	-	Very low densities	-	-	-	Not reported species
Leucozonia ocellata	x	x	-	-	-	x	Rare
Leucozonia nassa	x	x	-	x	-	-	Common
Lithopoma caelata	x	x	-	-	x	-	Fragments only
Lithopoma tecta	x	x	-	x	-	-	Moderately common
Lucina pectinata	-	x	Hard to find alive	-	-	-	Not reported species
Lyropecten nodosus	-	x	Hard to find alive	-	-	-	Not reported species
Macrocallista maculata	x	x	-	-	-	x	Rehder 1962
Marginella prunum	-	-	Not reported species	-	-	-	Not reported species
Marginellidae	x	x	Many species seen	-	-	-	Not reported species
Melongena melongena	-	-	Never seen alive in DM	-	-	x	One living and one dead.
Modiolus americanus	x	-	Moderately common	x	-	-	Rare
Murex macgintyi	-	-	Not reported species	x?	-	x	*Murex pomum*, rare *Murex brevifrons* reported by Rehder 1962
Natica canrena	-	-	Not reported species	-	-	-	Not reported species
Nerita peloronta	-	x	Hard to find alive	x	-	-	Moderately common
Nerita versicolor	x	x	-	-	-	x	Common
Oliva reticularis	x	x	-	x	-	-	Common
Olivella spp.	x	x	-	x?	-	-	*Olivella dealbata*, common

TABLE 38. (cont.)

DM site archaeological	DM Island L	DM Island D	Observations (1)	DM Island L	DM Island D	Los Roques L or D	Observations (2)
Pecten ziczac	-	x	Hard to find alive	-	-	-	Not reported species
Periglypta listeri	-	-	Not reported species		-	-	Not reported species
Phalium granulatum	-	-	Not reported species	-	x?	-	Phalium cicatricosum,
Pinctada imbricata	x	x	-	x	-	-	Rare
Pinna carnea	x	x	-	x	-	-	Rare
Pisania pusio	x	x	-	x	-	-	Common
Polinices lacteus	-	x	Hard to find alive	-	-	-	Not reported species
Pseudochama radians	-	x	Hard to find alive	-	-	-	Not reported species
Pteria colymbus	-	x	Hard to find alive	-	-	x	Living
Spondylus americanus	x	x	-	x?	-	-	*Spondylus ictericus*, uncommon
Strombus costatus	x	x	-	x	-	-	Moderately common
Strombus gallus	x	x	-	x	-	-	A single living specimen
Strombus gigas	x	x	-	x	-	-	Moderately common
Strombus pugilis	x	x	-	-	x	-	One dead specimen
Strombus raninus	x	x	-	-	x	-	A single fragment
Tellina listeri	-	x	Hard to find alive	-		-	*Tellina fausta*, uncommon
Tellina radiata	x	x	-	-	x	-	One dead specimen
Thais deltoidea	x	x	-	x	-	-	Common
Thais rustica	-	x	Hard to find alive	-	-	-	Not reported species
Tivela mactroides	-	-	Not reported species	-	-	-	Not reported species
Tonna maculosa	-	x	Hard to find alive	-	x	-	Two dead specimens
Trachycardium isocardia	x	x	-	-	-	-	Not reported species
Trachycardium magnum	-	-	Not reported species		-		Not reported species
Trachycardium nuricatum	x	x	Uncommon	-	-	-	Not reported species
Trachycardium spp.	x	x	Uncommon	-	-	-	Not reported genera
Turbo canaliculatus	-	-	Not reported species	-	-	-	Not reported species
Vasum capitellum	x	x	-	x	-	-	Common
Ventricolaria rigida	-	-	Not reported species	-	-	-	Not reported species
Vermetidae	-	x	Hard to find alive	-	-	-	Not reported family
Voluta musica	x	x	-	x	x	-	Uncommon

Sources: Columns 2-4 - 'DM Island (L, D)' and 'Observations (1)': R. Cipriani, unpublished research; Columns 5-8 - 'DM Island (L, D)', 'Los Roques (L,D)' and 'Observations (2)': Work 1969, wherever other author is not cited. Symbols: L - living mollusc; D - dead specimen; x? species not reported but other member of this genus was found.

would be expected that unworn opercula may have pertained to the shells that were 'opened' for animal extraction at the site, rather than to those gathered at the seashore with the dead animal inside. Two unworn calcareous opercula of *Natica canrena* found in Trench A may represent molluscs collected for food; however they may also have been picked up on the beach due to the attractiveness of their natural design. These opercula lose their attractiveness in worn specimens (see Morris 1975: Plate 47-13). It should be added that not all opercula have the same chance of survival in archaeological sites due to their different physical-chemical properties. Opercula of such valuable edible species as *Strombus gigas* are horny and that of *Cittarium pica* is thin and leathery; both have lower probability to survival in archaeological record than the thick, calcareous opercula of *Turbo* and *Astraea* (Morris 1975; Abbott 1974). Only thick calcareous opercula survived in DM. Given that not a single operculum of the dominant *Strombus gigas* species was recovered in this site, it can be suggested that taphonomic processes 'erased' all leathery and horny specimens from the archaeological record.

One semiprecious pearl of *botuto* survived in the Trench B; this might have been found by Amerindians during in-site processing of the meat or during the extraction of the animal on the beach and, later, brought to the site.

It can still be argued that the comparative analyses of the molluscs recovered from the archaeological site and those that naturally inhabit the site-surroundings may shed light on human selectivity in mollusc-gathering practices and, in consequence, on dietary questions. The next step is to investigate whether the archaeological molluscs reflect dietary habits, other culturally induced selectivity, or their availability in the site surroundings. The ecological data on the present-day molluscan population in the vicinity of DM was collected in two further studies. Between 1982 and 1985 hundreds of shells washed ashore on Dos Mosquises Island. They were collected by Roberto Cipriani and the author. Additionally, Cipriani examined all types of microenvironments around Dos Mosquises Island, from intertidal zone to a depth of 20 m, in search of living and dead molluscs. All recovered/observed taxa were registered and compared with taxonomic list of archaeological specimens. The results of this research together with the list of Los Roques Archipelago molluscs published by Rehder (1962) and Work (1969) give a solid ground for taxonomic comparisons between archaeological and modern molluscs assemblages. Work (1969) collected specimens in 17 localities; however, only the localities around DM will be discussed here (Localities 1, 2, 6, 7, 16, 17; Work 1969, Fig.1).

All dominant species (according to MNS values in descending order) such as Amphineurans, *Codakia, Cittarium, Chama, Oliva, Columbella, Lithopoma, Arcopagia* and *Cypraea* were found alive and/or dead in the area of Dos Mosquises Island (Table 38). *Cittarium pica, Oliva, Lithopoma, Chama* and *Columbella* were reported by both researchers Cipriani and Work and *Arcopagia fausta, Codakia orbicularis, Cypraea* and Amphineurans were observed only by Cipriani. Especially intriguing is the fact that Amphineurans and *Codakia orbicularis*, which dominate the archaeological assemblage, were reported by one researcher only. The surroundings of the island provide favourable habitats for all named dominant species. Seasonal and/or other undetermined environmental changes within the archipelago may account for this drastic change in mollusc availability reported for a period of approximately 15 years. However, this dichotomy may also be, in part, a result of different sampling strategies adopted by these marine biologists. Cipriani suggested (personal communication 1997) that the absence of Amphineurans in other reports may be explained by the fact that these molluscs live adhered to firm substrates, in intertidal and subtidal zones. In consequence, they are well camouflaged there and maybe easily overlooked when not searched purposefully.

Eight species that were found in DM site were not reported from modern samplings (Cipriani, Work and Rehder) in all Los Roques Archipelago: *Anadara notabilis, Marginella prunum,* *Trachycardium magnum*, *Turbo canaliculatus*, *Natica canrena*, *Periglypta listeri*, *Ventricolaria rigida* and *Tivela mactroides*. I have not enough space to discuss here the ecology and environmental requirements of each of these species. I should emphasise only that it is highly probable that all these taxa, except for *Tivela mactroides*, may be observed during future samplings since the archipelago does provide habitats suitable to sustain them. *Tivela mactroides*, however, which is represented by 37 specimens in the archaeological collection, was, almost surely, collected by the prehistoric people outside the Los Roques Archipelago. The preferred *Tivela* spp. habitats, characterised by high levels of organic matter and resuspension of fine sediments, on the continental sandy coasts, have not, thus far, been located in the Los Roques Archipelago (R. Cipriani, personal communication 1997).

Two species, *Melongena melongena* and *Asaphis deflorata*, were not reported either by Cipriani or by Work, from Dos Mosquises Island surroundings. Two small piles of whole *Melongena melongena* shells were recovered in the Trench C, at DM: one contained 7 and the other, at a distance of 1.2 m, contained 12 unworn shells. These piles yielded 65.5% (N=19) of all molluscs of this species recovered in DM site. These molluscs were probably gathered for food somewhere toward the northern shore of Cayo Sal Island (information obtained from local fishermen Pablo Mata in 1992) or about five km to the east of Dos Mosquises Island, in the western part of Isla Larga (Work 1969: 636). *Asaphis* might have been brought from the very close La Pelona Island (Work 1969: 700); this species was represented by three valves only in the archaeological sample.

Only one living *Cassis madagascariensis* was observed in Dos Mosquises Island waters (R. Cipriani, personal communication 1997), while a few eroded fragments of *Cassis* shells were found on the beach (Work 1969). They are absent from the archaeological assemblage except for 3 individuals (MNI) of *Cassis flammea* in the Trench DM/B. Absence of such a large gastropod as *Cassis* in the archaeological record was, for me, a surprise, since their shells are traditionally highly valued for cutting cameos. The *Cassis madagascariensis* shell in particular yields a distinctive cameo with a reddish-orange or pink background (Morris 1975: 179). These molluscs can be easily found, though not in abundance, in shallow waters to the west of Isla Larga Island (information obtained from local fishermen Pablo Mata in 1992). Despite their very distinctive colours and shape they were, surprisingly, of little use to Amerindian shell workers, not only in Los Roques islands but all over the small Venezuelan islands. To the present-day traditional fishermen from Los Roques Archipelago these shells resemble a human skull. They call them 'skulls' (*calaveras*) and use them for food rarely (information obtained from local fishermen Felipe Salazar, Teobaldo Salazar between 1983-85). The last data is, however, ambiguous, since Roberto Cipriani (personal communication 1997) reported that fishermen from the Isla Fernando, Los Roques Archipelago, were occasionally using *Cassis* for food. To English speakers these shells resemble a 'helmet' as reflected in the vernacular names King Helmet, Clench's Helmet and Flame Helmet given to *Cassis* shells. Could these modern associations have been interpreted as an echo of an Amerindian taboo imposed on large representatives of genus *Cassis* due to the resemblance to a human skull? May this be responsible for their absence in the DM site? For now, I prefer to formulate two mutually exclusive explanations: the occupants of DM either (1) highly valued *Cassis* shells, so they took all obtained specimens to the mainland or, (2) due to opportunistic collection of empty shells on the nearest beaches, they did not gather any whole specimens of this taxa, just as it happened during the modern sampling.

Comparative analyses between archaeological taxa and their modern distribution in Los Roques Archipelago brought uncertainty regarding the efficiency of this method for constructing inferences about Amerindian selectivity and edible mollusc exploitation patterns. The data seem to indicate that seasonal and/or other environmental changes may affect distribution of molluscs in very small areas within the archipelago, in relatively short periods of time. However, the refutation or confirmation of this hypothetical explanation of ambivalent results yielded by modern sampling is not a 'work' for an archaeologist. One of the most important legacy of modern samplings for archaeological study of DM site is Work's (1969: 626) statement that 'the least productive of any single sampling of this locality [Locality 1, toward the south-west corner of the Dos Mosquises Island] yielded a richer molluscan fauna than that of any other area [in all the Los Roques Archipelago] in which collecting was done'. Cipriani's research of Los Roques Archipelago malacofauna confirm Work's statement (R. Cipriani, personal communication 1997). These data indicate that Amerindian campsites on Dos Mosquises Island were located close to one of the richest mollusc beds in all the archipelago.

Continuing the search for the information 'hidden' behind the Taxonomic List, my attention was drawn to *Codakia* shells. This is an edible mollusc of which 418 worn and unworn valves were found in the DM site. Only 13% of these valves were complete. 87% (N=363) of those had broken or retouched bases (margins opposite to the umbo or beak). In some specimens only a tiny fragment of the margin is missing while others lacked half or more of the valve. 28 valves had 'fresh', sharply retouched margins. Several others showed use-wear on the ventral margins that may be a result of such human activities as cutting or scraping. These possible use-wear striations are, however, difficult to distinguish from those of naturally worn shells. A high percent of the *Codakia* shells be found directly on the beach have margins broken and worn in a very similar way to the archaeological specimens. The damage of the ventral margins may also be viewed as a result of shell-opening technique; however, it was observed not only on unworn shells (possible food remains), but also on worn specimens.

After macroscopic and microscopic examination of possible oyster shell knives from the Koobi Fora area (early Stone Age), Toth and Woods (1989: 253) concluded that the identification of such implements may be difficult since such taphonomic forces as high-energy beach waves or trampling could produce similar types of edge modification, without human participation. Additionally the striations left on bone by these utensils may be indistinguishable from cut-marks made by stone knives. The Dos Mosquises site yielded an interesting clue to shed light on these discriminatory problems. The one square millimetre sieving in Trenches A, B and C I yielded a total of 109 tiny, elongated, shell flakes which were separated from ventral margins of *Codakia* shells; 75 (68%) of them were found in Trench B. This evidence indicates that margins of certain number of valves were undoubtedly broken off, intentionally or unintentionally (trampling). Whatever human activity was responsible for this patterned breakage, it was localised in Trench B, and analyses of contextual associations of *Codakia* shells and their fragments may shed light on the origin of this damage. *Codakia* shell in its natural form can be used for scraping, and its edges, when retouched by a lithic or shell percussor, become sharp jagged and can effectively be used in animal butchery (see Toth and Woods 1989). Several authors hypothesised about the use of *Codakia* valves as cutters/scrapers in the Caribbean prehistoric sites (Brokke n.d.: 77; Serrand 1997: 209). In consequence, it might be expected that some of the Dos Mosquises specimens were used as scrapers and/or cutters, in processing marine resources.

I found it relatively easy to scale and butcher 12 medium and large size groupers (*Haemulon*) with one *Codakia* valve with a sharp edge, picked up on the Dos Mosquises Island beach, in 1992. During this experiment, that lasted for about half an hour, I twice re-sharpened the margin of the valve by striking it against a *botuto* shell. The valve might have still been used for cleaning several other fishes after that work was concluded.

Bivalves were reported to be used as fish scrapers in Barbados (Boomert 1987) and as manioc scrapers in the Xingú area of Brazil (Hartmann 1986 in Brooke 1995: 77). The inventory of lithic artefacts from DM site is very poor in utensils that might been used as butchery knives (Tables 70 and 71). This evidence may strengthen the hypothesis that *Codakia* valves were used for marine animal carcass processing. The shells of those *Codakia* individuals that were collected for food might, furthermore, been used as scrapers or cutters, making impossible the recognition of their previous use. I conclude that *Codakia* shells probably have entered the DM site for four different reasons: some (1) were collected opportunistically for culinary purposes. Others, (2) gathered on the beach to be used as scrapers and/or cutters; still other were picked up as (3) curiosities or, perhaps, for some unknown (4) ceremonial/symbolic purposes. The contextual associations of *Codakia* remains with other food debris should be analysed in search for the understanding of their functional meaning.

Attention should also be paid to *Cypraea* shells. 62 of them were found in Trenches A-C in the DM site; however, only 24 (38%) were complete. The dorsal part of the remaining 38 (62%) shells was removed, showing the early whorls (compare to Morris 1975, Plate 48: 17). The edges of about 25% (N=15) of these modified shells are sharp, the rest are waterworn; a few of them may be considered as intentionally smoothed or abraded by use. I assumed that some of these modified shells are of anthropogenic origin while others are the result of the action of biogenic agents. I agree with Brokke (1995: 76-77) that the modified specimens with identifiable use-wear can be considered as scrapers; however, such use wear traces were not observed on the specimens from DM site. The ethnographic data from Oceania give examples of the use of modified *Cypraea* shells as breadfruit peelers, octopus lures, bait containers, tools to smooth unfinished pottery, net sinkers and line weights (Spennemann 1993). I suppose that some of DM site specimens might have been used similarly as their counterparts from Oceania; however, direct data to asses this assumption is, thus far, unavailable from Los Roques prehistoric sites. Net sinkers and line weights made of *Cypraea* show the pattern of the fragmentation of the dorsal part of the shell typical for DM site specimens. This pattern is considered, at the same time, as a typical result of food extraction procedures (Spennemann 1993). This may indicate that some *Cypraea* molluscs were eaten, and the shells, later on, used as tools, in Dos Mosquises site. However, the presence of heavily waterworn specimens with dorsal parts modified by predators or other biogenic causes, indicate that some natural 'tools' were collected on the beach in Prehispanic times.

The *Oliva* shells have been regarded as highly valuable raw material for manufacture of pendants (tinklers) throughout the Amerindian Caribbean (i.e. Robinson 1978; Sutty 1978; Moholy-Nagy 1985; Coomans 1987; Serrand 1997). However, not a single DM site specimen shows a V-shaped incision at the anterior end, as the typical Caribbean tinklers. 28 (24%) of 116 *Oliva* shells have removed spires, which suggests that these shells may be considered as naturally 'pre-worked' shells (Sutty 1978). The borders of the fractures are waterworn and inner parts of columella are removed to facilitate stringing (see Bennyhoff and Hughes 1987: 120-121). I suppose that all these modifications were made by the natural predators and these shells were found on the beach, washed ashore. Presently, exact 'copies' of these shells can be easily found on the northern beaches of Dos Mosquises Island. It can not be inferred from archaeological record if 'fresh' shells only were used as a raw material for pendant elaboration or worn and naturally damaged specimens might have also been collected for this purpose.

Only three of 47 *Conus* shells from DM have a single perforation in their spires, suggesting, that they might have been used as pendants. However, the location, form and worn edges of these perforations suggest that they are, almost surely, not artificial but, instead, are the result of the action of marine boring organisms (see Carricker 1969; Wodinski 1969). In addition, the inner columella part of these shells was not eliminated, which would impede the proper introduction of an eventual suspension cord.

Finally, a few comments about chitons. In Los Roques Archipelago these edible molluscs live attached to beach rock and corals of the intertidal zone. To separate chitons from the substrate they are fixed to requires use of a piece of strong wood, whole *Strombus gigas* shell, or shafted or unshafted shell fragments or lithic flakes (i.e. a chisel-like instrument). The species of chitons recovered at DM were not identified; therefore their MNI value was approximately estimated. If all 137 chitons (Appendix 2) were used for food, as seems to be suggested by the unworn surfaces of the recovered plates, they could have contributed as much or more to the diet than some other valuable edible molluscs. Chitons might have been steamed, roasted or consumed raw. Only three fragments of plates were charred, indicating that roasting in the fireplace was not a common culinary practice in the DM site.

Contextual considerations

Modified and unmodified shells were unevenly distributed between the depositional and excavation units within the DM site. Two outstanding figures of this distribution should be emphasised.

Trench B leads the lists of molluscan statistics: it yielded higher taxonomic diversity and the largest number of worked shell artefacts. I could identify two main shell-related activities: mollusc processing for food and, possibly, consumption, as well as the manufacture of beads and pendants, that were carried out in the area of this trench. The activities that were responsible for the presence of those shells that had not been brought to the site as food nor as a raw material, remain undetermined. However, they might have also been linked to the possible ritual use of adult and old, unperforated *botuto* shells, recovered in this trench.

My second comment refers to the Trench C, specifically to its human burial context. No non-*Strombus gigas* shell artefacts, except for one *Tivela mactroides* pendant, were associated with this burial. This evidence represents an inversion of the mainland data, where marine molluscs were usually found in Valencioid funerary contexts. However, as already discussed, the Dos Mosquises corpse was buried surrounded by dozens of *botuto* shells that could, perhaps, be considered as an offering. On the other hand, he was buried with few outstanding lithic offerings, such as the larger serpentinite pendant and one whole quartz pebble, which is the largest found in all insular Valencioid sites. On Dos Mosquises Island, far from the lithic quarries located in the mainland, these stone artefacts might have had similar or even more 'exotic' value, than marine molluscs in Valencia Lake Basin sites.

My interpretations beyond the taxonomic list are far from conclusive. The amounts of non-*Strombus gigas* molluscs used for food by DM site occupants were not provided. Even so, I demonstrated that a taxonomic list of archaeological molluscs is of little or no value for the study of palaeoeconomy and palaeodiet unless it is accompanied by detailed description and discussion of the material conditions of the specimens that reveal taphonomic processes as well as by the detailed analyses of their spatial distribution.

To achieve better resolution of molluscan contribution to the diet of insular visitors, as well as of their functional and symbolic meaning the weakest aspects of my analysis can be strengthened by (1) extensive comparative microwear analyses of archaeological specimens, shells collected on the beach and these that pertained to the natural soil matrix, (2) comparative analyses of experimentally replicated artificially and naturally modified shells, and (3) thorough off-site molluscan sampling and comparative analyses of the obtained specimens with in-site molluscan assemblage. My analyses open the collection of non-*Strombus gigas* molluscs from the DM site for further research, re-definitions and re-calculations. However, to complete the panorama of marine mollusc exploitation in the insular area and relate it to the mainland, the importance and role of *Strombus gigas* molluscs for the insular societies should previously be assessed.

Marine molluscs in insular Valencioid sites

In all Valencioid sites in Los Roques Archipelago and La Orchila Island, the *botuto* shells were found in horizontal scatters closely associated to hearths and other molluscs. These assemblages contained different proportions of perforated and unperforated, uniperforated and multiperforated shells, as well as the majority of modified shell types that have been distinguished in the DM site assemblages. The shell perforators were also present in all these sites. The same may be said of the majority of the Dabajuroid sites and the Ocumaroid site from Domusky Norte Island. These evidences indicate that the activities that were carried out in the multifunctional areas of these campsites had always been resulting in the breakage of certain number of *botuto* shells. This pattern is repeated from site to site regardless the fact that the evidence of shellwork in all these sites is very weak, except for the Ocumaroid in Domusky Norte and Dabajuroid in Isla Palmeras sites. Therefore, the breaking of the shells seems to be linked more to mollusc processing for culinary purposes than to the shellwork.

There are several qualitative and quantitative similarities and differences between the structure and composition of the *botuto* shell assemblages in DM, DMN and IP sites. In DM and IP sites the emphasis was placed on lips preforms procurement; however, the cultural deposit from IP site is significantly 'poorer' in all sorts of non-*Strombus gigas* remains than those from DM and DMN sites. It seems probable that the Dabajuroids who operated in this place separated spatially the residential from workshop campsites. The occupants of the DMN site were also interested in procurement of shell lips and discs; however, they were modifying the *botuto* shell in such a specific manner that hundreds of nodules or spines were left in the site. As much as 1828 nodules were recovered in small heaps within the four square meter pit (#14), at the depth between 16 and 37 cm below the surface. These nodules were rather purposefully separated from the shells and are not by-products from the manufacture of other objects. The evidence of bead or pendant shellwork is very weak in this site.

These data add interesting dimensions to the Amerindian *botuto* shell use in the central Venezuelan Islands in different temporal/spatial frameworks. The representatives of all three cultural traditions (Valencioid, Dabajuroid, Ocumaroid) were highly interested in the alimentary value of the *botuto* molluscs. They also used the shell of the mollusc as a raw material. Each tradition left on the islands the remains of at least one site where large scale activities oriented toward the procurement of shell preforms (mainly lips and discs) were carried out. These preforms were taken out of the islands into the permanent settlements. The so called 'pre-Valencioid' shell deposits in the DM site indicate that their creators were almost exclusively interested in *botuto* as a food resource. If they, however, were interested in shells then whole, unmodified shells were brought from the islands toward the continent.

Let us now discuss the non-*Strombus gigas* molluscs. The Valencioid site CS/D, on Cayo Sal Island, in Los Roques Archipelago, yielded 26 mollusc taxa (Table 39). This number accounts for 28.5% of the total number of taxa recovered in the DM. It should, however, be remembered, that the lesser richness and diversity of molluscs at CS/D, in comparison with the DM sample, is, undoubtedly, the outcome of different sample sizes and volumes of screened soil.

Comparative analyses show several affinities between molluscan assemblages from CS/D and DM. The *Strombus gigas* shells dominate both samples. In CS/D they account for 48% (N=75) of all recovered shells (MNS), excluding Amphineurans (Tables 39 and 40). Except for one bivalve (*Arca imbricata*) and two gastropods (*Cymatium nicobaricum* and *Cassis tuberosa*), all other taxa from site CS/D were also represented in the DM. Worked shells are represented at CS/D by three pendants made out of *Tivela mactroides* shells, two small-sized perforated beads, one 'button-like' bead with two perforations, one medium-sized bead made of *Spondylus* and eight, unfinished, medium-sized *Strombus gigas* discs (Table 19). One 'pearl' of *botuto* was found in CS/D, as was the case at the DM site. Eight (43%) *Codakia* valves were, probably, artificially damaged, and tiny shell fragments separated from their margins were recovered in the sieve, as was the case at DM site.

There are also certain differences between the CS/D and DM molluscan assemblages. The perforation of one of the *Tivela mactroides* pendants (N Cat. 1849) was obtained by sawing a

TABLE 39. *Mollusc remains from the CS/D site.*

Taxa	0-20	20-40	MNS	MNI
Amphineurans	39	37	76	9
Arca imbricata	1	-	1	1
Arca zebra	2	-	2	1
Arcopagia fausta	-	3	3	1
Bulla striata	1	-	1	1
Cassis flammea	-	1	1	1
Cassis tuberosa	3	-	3	3
Chama spp.	2	1	3	1
Charonia variegata	1	-	1	1
Chicoreus brevifrons	1	-	1	1
Cittarium pica	3	1	4	4
Codakia orbicularis	19	4	23	11
Conus spp.	1	-	1	1
Cymatium nicobaricum	-	1	1	1
Cypraea zebra	-	1	1	1
Lithopoma tecta	1	-	1	1
Melongena melongena	-	8	8	8
Oliva reticularis	1	2	3	3
Oliva spp.	2	-	2	2
Spondylus americanus	2	1	3	1
Strombus costatus	5	-	5	5
Strombus gigas	60	15	75	75
Tellina radiata	2	-	2	1
Tivela mactroides	-	7	7	3
Trachycardium magnum	2	-	2	1
Voluta musica	1	1	2	2
Total	149	83	232	140

horizontal groove near the umbo, instead of abrading this part of the shell. This is the only one specimen with this inefficient type of perforation (Francis 1982: 713), among all pendants recovered in insular Valencioid sites. Similarly-made pendants were found in a post-Saladoid site called Las Cuevas de La Cabecera in La Blanquilla Island (Antczak 1991a).

Unlike the DM assemblage, the great majority of edible molluscs from the CS/D site, excluding the *Strombus*, are represented by unworn shells. This may suggest that they were collected for culinary purposes. Given that the CS/D site is particularly well located for easy and abundant harvest of such edible molluscs as *Cittarium pica, Arca zebra, Chama, Nerita* and chitons, the following question arises: Can these unworn shells account for all the edible molluscs exploited by the inhabitants of CS/D? It may, certainly, be argued that some shells might have been discarded somewhere off the site.

Only 300 meters south of the CS/D site begins the coast of the island which, being the southern barrier of all Los Roques Archipelago, is exposed to highly energetic, open sea waves. In consequence, intertidal zones, as well as the proper coast are covered by large dead coral rubble and beach rock. These intertidal areas are typical natural habitats of large communities of edible rock dwelling molluscs, principally *Cittarium pica* (Castell 1987).

Contemporary fishermen usually visit these shores in search of edible molluscs, and especially *Cittarium pica* (information obtained from local fishermen Pablo II Mata, Teobaldo Salazar, Luis Marcano, Felipe Salazar between 1983-85). A cultural deposit from a mid 18th century Spanish site is located only 30 meters to the east of the CS/D site. It contained about 200 *Cittarium pica* shells, indicating that the occupants of that site, according, at least, to the optimal foraging models (see Waselkov 1987: 118-119), made efficient use of this intertidal resource (Antczak and Antczak 1986b). Why, then, were only four shells of *Cittarium pica* recovered from the CS/D site?

I suggest that (1) larger quantities of these molluscs were collected, processed and discarded off site or, (2) that more economic species, such as *botuto*, were definitely preferred for food by Amerindian collectors. The other edible molluscs were collected occasionally, i.e. incidentally, during wading or diving for *Strombus*. It should be emphasised that toward the north of the CS/D site and, close to the shore, there are large extensions of seagrass beds that sustain one of the richest colonies of *botuto* in all Los Roques Archipelago (Brownell 1977; Laughlin and Weil 1983). In consequence, large quantities of *botuto* might have been easily collected from the shallow waters close to the CS/D site. Even though I intuitively favour the second of the above hypotheses I also should mention, that in many contemporary campsites of fishermen, in Los Roques and other islands, I observed small heaps of crushed *Cittarium pica* shells discarded after the animal was removed. These heaps always lay beyond the immediate surroundings of the hut (*rancho*) or group of huts. Even when the molluscs were steamed entire, the shells were also discarded in the dump area, away from the habitation space.

I push still further the interpretation of the relatively low abundance of edible molluscs observed at CS/D despite its proximity to large living populations. Could this evidence favour the previously formulated supposition; namely, that the adjacent mega-midden of *botuto* shells (CS/E) might, at least in part, have been created by the occupants of the CS/D site? Any functional linkage between these two sites still remains to be demonstrated by direct archaeological evidence.

I also observed that on the southern shore of Cayo Sal, the open sea waves wash ashore large quantities of 'fresh'- looking shells. Due to the constant movement of the coral rubble in the intertidal zone, many of these shells acquire sharp, unworn fractures. These shells differ considerably from smoothly abraded shells washed out on the sandy beaches of Dos Mosquises Island. These data suggest that even some of the unworn valves of edible bivalves from CS/D might have been collected 'empty' on the beach. Minor 'fresh' fractures of these shells could be erroneously attributed to human in-site agency, especially trampling, on shells collected for food. This evidence may lower still further the quantity of molluscs collected for culinary purposes at CS/D. Finally, I return once more to my supposition that the inhabitants of the CS/D site were intensely engaged in *botuto* collecting, and that the other edible molluscs were collected only incidentally.

Remaining still within the Los Roques Archipelago, it should be mentioned that the site CS/C, the second Valencioid site in Cayo Sal island, is overwhelmingly dominated by *botuto* shells. This typical one-species-dominated midden was, undoubtedly, created during specialised processing of thousands of *Strombus* shells. However, this site has, thus far, only been surveyed and for this reason its concrete overall structure and function(s), as well as functional linkage to other Valencioid sites within the Archipelago, is unknown.

KR and CA/A, the two remaining Valencioid sites in Los Roques, yielded very low numbers of taxa and quantity of molluscs, including *Strombus.* The KR site is situated close to the second largest natural *Strombus gigas* bed in the Archipelago, located in waters around Rabusky, Isla de Loco, Isla Agustín, and Sparky islands (Antczak and Antczak 1991). Several shell middens characterised by very low quantity, or even absence, of remains other than *Strombus gigas* shells, were located in this area (IL/A, IL/B, RA/A). Given that the diversity of artefacts found in KR is by far the highest among all these sites, it may be suggested that it was a multifunctional campsite related to the surrounding specialised campsites where the *botuto* was processed. The CA/A site, which is the last of the Valencioid sites from Los Roques discussed here, yielded low abundance of molluscs, including *Strombus.* This figure may be explained by the low occupational density of this site, by its unknown function, and/or by small sample size.

Regarding worked shell artefacts, one *Tivela mactroides* pendant was recovered in KR, and two in CS/C sites. The morphological similarity of these artefacts (except for one from the CS/D site) that was observed in all Valencioid sites does not imply cultural homogeneity of human groups that produced them. *Tivela mactroides* pendants are widespread in the Caribbean among several late prehistoric sites of different cultural affiliations. To discover possible exchange networks between these cultures it is necessary to investigate whether or not the distribution of the natural habitats of the mollusc overlap the distribution of these pendants.

Outside Los Roques Islands, the molluscan assemblage of the OR/F Valencioid site, in La Orchila Island, contains only 10 taxa and is quantitatively dominated by *botuto* shells. It should be noted that an eight square millimetre mesh was used during the excavation of this site which, undoubtedly, resulted in the under-representation of certain small taxa (see Casteel 1972). However, recovery techniques alone are not responsible for the overall taxonomic impoverishment of this assemblage, in comparison to other previously discussed assemblages. I argue that human behaviour and/or the area-specific ecological factors were responsible for this impoverishment.

Chitons were strikingly more exploited in OR/F than in any other Valencioid site (Table 40). Worked shells are represented by one *Oliva reticularis*, whose apex was cut off and columella modified so as to permit vertical introduction of a suspension cord. One roughly made *Strombus gigas* unperforated disc and one medium size unperforated bead of *Spondylus* or *Chama* complete the category of worked shells. Two possible scrapers-cutters of *Codakia* shell were also found in this site.

TABLE 40. *Quantitative distribution of chiton plates in DM, CS/D and OR/F sites.*

Chiton remains frequency	DM NISP Whole	DM NISP Fragment	DM MNI	CS/D NISP Whole	CS/D NISP Fragment	CS/D MNI	OR/F NISP Whole	OR/F NISP Fragment	OR/F MNI	Total NISP Whole	Total NISP Fragment	Total MNI
Quantity	950	313	137	76	19	10	1017	195	139	2043	527	287*
Density*			2.5			2.7			20.5			

For MNI whole plates were divided by eight and fragments by 16
* All excavation units where 8 mm² mesh was used were taken into account

The OR/F molluscan assemblage does not differ greatly from Los Roques Archipelago Valencioid assemblages. *Strombus gigas* is a dominant species and chitons were a very heavily exploited species. The probable existence of small scale *in situ* shellwork and use of *Codakia* tools are some of the traits observed in other Valencioid assemblages. La Orchila Island offers far fewer habitats suitable for *Strombus gigas* populations to grow. However, the OR/F site is well located in relation to shallow waters and seagrass beds that occur in patches among the sandy keys north-west from the site. Along the slightly uplifted limestone shore, to the north and south of the site, quite large quantities of rock dwelling edible molluscs may be found. These are, nevertheless, not numerous in the OR/F site sample. In consequence I suggest that, as in other Valencioid sites, the occupants of OR/F site were so interested in the exploitation of *botuto* that other edible molluscs, easily accessible in the surroundings of the site, were almost ignored.

In conclusion, *Strombus gigas* was by far the most important edible mollusc and raw material source for Valencioid islanders. Chitons and *Cittarium pica* were two other species purposefully searched for food. Opportunistic collection of other edible molluscs, as well as gathering of washed ashore empty shells for various purposes, were also common practices among Valencioid islanders. Small scale shell-work was probably carried out on a few Valencioid campsites, and *Codakia orbiculata* scrapers-cutters were used in the processing of marine resources. Entire worn and unworn empty shells were found in all sites but were especially numerous at DM. Trench B in this site yielded the assemblage richest in number and functional diversity of modified and unmodified molluscs and in their taxonomic variability. This trench also contained the most anomalous (in terms of its composition) assemblage of *botuto* shells, interpreted as being possibly ritual character.

It is my overall impression that the quantity of molluscan food remains in some insular sites, particularly the *botuto* remains from the DM and CS/C Valencioid sites, does not reflect the amount of molluscs consumed *in situ*. This quantity seems to be, by far, larger than that might have been expected to satisfy the immediate needs of the local fishery. It should also be emphasised that thousands of *Strombus* shells are lying beyond the excavated areas of the majority of trenches and test pits. These shells are, almost surely, integral parts of the excavated assemblages. If, as I suspect, quantities of whole shells, shell preforms and dried mollusc meat were shipped away from the islands, then their destination was, probably, the continental coast. How can we detect the destinations of this material? The eventual storage, consumption or redistribution of dried mollusc meat in the coast cannot be inferred directly from the archaeological record. But the route of whole shells, preforms and worked shells can be tracked from the islands to the continental coast and, further, into the Valencia Basin. These may also provide some clues as to where the dried meat may have ended.

Marine molluscs in Valencioid mainland sites

The north-central coast

The sites with ceramic assemblages related to the Valencia style, excavated or surveyed on the Venezuelan coast, yielded molluscan data of limited interpretative value. This limitation stems from deficiencies in recovery techniques. Fine mesh screening was not used and contextual associations of molluscs were, generally, neglected. Molluscs from several sites are unidentified and all specimens recovered on the central coast come from unsystematic surface collections.

Polished axes or celts made out of the outer lip of *botuto* shell, bevelled on one extremity, are outstanding among manufactured shell tools recovered from coastal sites. Several of these artefacts were collected in the lower slopes of the Cordillera de la Costa mountains that fall down to the central coast (Oramas 1917; 1946: 49). Dupouy and Cruxent (1946:148) mentioned *Strombus* polished axes as well as 13 unidentified natural shells, from the El Topo Valencioid site (see also Cruxent and Rouse 1958: 180). One *Strombus* axe showing use-wear on its sharp edge was reported from Puerto Colombia bay, to the west of the central coast (Martín 1995: 217; Fig. 19). Another axe was reported from the Chupaquire Valencioid site, on the central eastern coast (Nieves 1980: 293: Fig. 6, c [Table 41]).

A group of artefacts composed by gorges, from Playa Chuao, and barbs of composite fishhooks, from Puerto Maya and Playa Chuao sites (Martín 1995: Lam. 27), form the only known specialised fishing kit, among all coastal Valencia-related sites. From Playa Chuao two 'knives' (*cuchillos*) made of *Strombus* spp. shell splinters were also reported (Martín 1995: 218 [Table 41]).

Worked shell personal adornos, especially carved pendants, are absent in coastal collections, while simple pendants, beads and discs are very rare. This certainly may be, in part, a result of recovery bias. Oramas (1940: 1-12) reported shell beads and discs from mountain slopes, southward the central coast. From the same area comes one polished elongated pendant made of *Strombus gigas* lip, perforated toward one end, which I examined in 1996 in the Regional Museum, in La Guaira. This artefact comes from a possibly Valencia style-related site on the central coast (Alexis Rojas, personal communication 1996). Some shell artefacts were also found in the Valley of

TABLE 41. ***Taxa of modified and unmodified marine molluscs recovered in Valencia-related sites in central, central-western and central-eastern Venezuelan coast.***

Taxa	A	B	C	D	E	F	G	H	I	J	Reference
Amphineurans	-	x	-	-	-	-	-	-	-	-	Alvarez and Casella 1983
Arca spp.	-	x	-	-	-	-	-	-	-	-	Martín 1995
Codakia orbicularis	-	x	-	-	-	-	-	-	-	-	Martín 1995
Conus spp.	x	-	-	-	-	-	-	-	-	-	?
Crassostrea rhizophorae	x	-	-	-	-	-	-	x?	-	-	Nieves 1980
Donax striatus	x	-	-	-	-	-	-	-	-	-	Nieves 1980
Fissurella spp.	-	x	-	-	-	-	-	-	-	-	Alvarez and Casella 1983
Lucina spp.	-	x	-	-	-	-	-	-	-	-	Martín 1995
Nerita spp.	-	x	-	-	-	-	-	-	-	-	Martín 1995
Oliva spp.	-	-	-	-	-	-	-	-	-	-	?
Plicopurpura patula	-	x	-	-	-	-	-	-	-	-	Alvarez and Casella 1983
Strombus gigas	-	-	x	-	-	-	-	-	-	-	Nieves 1980
Strombus gigas	-	x?	-	-	-	-	-	-	-	x	Dupouy and Cruxent 1946; Cruxent and Rouse 1958
Strombus gigas	-	-	-	-	-	-	x	-	-	-	Antczak A. personal observation 1996
Strombus gigas	-	-	-	-	-	x	-	-	x	-	Oramas 1917; 1940
Strombus gigas	-	-	-	x	x	-	-	-	-	-	Alvarez and Casella 1983; Morales 1984; Martín 1995
Strombus gigas	-	-	-	-	-	-	-	x	-	-	Oramas 1917; 1940; Dupouy and Cruxent 1946; Cruxent and Rouse 1958; Nieves 1980; Martín 1995
Strombus gigas	-	-	x	-	-	-	-	-	-	-	Martín 1995
Thais spp.	-	x	-	-	-	-	-	-	-	-	Alvarez and Casella 1983
Tivela mactroides	x	-	-	-	-	-	-	-	-	-	Nieves 1980

A - unmodified; B - modified or fragments; C - knife-like tool; D - gorge; E - fishhook barb; F - bead; G - pendant; H - celt/adze; I - disc; J - awl/perforator

Caracas, to the south of the central coast. Ernst (1873: 173) mentioned 30 beads in the form of teeth, made out of *botuto* shells, that were collected in an Amerindian cemetery in El Valle, in Caracas.

Different marine molluscs, including modified and unmodified *botuto* shells are reported from various sites on the central coast (Alexis Rojas, personal communication 1996); however, contextual associations of these remains and their cultural affiliations are largely unknown. Given that Paleoindians and Archaic people, as well as the bearers of at least three different ceramic traditions (Tocuyanoid, Ocumaroid, Valencioid), settled this region thorough the prehistoric times, it is highly speculative to attribute specific cultural affiliation to decontextualised shell remains without rigorous field research.

In the central-western coast, the excavations in Puerto Maya yielded such taxa as *Plicopurpura patula, Fissurella, Thais* and Amphineurans (Alvarez and Casella 1983; Martín 1995: 199). Other molluscs such as *Arca, Codakia, Lucina* and *Nerita* were identified in Cepe, a coastal bay surveyed by Martín (1995: 202). A prominent feature recovered in this site is a bowl (*escudilla*) that contained an unspecified number of *Codakia orbicularis, Arca* and *Nerita* shells, as well as remains of parrot fish (Scaridae [Martín 1995: 202]). In La Cesiva site, located in mountainous area about 400 masl and five kilometres from the seashore, shells of marine gastropods were, according to Martín (1995: 202), abundant and homogeneously distributed thorough all levels of the deposit. *Nerita* shells were especially numerous in this site. At the western margin of central-western coast, Peñalver (n. d. c) excavated in two possibly Valencia-style related sites, one in San Gean, on the mountain slopes that fall down to the south-east of Puerto Cabello, and in Cumboto, on the beach close to Puerto Cabello. The presence of five features composed by large quantities of marine and landshells, animal remains, human direct and in urn burials, as well as pottery, animal bones and bone artefacts, in the Cumboto site (Peñalver n. d. c: 18) indicates that the inhabitants were exploiting marine molluscs quite heavily. The Cumboto site also yielded quantities of marine mollusc and shell artefacts associated with direct burials, in urn burials and pottery. Unfortunately, the molluscs from both sites are unidentified.

On the western frontier of the Valencioid Sphere of Interaction, the Cementerio de Tucacas site was reported as a small shell midden Cruxent and Rouse 1958: 148). Two bevelled shell artefacts were recovered in this site but neither they nor the rest of the shells that composed the midden were identified. Peñalver (n.d.c) excavated several shell middens situated near Tucacas. Their location overlaps with the Cerro Iguana site, an Archaic shell midden excavated by Cruxent (Rouse and Cruxent 1963: 39, 47). Peñalver suggested that large quantities of shells were used by the ceramic people to protect their burials from flooding. These shells were taken, I suppose, from the Archaic shell middens dated by Cruxent between 800 and 3400 b.c. (Rouse and Cruxent 1963: 155-156) since Peñalver did not find evidence of habitation in these sites. She recovered several incinerated direct burials accompanied by non-utilitarian ceramic vessels interpreted as mortuary offerings (Peñalver n. d. c). The cultural affiliation of these pottery bearers is not given. Neither Cruxent nor Peñalver identified the shells that composed these large middens.

From the Río Chico site, on the central-eastern coast, Cruxent and Rouse (1958: 187) reported unidentified animal bones and marine molluscs. In the nearby Chupaquire and Cúpira sites, Nieves (1980: 293) found large quantities of *Tivela mactroides* and *Donax striatus* shells, which were collected for food, as well as several fragments of *Strombus gigas* and one fragment of *Crassostrea rhizophorae* shell.

The Valencia Basin

The quantity and diversity of marine molluscs in archaeological sites in the Valencia Basin attracted the attention of almost all explorers and archaeologists who have worked in this area. Marcano (1971[1889-92]: 43-44; 76) found shell artefacts in funerary contexts, both inside and outside urn burials. These marine specimens were more numerous than the terrestrial and fluvial molluscs together, and the *Nerita* and *Fissurella* were the most numerous. He found several spires of *Strombus* shells which were perforated so as to permit their hanging on the chest with the apex pointing out, like a nipple (Marcano 1971[1889-92]: 76). He also mentioned perforated discs or

TABLE 42. ***Taxonomic list of modified and unmodified marine molluscs recovered in Valencia-related sites in the Valencia Basin.***

Taxa	A	B	C	D	E	F	G	H	Reference
Cassis madagascariensis	-	-	-	-	-	-	-	x?	Peñalver 1981
Cassis spp.	-	x	-	-	-	-	-	-	Kidder 1944
Cassis spp.	x	-	-	-	-	-	-	-	Antczak A., personal observation 1996
Chama spp.?	-	-	-	x	-	-	-	-	Bennett 1937
Charonia variegata	-	-	-	-	-	x	-	-	Marcano 1971
Cittarium pica	x	-	-	-	-	-	-	-	Von den Steinen 1904
Columbella spp.	-	-	-	x	-	-	-	-	Kidder 1944
Conus spp.	-	-	x	-	-	-	-	-	Bennett 1937; Ernst 1873; Kidder 1944
Cyphoma gibbosum	-	-	x	-	-	-	-	-	Requena 1932
Cypraea exanthema	x?	-	-	-	-	-	-	-	Marcano 1971
Cypraea exanthema	-	-	x	-	-	-	-	-	Kidder 1944
Diodora alternata	x	-	-	-	-	-	-	-	Kidder 1944
Donax spp.	-	-	-	x	-	-	-	-	Kidder 1944
Fissurella nodosa	x	-	-	-	-	-	-	-	Kidder 1944
Fissurella spp.	x?	-	x	-	-	-	-	-	Bennett 1937
Fissurella spp.	x?	-	x	-	-	-	-	-	Marcano 1971
Fissurellidae	x?	-	x	-	-	-	-	-	Requena 1932
Isognoma alata	x?	-	-	-	-	-	-	-	Kidder 1944
Lucina jamaicensis	x?	-	-	-	-	-	-	-	Marcano 1971
*Pinctada imbricata**	-	-	x	-	-	-	-	-	Kidder 1944
Marginella spp.	-	-	x	-	-	-	-	-	Ernst 1873
Nerita spp.	-	-	x	-	-	-	-	-	Marcano 1971; Requena 1932
Nerita vesicula	-	-	x	-	-	-	-	-	Kidder 1944
Oliva jaspidea	-	-	x	-	-	-	-	-	Marcano 1971
Oliva reticularis	-	-	x	-	-	-	-	-	Kidder 1944
Oliva spp.	-	-	x	-	-	-	-	-	Marcano 1971; Bennett 1937; Peñalver n.d. c
Olividae	-	-	x	-	-	-	-	-	Requena 1932
Pitar albidus	-	-	x	-	-	-	-	-	Kidder 1944
Pitar dione	-	-	x	-	-	-	-	-	Kidder 1944
Spondylus echinatus	-	-	x	-	-	-	-	-	Kidder 1944
Spondylus spp.?	-	-	-	x	-	-	-	-	Bennett 1937
Strombus gigas	-	-	-	-	-	-	x	-	Marcano 1971
Strombus gigas	-	-	x	x	-	-	-	-	Requena 1932
Strombus gigas	-	-	x?	-	-	x	-	-	Requena 1932
Strombus gigas	x	-	x	-	x	-	x	-	Bennett 1937
Strombus gigas	x	x?	-	x	-	-	-	-	Berry 1939
Strombus gigas	-	-	x	x	-	-	x	-	Osgood 1943
Strombus gigas	-	x	-	-	-	-		-	Kidder 1944; Antczak A. personal observation 1996
Strombus gigas	-	-	x?	-	-	-	-	-	Peñalver n.d.c
Strombus pugilis	x?	-	-	-	-	-	-	-	Marcano 1971
Strombus pugilis	-	-	-	-	-	-	-	x	Peñalver 1981
Strombus spp.	-	-	x	-	-	-	-	-	Ernst 1873
Tivela mactroides	-	-	x	-	-	-	-	-	Requena 1932; Bennett 1937; Kidder 1944
Venus granulata	x	-	-	-	-	-	-	-	Kidder 1944
Voluta musica	-	-	x	-	-	-	-	-	Kidder 1944

The names of taxa in the Table are exactly transcribed from original sources. Symbols: A - unmodified; B - modified; C - pendant; D - bead; E - celt/adze; F - trumpet; G - disc; H - penis sheath. Comments: *Lucina jamaicensis* Lamarck 1801 and *L. jamaicensis* 'Spengler' Chemnitz, 1784 correspond presently to *Lucina pectinata*; *Cypraea zebra* was formerly called *Cypraea exanthema* Linné 1767; *Diodora cayenensis* (Lamarck, 1822) was previously called *Diodora alternata* Say, 1822; *Isognoma alata* = *Isognomon alatus* (Gmelin); * in original mentioned as *Margaritifera radiata*, Type Margaritiferus (Linné, 1758), Margaritifera Schumacher, 1817, radiata (Leach, 1814) is synonym to *Pinctada imbricata*, famous pearl oyster; *Spondylus americanus* was formerly called *Spondylus echinatus* Martyn; clams of Family Veneridae were formerly placed in the Genus *Venus*; *Nerita vesicula* and *Oliva jaspidea*, in both cases these presently invalid terms were formerly used to name certain *Nerita* and *Oliva* species which I could not identify. These species are reduced to their generic names *Nerita* sp. and *Oliva* sp., for comparative analyses purposes. Main utilised source: Abbott 1974.

'buttons' and zoomorphic beads carved out of *Strombus gigas* shells, as well as *Oliva* pendants (Marcano 1971[1889-92]: Fig.15, 16, 18-230). One shell of *Charonia variegata* of 162 mm in length with a spire cut off and two holes for suspension was interpreted as a musical instrument (Marcano 1971[1889-92]: 114). Marcano concluded that marine shells were used mainly as raw material for manufacture of adornos and shell trumpets or *guaruras*. Terrestrial molluscs were used for food

(Marcano 1971[1889-92]: 44). Ernst (1873: 173) described pendants made from *Conus* and *Marginella* from burial contexts in VLB.

Jahn excavated several shell adornos in burials within mounds on the eastern shore of Lake Valencia. Taxonomic identification of these molluscs was not given; however, several beads depicted in von den Steinen's description of Jahn's excavations were undoubtedly made of *Strombus gigas* shells (von den Steinen 1904: Fig. 26a, 26b). The most singular of Jahn's findings was a monkey with a shell necklace around its neck, inside a ceramic burial urn (von den Steinen 1904: 104, 106).

Requena (1932: 272; 282-3) reported 'ollas' filled with shells and other animal remains from the eastern shores of Lake Valencia, which he interpreted as remains of 'funerary feasts'. Molluscs, both in the form of manufactured artefacts and in natural state, were common in funerary urns Requena 1932: 139,141, 286, 299, 301, 313). Requena mentioned 19 shell collars and five 'guaruras' or shell trumpets extracted from these urns (Requena 1932: 132. 315). Some necklaces had beads carved in form of frogs and fishes (Requena 1932: 132). Only a few taxa can be identified from photographs of artefacts provided in Requena's publication. These are: *Strombus gigas*, *Nerita*, *Cyphoma gibbosum*, *Tivela mactroides*, *Fissurella nimbosa* and *Oliva* (Requena 1932: 47, 139, 141).

Osgood (1943: 33-36) found 1362 shell artefacts during his excavations of the mound at Tocorón. Over a thousand were small round beads found in two deposits within the clay core of the mound. The taxa of Osgood's molluscs were not identified; however, almost all the larger pendants illustrated in Figure 11 and Plate 16 of Osgood's report, were almost certainly made of *Strombus gigas* shell (Osgood 1943). Osgood supposed that 'some shell food undoubtedly was eaten' by the inhabitants of the mound; however, 'most of the utilised shells, a number of which were brought from the sea, indicate that their value lay in being a material for ornaments' (Osgood 1943: 49).

Bennett (1937: 123, Table II) recovered 667 marine shell artefacts in the La Mata site; 110 (16.5%) of them were found in the bottom, the rest in the top layer of the mound. They were grouped into eight morphological and functional categories. Unfortunately, Bennett did not identify the taxa used as a raw material. The only mentioned unmodified shells were three *Strombus gigas* specimens found in the bottom of the mound. In Figure 15 of Bennett's report (1937:121) a few taxa can be identified. In the second row there are medium disc beads, about 5 mm in diameter, made from *Spondylus* or *Chama macerophyla* (NR 7); in the third row: *Oliva* and *Conus* pendants with perforations in the posterior end (1-3), a pendant of *Fissurella nimbosa* (4), a pendant of *Tivela mactroides* (5), a *Strombus gigas* large disc, about 2.5 cm in diameter (6) and a celt and a 'bat wing' pendant (1,2), in the fourth row. According to Bennett (1937: 85, 87, 88) shell beads were the most common mortuary offering, especially in urn burials.

Kidder (1944) identified a considerable amount of marine shells in the La Cabrera site (Table 42). Given that the site was mainly a burial ground, almost all modified and unmodified specimens were recovered in funerary contexts. Burials in La Cabrera (Barrancoid) and Valencia (Valencioid) deposits contained numerous small, round flat beads which numerically dominated the sample Kidder 1944:79). Only few unmodified *Diodora* shells were found in non-burial contexts (Kidder 1944: 40-41, 78). Very singular was a discovery of 203 broken pieces of *Strombus* or *Cassis* shells. These were found in burial which comprised bones of an adult individual, partially covered by a broken urn, in a Valencia style cultural deposit (Kidder 1944: 43). All but six pieces were found inside a small ceramic jar. These shell fragments ranged from small pieces 'of thumbnail size' to some six cm in length and all parts of shell were represented; they did not show signs of work except for one pendant made of the inferior part of a spire (Kidder 1944: 78-79, Pl. 12, 35).

Kidder's shell data permit us to draw certain chronological/cultural inferences. He (Kidder 1944: 81) stated that during the early occupation of the site (La Cabrera Phase/Barrancoid style), the mortuary offerings were mainly beads and rarely pottery, while the later occupants (Valencia Phase/Valencia style) used pottery, beads and some food as mortuary offerings. He furthermore added that in the deeper layer (Barrancoid) shell pendants were rare while cylindrical and discoid beads, as well as whole shells were common. Shallower layers (Valencioid) retained the main types of beads from the deeper layers; however, whole shells were less frequent and cut-shell pendants and carved beads appeared (Kidder 1944: 82). According to Berry (1939: 558), who participated in Kidder's excavations, the *Strombus gigas* shells were prevalent in La Cabrera site and from these shells large beads were manufactured; the abundance of shell artefacts was particularly visible in shallower (Valencioid) deposits.

Peñalver mentioned presence of necklaces made of marine shells associated with burials in the La Mata (Peñalver 1967) and El Roble (Peñalver n.d. b) sites, on the eastern and western shores of Lake Valencia, respectively. In El Morro de Guacara on the northern lake shore, she found 21 marine shells and four *guaruras*, probably, the *Strombus gigas* trumpets (Peñalver n.d. c). A direct burial of a man with a collar of *Oliva* shells around his neck was also recovered in this site. Given that these human bones were dated to 4400 b.p. this is, undoubtedly, the earliest dated evidence of marine shells adornos from the north-central Venezuela. During excavations in the mounds in La Mata and La Pica, on the eastern lake shores, Peñalver found 20 marine shell artefacts interpreted as penis sheaths (Peñalver 1981: 25, 33). She stated that 17 of them were made from *Strombus pugilis*, two from *Cassis madagascariensis* and one from unidentified shell; however, on the photograph which accompanied the publication almost exclusively spires of *Strombus gigas* can be recognised (Peñalver 1981: 25; 33, Photographs 4 and 5; see also Sutty 1991: 339 who was the first in noting these erroneous taxonomic identification. It should be added that complete adult shells of *Strombus* *pugilis* have a length of between 7.5 and 10 cm (Abbott 1974: 143; Morris 1975: 169). When the body whorl is eliminated from the shell, then the spire measures between two and three cm, and its suitability for the purpose suggested by Peñalver may be questioned. It should also be remembered that *Strombus* shell artefacts almost identical to these found by Peñalver, were interpreted by Marcano (1971[1889-92]: 76) not as penis sheaths but as pendants. Finally, analysing the data given by Peñalver (1981), I found that these supposed penis sheaths were recovered on the eastern shore of the lake while on the opposite shore, in the Los Cerritos site, perforated '*Pomacea* and *Urseus*' landshells were used as penis sheaths. These taxonomic citations are misleading since '*Urseus*' is a specific adjective of *Pomacea urceus* taxon but not a genus name (R. Cipriani, personal communication 1997). The above mentioned dichotomy in the distribution of *Strombus* and *Pomacea* artefacts may indicate cultural variability within Valencioid societies or may suggest that *Strombus* shell spires were, in fact, pendants and not penis sheaths, as originally suggested by Marcano (1971[1889-92]. It is noteworthy that *Pomacea* and *Ampullaria* shells were reported as penis sheaths from non-Valencioid sites to the west, particularly from the Venezuelan Andes (personal observation in the Museo Arqueológico of Mérida, 1985; see also Sutty 1991: 338).

In 1996, I collected several *Strombus gigas* shell fragments from the surface of the La Cabrera site, in the surroundings of the 'old' Kidder trench. These specimens were dug out and abandoned by looters. In private collection in Maracay I examined several *Strombus gigas* shell artefacts such as carved pendants, large, rectangular beads and dozens of unmodified fragments. There were also large numbers of *Nerita* shells, as well as one whole *Cassis*, all of them recovered from the La Cabrera site. I also examined one *Strombus gigas* shell pendant with complex zoomorphic carvings of clearly Barrancoid origin which suggests that elaborate shell carvings were not exclusively Valencioid. All the shell remains that I could analyse personally were badly weathered and chalky specimens. This poor state of conservation precludes the distinction between originally worn specimens, those that might have been collected from the beaches, from those molluscs purposefully collected for food and later on, used as raw material.

In conclusion, all marine shells from the VLB sites are recent West Indian forms. The use of shell adornos as burial offerings is documented since Archaic times, about 2000 years b.c., in the VLB. During the Barrancoid occupation of the Basin (a.d. 250 to 500-600 approximately), shell beads were profusely, albeit not exclusively, used as burial offerings. Between a.d. 900 to 1500, during the succeeding Valencioid occupation, the quantity and diversity of marine molluscs, as well as of forms and representations carved in shell, reached its climax. Beads and pendants were the most popular shell adornos while shell utensils were rare. Stylised figures of aquatic animals such as frogs, turtles and fishes were the representations most frequently carved. Less popular were stylised motifs of a human figure and a bird. Although the majority of Valencioid shell adornos were reported from mortuary contexts they were also found, although less frequently, in habitation mounds. Marine shells were, by far, the preferred raw material for shellwork, in comparison to landshells, and *Strombus gigas* was the most popular and versatile marine mollusc for both Barrancoid and Valencioid occupants of the VLB. Several researchers observed (Marcano 1971[1889-92]: 44; Osgood 1943: 49) that the marine molluscs were almost exclusively used as raw material, and not for food, by the VLB inhabitants. However, the nature and quantity of mollusc flesh (salted and/or dried) from the coast and/or islands into the VLB, cannot be assessed by the available direct archaeological evidence. Coarse-grained resolution of the non-ceramic data, due, in part, to deficiencies in recovery techniques (i.e. lack of fine mesh sieving), severely restricts construction of such inferences.

Molluscs: Between islands and mainland

This section discusses subjects selected from the comparative analyses of molluscan assemblages from the Valencioid sites in Los Roques Archipelago (DM site mainly) and from the north-central Venezuelan mainland (coast and VLB). The data are compared and discussed in four thematic categories: (1) taxonomic, (2) modified and worked shell artefacts, (3) edible/non-edible molluscs, (4) and contextual associations. The biogeography and ecology of archaeologically recovered molluscs is discussed in order to determine whether or not the distribution of their habitats and availability may be causally related to the flow of shells and shell artefacts within and between Amerindian societies of islands, coast and inland (VLB).

I am fully aware of the limitations of these comparative analyses and the conjectural character of the interpretations. Such comparative analyses between assemblages recovered by means of different fieldwork techniques, which, very often, lack any contextual data, lead inevitably to dubious interpretations. However, pointing out some clearly visible patterns that result from these analyses may be useful to guide future research.

Taxonomic correlation

If we take as 100% the 81 different mollusc taxa found in the DM site, then 17.2% (N=14) and 30.8% (N=25) of this amount were recovered from coastal and VLB Valencioid sites, respectively. The comparison of the two last figures indicates that inland Valencioid sites yielded nearly twice as many taxa as the coastal sites. This contrast, if confirmed, is quite significant. Leaving the interpretation of these intriguing data for later discussion, I want to draw attention to seven taxa recovered from VLB sites but which are not present in the DM site (Table 43).

Fissurella is a limpet with natural orifice at the top of the shell, and, therefore, it may be considered as a 'natural bead' (see Francis 1982: 712). This is the only mollusc among the taxa in

TABLE 43. ***Molluscs recovered from Valencioid sites in the VLB but not recovered from DM site; their distribution and availability in insular and coastal environments.***

Recovered from Valencioid sites in the VLB but not recovered from DM site.	Availability in Los Roques Archipelago	Availability in continental rocky coast	Accessibility in ideal habitat	Presence/ absence in Valencioid coastal sites
Fissurella nimbosa	x	E	E	x
Cassis madagascariensis	-	H	H	-
Donax spp.	-	H	E	-
Pitar albidus	x	H	M	-
Pitar dione	-	H	M	-
Diodora alternata	-	M	M	-
Isognomon alatus	x	M-E	E	-

Sources of data: Column 1: refer to Table 38; Column 2: R. Cipriani, unpublished research results; Rehder 1962; Work 1969; Columns 3 and 4: R. Cipriani, unpublished research results; Columns 5 see Table 41. Abbreviations: E=easy, H=hard or not found, M=medium.

Table 43 that was found in both VLB and coastal sites but not recovered at DM. Fissurellidae are easy to collect and relatively abundant molluscs in Los Roques islands and the central Venezuelan coast (Rehder 1962; Work 1969; R. Cipriani, personal communication 1997). In consequence, I assume that the majority of archaeological specimens were collected on the coast and not on the islands.

Members of the genus *Cassis* are inhabitants of calcareous sandy substrates and habitually live in moderately deep water between three and six meters (Abbott 1974: 161). Given their naturally low densities and the necessity to dive for extraction they are not easily available molluscs, even in their preferred habitat. In Los Roques they are relatively rare species (Work 1969). However, it is almost impossible to find them alive on the Venezuelan rocky coast since it lacks their natural habitats. The closest area where the Valencioid people could have found these molluscs in their natural habitat is to the west of Puerto Cabello (see Penchaszadeh 1979; 1983; Döering and Bone 1983), especially in the area of the Morrocoy National Park cays and in the area of Barlovento, to the east of the central coast. These areas are characterised by shallow water with basically biogenic sediments, with mangroves, coral reefs and patches of sea-grass beds. They might have sheltered similar marine fauna to that of the Los Roques islands, even though the physical-chemical conditions seem to be divergent between these areas (R. Cipriani, personal communication 1997). A few whole and/or modified, *Cassis* shells were reported from VLB while *Cassis flammea* and *tuberosa* were found in the DM and CS/D insular sites. None of these shells was recovered from the coastal sites. These data suggest that *Cassis* shells may have been such highly valued items for Valencioid people that almost all specimens found in the islands were scrupulously sent inland. Moreover, the absence of *Cassis* shells in coastal sites, but presence of semi-entire shells in the VLB, seem to suggest that the shells collected in Morrocoy/Barlovento areas were also shipped to the interior, without being stored or processed in coastal settlements.

TABLE 44. ***Molluscs recovered from insular, coastal and inland Valencioid sites, their distribution and availability in insular and coastal environments.***

Molluscs recovered in DM site	Availability in the Los Roques Archipelago	Availability in the continental rocky coast	Accessibility in an ideal habitat	Presence/ absence in Valencioid coastal sites	Presence/ absence in Valencioid sites in VLB
Aequipecten spp.	x	H	M	-	-
Americardia media (Linné, 1758)	x	H	H	-	-
Amphineurans	x	E	E	X	-
Anadara notabilis (Röding 1798)	-	H	H	-	-
Anadara spp.	x	H	H	-	-
Arca zebra (Swainson, 1833)	x	H	E	X?	-
Arcopagia fausta Pulteney, 1799	x	H	H	-	-
Asaphis deflorata (Linné, 1758)	x	H	E	-	-
Astraea spp.	x	E	E	-	-
Bulla striata Bruguiére, 1792	x	M-H	E	-	-
Bursa corrugata (Perry, 1811)	x	M?	H	-	-
Cassis flammea (Linné, 1758)	x	M-H	H	-	X?
Chama macerophyla	x	E	E	-	X
Chamidae	x	E	E	-	-
Charonia variegata (Lamarck, 1816)	x	E-M	H	-	X
Chicoreus brevifrons (Lamarck, 1822)	x	E-M	E-M	-	-
Chione paphia (Linné, 1758)	x	M-H	E-M	-	X?
Chlamys imbricata (Gmelin, 1791)	x	M	M	-	-
Cittarium pica (Linné, 1758)	x	E	E	-	X
Codakia orbicularis (Linné, 1758)	x	M-H	M-H	X	-
Columbellidae	x	E	E	-	X
Conus spp.	x	E	H	X	X
Crepidula fornicata	x	E	E	-	-
Cymatium pileare (Linné, 1758)	x	E-M	H	-	-
Cyphoma gibbosum (Linné, 1758)	x	E	E	-	X
Cypraea cinerea Gmelin, 1791	x	E	H	-	-
Cypraea spp.	x	E	H	-	X
Cypraea spurca acicularis Gmelin, 1791	x	E	H	-	-
Cypraea zebra (Linné, 1758)	x	E-M	H	-	-
Cypraecassis testiculus (Linné, 1758)	x	E	H	-	-
Diodora listeri (Orbigny, 1842)	x	E	E	-	X?
Fasciolaria tulipa (Linné, 1758)	x	M	M	-	-
Glycymeris americana (DeFrance, 1829)	x	H	H	-	-
Glycymeris decussata (Linné, 1758)	x	H	H	-	-
Glycymeris pectinata (Gmelin, 1791)	x	H	H	-	-
Glycymeris undata (Linné, 1758)	x	H	H	-	-
Haustellum messorius (Sowerby, 1841	x	M-H	E-M	-	-
Laevicardium laevigatum (Linné, 1758)	x	H	E-M	-	-
Latirus infundibulum (Gmelin, 1791)	x	H?	H	-	-
Leucozonia nassa (Gmelin, 1791)	x	E	E	-	-
Leucozonia ocellata (Gmelin, 1791)	x	E	E	-	-
Lithopoma caelata (Gmelin, 1791)	x	E	E	-	-
Lithopoma spp.	x	E	E	-	-
Lithopoma tecta (Lightfoot, 1786)	x	E	E	-	-
Lopha frons (Linné, 1758)	x	E	E	-	-
Lucina pectinata (Gmelin, 1791)	x	H	H	X?	X
Lyropecten nodosus (Linné, 1758)	x	H	H	-	-
Macrocallista maculata (Linné, 1758)	x	H	H	-	-
Marginella prunum (Gmelin, 1791)	-	H	E	-	-
Marginellidae	x	M	M	-	X
Melongena melongena (Linné, 1758)	x	H	E	-	-
Modiolus americanus (Leach, 1815)	x	M-H	E	-	-
Murex macgintyi M. Smith, 1938	x	H	H	-	-
Natica canrena (Linné, 1758)	-	H	H	-	-
Nerita peloronta (Linné, 1758)	x	E-M	E	-	-
Nerita versicolor Gmelin, 1791	x	E	E	X?	X
Oliva reticularis Lamarck, 1810	x	H	E-M	-	-
Oliva spp.	x	M-H	M-H	X	X
Olivella spp.	x	M	M	-	-
Olivellidae	x	M	M	-	-
Pecten ziczac (Linné, 1758)	x	H	H	-	-
Pectinidae	x	M-H	M-H	-	-
Periglypta listeri (Gray, 1838)	-	H	H	-	-

TABLE 44. (cont.)

Molluscs recovered in DM site	Availability in the Los Roques Archipelago	Availabilty in the continental rocky coast	Accessibilty in an ideal habitat	Presence/ absence in Valencioid coastal sites	Presence/ absence in Valencioid sites in VLB
Phalium granulatum (Born, 1778)	x	H	H	-	-
Pinctada imbricata Röding, 1798	x	M-H	E	-	X?
Pinna carnea Gmelin, 1791	x	M	E	-	-
Pisania pusio (Linné, 1758)	x	M?	M	-	-
Polinices lacteus (Building, 1834)	x	H	M-H	-	-
Pseudochama radians (Lamarck, 1819)	x	E	E	-	-
Pteria colymbus (Röding, 1798)	x	M	E-M	-	-
Spondylus americanus Hermann, 1781	x	E-M	E-M	-	X
Strombus costatus Gmelin, 1791	x	H	M-H	-	-
Strombus gallus (Linné, 1758)	x	H	M-H	-	-
Strombus gigas Linné, 1758	x	H	E	X	X
Strombus pugilis (Linné, 1758)	x	M-H	E-M	-	X
Strombus raninus Gmelin, 1791	x	H	M-H	-	-
Tellina listeri Röding, 1798	x	H	M-H	-	-
Tellina radiata Linné, 1758	x	H	M-H	-	-
Thais deltoidea (Lamarck, 1822)	x	E	E	X?	-
Thais rustica (Lamarck, 1822)	x	M-H	E	-	-
Tivela mactroides (Born, 1778)	-	H	E	X	X
Tonna maculosa (Dillwyn, 1817)	x	H	H	-	-
Trachycardium isocardia (Linné, 1758)	x	M?	M	-	-
Trachycardium magnum (Linné, 1758)	-	H	H	-	-
Trachycardium muricatum (Linné, 1758)	x	M	M	-	-
Trachycardium spp.	x	M-H	M-H	-	-
Turbo canaliculatus Hermann, 1781	-	H	H	-	-
Vasum capitellum (Linné, 1758)	x	M-H	M	-	-
Ventricolaria rigida (Dillwyn, 1817)	-	H	H	-	-
Vermetidae	x	E	E	-	-
Voluta musica (Linné, 1758)	x	H	M-H	-	X

Sources of data: Column 2: Rehder 1962; Work 1969; see also Table 38. Column 3: Flores 1964; Almeida 1973; Cervigón et al. 1992; R. Cipriani unpublished research results. Columns 4: R. Cipriani, unpublished research results. Columns 5 and 6 see Tables 41 and 42. Legend: Column 1 enumerates marine mollusc taxa recovered in DM site; Column 2 specifies whether a given taxa was reported (x) alive or dead from Los Roques Archipelago or not (-). Column 3 indicates how hard is to find alive a given taxon on the central and central-western Venezuelan rocky coast. Column 4 measures how difficult is to obtain a given taxa in its ideal habitat by a human collector. It indicates a gross measure of human effort, need for technological complexity and co-operation in pursuit of a given taxa in its ideal habitat. For instance, a given species which is not a 'rare' mollusc in terms of its relative abundance may be rarely gathered due to its cryptic habits, its custom to bury in deep sediments or its habit to uncover during the night only. Some species may be hardly found even in their ideal habitats due to their low natural densities. Column 5 specifies whether a given taxa was reported (X) or not (-) Valencia style-related sites from the north-central Venezuelan coast. Column 6 specifies whether a given taxa was recovered (X) or not (-) from the Valencia style-related sites in the VLB. X? - indicates that not the same species but other member of the same genera was recovered. Abbreviations: E=easy, H=hard or not found, M=medium.

Donax is the only taxon from the Table 43 that does not inhabit rocky shores and has not been reported in Los Roques Archipelago (Rehder 1962; Work 1969; R. Cipriani, personal communication 1997). The natural habitats of this mollusc are beyond the islands and the central coast. These habitats are the sandy bottoms of Tucacas, a part of the Morrocoy National Park, and the coasts of Barlovento (see Almeida 1973). Given that *Tivela* molluscs were reported as dominant species from Valencioid sites in Cúpira and Chupaquire, to the east of Barlovento (Nieves 1980), it seems highly probable that the Valencioid people from VLB, as well as the insular Valencioid societies, obtained this species from that area. However, both *Tivela* and *Donax*, as well as other non-rocky shore dwellers, might have also been collected and exported to the VLB from their natural habitats in the area of Morrocoy, on the western frontier of the Valencioid Sphere of Interaction. Moreover, they might have been collected even closer to the VLB, at the El Heneal site, on the way from Morrocoy to Puerto Cabello. At El Heneal, Cruxent (Cruxent and Rouse 1958: 141-144) excavated a large Archaic shell midden dated to 1550 b.c. (Rouse and Cruxent 1953: 155). This midden was largely composed of *Donax variabilis* and *Tivela mactroides*. Other molluscs such as *Neritina virginea, Melongena melongena, Melampus coffeus* and *Ostrea*, were also found (Cruxent and Rouse 1958: 142). This evidence indicates that empty *Donax* and *Tivela* shells might have been collected from the El Heneal shell mound and from there shipped to the VLB. Short distance and easy natural paths that connect El Heneal and the VLB would facilitate this processes. I do not suggest, however, that the availability of live *Donax* and *Tivela* molluscs might have been the same during the late prehistoric times as it was almost 3.000 years before in the El Heneal coast. It is probable that this availability changed due to the overall environmental changes and the effects of anthropic factors. The question of the provenance of the VLB *Tivela* and *Donax* shells can not be resolved until pertinent palaeoecological research is carried out on the western Venezuelan coasts. However, these species which are common in all coast of Falcón State, to the west, may have also been traded with Dabajuroid people, who dominated that coast.

Pitar albidus and *Pitar dione* are moderately common inhabitants of sandy bottoms and shallow waters (Abbott 1974: 530) and, in consequence, they had to be collected from other environments than the rocky shore. Only one dead shell of *Pitar albidus* was reported from Los Roques islands while the second species was not reported at all (Rehder 1962; Work 1969). Their scarcity in modern samplings may be indicative of low densities of these molluscs in Los Roques islands. If so, than these molluscs, especially *Pitar dione*, were probably collected in habitats that better match their ecological roles, such as Tucacas and Barlovento areas (Almeida 1973; R. Cipriani, personal communication 1997), and from there brought to the VLB.

Diodora alternata was not recovered in the DM site; however, one shell of another member of this genus, *Diodora listeri*, was found in this site. Alive and/or worn shells of *Diodora* may be found with relative ease around Dos Mosquises Island and on the continental shore. In consequence, I assume that these shells might have been brought to the VLB from the rocky central coast than transported from the islands to the mainland.

Isognomon alatus is a species relatively easy to gather on the rocky shores of the central coast and mangrove areas of Morrocoy (R. Cipriani, personal communication 1997). It was also reported from Los Roques islands (Work 1969). Like *Diodora alternata* it might have been collected in both environments.

In conclusion, three molluscs from Table 44 *Cassis*, *Donax* and *Pitar*, were almost surely collected on the very peripheral coastal areas of the Valencioid Sphere of Interaction and from there 'exported' toward the core area of the Valencia Basin.

Another mollusc that should be discussed briefly is *Plicopurpura patula*, the only species that was reported only from the coastal sites. It inhabits both coastal (R. Cipriani, personal communication 1997) and insular environments (Work 1969). Its absence in VLB and DM sites may suggest that the Valencioid people did not take advantage of the dyeing properties of this mollusc and exploited it only marginally.

The next step of my analyses is to compare sets of data included in the columns of Table 44). The presence of marine shells in the VLB sites implies some means of anthropic transmission, whether trade or seasonal human population movements. My goal is to determine why certain shells collected on the islands (at the DM site) might have been exported into the VLB, assuming that the VLB was a core area of the Valencioid Sphere of Interaction and that the societies of this area were both demanding molluscs and controlling their influx. By 'indirect export' (see Table 45) I mean that both Valencioid and/or non-Valencioid coastal societies were exchanging the insular/coastal shells with core Valencioid societies from the VLB. The term 'direct export' implies that fractions of Valencioid core societies were moving seasonally between the VLB and the coast and participating in voyages and extraction of insular resources. The data indicate that 70.5% (N=12) of taxa recovered both in DM and VLB sites were not found in coastal sites (Table 44). Were than these molluscs 'exported directly', without intermediaries, from the peripheral islands to the core area of VLB, during the late prehistoric/protohistoric times?

29.5% (N=5) of the taxa recovered from the VLB and DM sites were also found in the coastal sites (Table 44). Could this mean that the molluscs were stored and/or worked (preforms and/or finished objects) on the coast and from there redistributed to the VLB? To discuss these matters, I should firstly assess the relative popularity of each taxon in coastal and VLB sites and, then, determine whether given molluscs were collected on the coast, on the island, or in both environments. It should be also established which molluscs might have been used for food, as raw material, and/or for other purposes, by the Valencioid people settled on the coast and in the VLB.

The detailed data that would allow me to estimate the popularity of given taxa within coastal or VLB molluscan assemblages do not exist. In this situation I have to call in the aid of a highly controversial (but the only available) method. This consists of counting how many times any given taxon was mentioned in original reports of archaeological excavations and/or unsystematic explorations in VLB (Table 42). In this way I obtain an approximate measure of the popularity a given taxon might have had among the VLB inhabitants. This measure should not be confused with an actual measure of quantity of shells or artefacts made of molluscs of a given taxon but considered as a rough approximation only. If anything, this exercise shows the potential that such comparative studies, based on sound contextual data, would provide in shedding light on the nature of marine shell trade network throughout the region.

TABLE 45. ***Hypothetical construction of patterns of collection and importation of marine molluscs from the central and central-western Venezuelan coast and/or from the DM site into the Valencia Basin.***

Molluscs recovered from Valencioid sites in both, Dos Mosquises Island and VLB	'Export' to VLB*	Where and how the molluscs might have been collected
Strombus gigas	indirect?	Collected alive and/or washed ashore on the islands, in abundance, or, in very reduced numbers, beyond the central coast, in areas de Barlovento or Morrocoy
Cassis spp.	direct	Collected washed ashore and/or alive on the islands and/or beyond the central coast, in the areas of Barlovento or Morrocoy; always in very reduced numbers
Voluta musica	direct	Collected washed ashore and/or alive in the islands and/or on the coast
Pinctada spp.	direct	Collected washed ashore and/or alive in the islands and/or on the coast
Strombus pugilis	direct	Collected washed ashore and/or alive in the islands and/or on the coast
Oliva spp.	indirect	Collected washed ashore and/or alive in the islands and/or on the coast
Lucina pectinata	indirect	Collected washed ashore and/or alive on the islands and/or on the coast
Cypraea spp.	direct	Collected alive and/or washed ashore in the coast and/or on the islands
Conus spp.	indirect	Collected washed ashore and/or alive on the coast and/or in the islands
Charonia variegata	direct	Collected washed ashore and/or alive on the coast and/or in the islands
Marginellidae	direct	Collected washed ashore and/or alive on the coast and/or in the islands
Spondylus americanus	direct	Collected washed ashore and/or alive on the coast and/or in the islands
Chama macerophyla	direct	Collected easily alive and/or washed ashore on the coast
Cittarium pica	direct	Collected easily alive and/or washed ashore on the coast
Cyphoma gibbosum	direct	Collected easily alive and/or washed ashore on the coast
Diodora listeri	direct	Collected easily alive and/or washed ashore on the coast
Nerita spp.	indirect	Collected easily alive and/or washed ashore on the coast

* 'Direct export' records that given mollusc was not reported, in the form of worked, modified nor unmodified shell, from the coastal Valencioid sites. Therefore, the molluscs might have been transferred directly from the insular campsites to the VLB site(s). 'Indirect export' implies that given species was reported from the coastal sites. It may be indicative that the flow of these molluscs from marine environs to the VLB depended on different kind of social interaction than in the case of 'direct export'.

In Table 45 I outlined strategies that might have been used by the Valencioid people to collect those marine molluscs which were found in both insular (DM) and VLB archaeological sites. The most numerous and polyvalent marine mollusc recovered in VLB sites is, by far, the *Strombus gigas*. Modified and unmodified shells, as well as artefacts made of these shells were described by nine authors of VLB archaeological reports; phenomenon which, in part, may be explained by the fact that the *Strombus gigas* shells are the most conspicuous and easiest to identity in the archaeological record. This gastropod was collected for food and as raw material, alive and/or washed ashore, principally on the Los Roques Archipelago islands. Very small numbers of *Strombus gigas* shells might have been collected in Morrocoy and Barlovento areas, to the west and east of the central coast. A few specimens might have even been found in some of the central coast bays (Flores 1964). Undetermined fragments or modified *Strombus* shells were associated with El Topo Valencioid sites, on the central littoral, this being the only major concentration of these shells in all of the central coast.

Oliva are the second most popular taxa in the VLB. They are mentioned in five reports. This mollusc might have been collected easily in both insular and coastal environments and was recovered in insular, coastal and VLB archaeological sites. Given the high popularity and, availability, as well as easy accessibility of *Oliva* on the coast, this mollusc might have been used by

VLB societies long before they gained the access to the insular environments. The human skeleton from El Morro de Guacara site which was found with *Oliva* shell necklace around his neck, dated to 4400 b.p. (Peñalver n.d. c), seems to strengthen this supposition.

The third most popular molluscs in the VLB are Fissurellidae. As has been already mentioned, these species are easily and massively accessible on the coast. In consequence, I suggest that, like *Oliva*, these molluscs might have had a very long tradition of use for different VLB societies.

Cassis, *Conus* and *Nerita* are the next in the list of popularity. Three authors mentioned each of these taxa in the VLB sites. *Cassis* is an uncommon inhabitant of insular and coastal environs and for this reason, and due to its large dimension and special aesthetic features of its shell, it might have been a highly coveted species. Shells of *Cassis* were never collected in abundance, and all of them were probably shipped directly to the VLB without intermediary 'stops' in coastal sites. *Conus* and *Nerita*, might have been, in contrast to *Cassis* and *Strombus*, collected alive or dead on the coast and/or on the islands. What were all these molluscs used for by the Valencioid societies?

Unmodified and edible mollusc correlation

It is interesting to observe that 40% (N=10) of taxa recovered in the VLB sites were represented by both unmodified specimens and artefacts made of them (Table 44). This indicates that considerable quantities of whole marine shells were reaching VLB sites. Do these shells represent food debris or raw material?

What data from the coastal assemblages may be added to enrich the discussion of these questions? Large quantities of *Tivela* and *Donax* shells recovered in peripheral Cúpira and Chupaquire Valencioid sites, may be, with confidence, considered as food remains. The same may be said, though with major reserve, about the abundant *Nerita* shells accompanied by *Codakia* and *Arca*, recovered by Martín (1995) at the inland located La Cesiva site. It is possible that the undetermined scatters of *Strombus gigas* shells reported by Dupouy and Cruxent (1946) in the El Topo site, may, in part, represent food and, in part, manufacture debris. The real role of Amphineurans in the diet of coastal Valencioids is, I am convinced, undervalued due to under-representation or absence of their remains in inadequately recovered coastal samples. Lack of contextual data and fine mesh sampling severely constrains any effort to further discriminate between food debris, raw material and manufacturing debris in coastal molluscan assemblages.

However, despite this precarious state of coastal archaeology one significant piece of evidence demands for attention. This is the absence of such highly valuable edible molluscs as *Chama macerophyla* and *Cittarium pica* in coastal molluscan assemblages. This absence is remarkable, given that both species are abundant and easily accessible on the rocky coast. As shown in Table 44 several other edible molluscs, including Amphineurans, are relatively abundant on continental rocky shores. Anderson (1981: 111), who studied the prehistoric rocky shore shell middens in Palliser Bay, New Zealand, concluded that 'rocky shores lose little, if anything, by comparison with soft shore resource zones'. Had the edible molluscs on the Venezuelan central coast been collected for food opportunistically only, or had they been collected purposefully but discarded 'strictly' beyond the areas of the settlements? Given the overall data discussed, thus far, on Valencioid archaeomalacology, I favour the first hypotheses. If this absence, or unexpectedly small quantity, of edible molluscs is confirmed in future research on the central and central-western coasts, it may be indicative of a very marginal role they had in coastal subsistence economies of the Valencioid people. If the Valencioid coastal people did not take advantage of abundant and edible rocky dwelling molluscs, easily accessible from their settlements, then could they be considered newcomers to the coast who were not familiarised enough with the new environment? Or could it be rather a question of culturally determined selectivity of the coastal Valencioids. The non- or very low exploitation for food of available molluscs may indicate that subsistence was satisfactorily secured by other means. The data indicate that the subsistence economy of coastal Valencioids was based on the exploitation of mixed marine/terrestrial resources (Alvarez and Casella 1983; Morales 1984). However, regarding the marine component of the subsistence economy the question remains: Were the coastal Valencioids so specialised in the exploitation of some much more productive marine resources so that these edible molluscs might have been left almost ignored?

Manufactured objects correlation

Small and medium size round flat beads, which were the most numerous artefacts within the worked shell category at DM (48%), also dominate Valencioid assemblages from La Mata (Bennett 1937) and Tocorón mounds (Osgood 1943), as well as Barrancoid and Valencioid burial contexts in the La Cabrera site (Kidder 1944). The absence of these tiny artefacts in other report, may be, in part, a result of inadequate recovery technique (fine mesh sieving) rather than of their real absence in the sites. Small round beads were made mainly of some whitish shell, probably *Strombus* while medium size beads, were made of *Spondylus americanus* and/or *Chama macerophyla* bivalves, both at the DM and VLB sites. *Tivela mactroides* pendants from the VLB sites (Requena 1932; Bennett 1937; Kidder 1944) have several counterparts in Dos Mosquises Island and other Valencioid insular sites. One carefully made *Strombus gigas* celt was reported from La Mata mound (Bennett 1937: 124) and only one probable celt was found in the DM site. Several shell celts/axes were reported from the central Venezuelan coast (Oramas 1940; Dupouy and Cruxent 1946). They were a part of the cultural baggage of Valencioid pottery-bearers of El Topo style, who inhabited in late prehistoric and, probably, early protohistoric times, the mountain slopes of the central coast. As far as I know, shell celts/axes are, in general, an uncommon feature on late prehistoric sites on the Venezuelan coasts and islands (i.e. Cruxent and Rouse 1958; Nieves 1980; Martín 1995; Serrand 1997; Dacal Moure 1997). Lacking any contextual associations of coastal shell axes, and given their near absence from VLB sites, it may be hypothesised that their use was implicated in some activities related to the coastal environment. In consequence, I suggest that they might have been used in the process of sea-going canoe-making. Given that stone tools are relatively abundant in these coastal sites (see Dupouy and Cruxent 1946) why then would shell axes have been necessary for canoe-making? The association of shell implements, especially the *Strombus gigas* shell gouge, with canoe-making was suggested by Rouse and Cruxent (1963: 45-46) for the eastern Venezuelan Manicuare complex, dated to between 1730 and 1190 b.c. (see also Armstrong 1980: 153). Once the Archaic people with developed shell technology had arrived at the rocky shores of the central coast they encountered there abundant lithic resources. What advantage would a shell gouge/adze have over its lithic counterpart? My suggestion is that the reason for use of shell adzes by the Ceramic people, was not simple 'functionality'. It is probable that the use of *Strombus* shell axes in canoe-making might have been a symbolical heritage which the late prehistoric ceramic makers inherited from the Archaic inhabitants of the coast. These curious cases of cultural preference have also been reported from the Pacific Islands (Poulsen 1970: 36; Rawson 1988: 21) where, as in the Caribbean, they also wait to be explained.

Several molluscan artefacts from DM have no counterparts in mainland sites. These artefacts are fragments of bent tubular objects interpreted as broken nose rings, or fishhooks and worked nodes or spines of *Strombus gigas* interpreted as preforms for ear-plugs or three-pointed objects (Figure 87). Shell trumpets were not identified in the insular sample; however entire shells and/or unrecognisable trumpet preforms might have been brought from the islands.

Scrapers/cutters made of *Codakia orbiculata* valves, like the already described insular specimens, are not reported from the coast nor from the VLB. The absence of these tools in coastal sites should be taken with reservations since, I suggest, they might have been recovered but not identified as such. *Codakia* shells were recovered from coastal sites (Martín 1995) and live specimens may be found in coastal habitats, especially associated with *Thalassia testudinum* beds in the Morrocoy area (Roberto Cipriani, personal communication 1997). I suggested previously that the use of *Codakia orbiculata* scrapers/cutters might have been restricted to marine environment-related activities. It seems highly probable they were used for scaling and cleaning fishes and/or for processing other marine organisms. Additionally, they might have also been used for peeling roots and sharpening wooden sticks and arrows (see Hartmann 1986 for examples from Xingú area, Brazil). These functional inferences may be strengthened by the fact that only four lithic scrapers found at DM (Table 70). If the *Codakia* shells with damaged margins cannot be considered tools for scraping and cutting, how can we explain the presence of only two lithic scrapers/cutters in such a large and multifunctional campsite as that on the Dos Mosquises Island?

Whether the *Codakia* shells found in coastal sites might have been used as cutters/scrapers or not is impossible to assess. It may be expected that these shell tools were replaced by stone scrapers on the coast, where suitable lithic raw material is available in abundance (see for example Donnan and Moseley 1968). Interestingly, Martín (1995) described a relatively reduced number of quartz scrapers from the coastal sites. This evidence may suggest that *Codakia* shell scrapers/cutters may be found in future excavations in coastal sites and, therefore, that they pertained to the specialised kit tool of marine oriented Valencioid societies. However, they might have been tools restricted to the processing of specific insular resources, such as turtles (see Akerman 1975: 16) and *Strombus gigas* meat.

Finally, it should be emphasised that no finished pendants of *Oliva* and *Conus*, which were reported from almost all VLB sites, were found at DM. However, over 150 of these shells, several with spires removed perpendicular to the body axis by natural agents and found in the DM site, may indicate that these 'natural preforms' might have been taken to the continent for further elaboration. The same may be said of *Nerita* and *Columbella* shells, since not one of the insular specimens showed artificial perforation.

Carved pendants are poorly represented at DM, in comparison to mainland sites; they are even more rare in coastal sites. A finely carved, tiny shell pendant from DM that represents a small bird has its counterparts in lithic specimens reported by Kidder (1944: Plate 11, 43). Kidder (1944: 49) found seven identically carved bird effigies in the bowl-urn burial of an infant, associated with a shell necklace, figurine and small vessels; another infant burial was placed in proximity. Bennett (1937: 127, Fig.17) also found a small bird effigy carved in stone but without perforation; he called it an 'amulet'. The only bird pendant in shell was recovered by Requena (1932: 143) who believed it represented a condor. No bat winged pendants like those from La Mata (Bennett 1937) and Los Teques (Oramas 1940), or others I viewed in private collections in Caracas, were recovered in the DM. Other mainland artefacts such as *Strombus* spires interpreted as penis sheaths, pendants or thick tubular beads (Osgood 1943: Fig.11 A, B; Bennett 1937: 122) were also absent at DM.

Conclusions

Preliminary conclusions about mollusc exploitation strategies and flow of shell artefacts between different ecological and geographical zones within the Valencioid Sphere of Interaction, as well as about their economic importance and social and symbolic uses, may be outlined. A wide range of molluscs were gathered by the Dos Mosquises site occupants but the only species in large collected for food was *Strombus gigas*. These shells dominate almost all molluscan assemblages in the Valencioid insular sites. Most of the non-*Strombus* gigas shells were worn, washed ashore specimens. Only some of them were collected for raw material, and small scale shellwork might have taken place in the DM site. However, the majority of worn shells were brought to the campsite for unknown reasons. The minority of non-*Strombus gigas* molluscs were edible species collected only incidentally for food. In conclusion, some molluscs were eaten and some shells were used for utilitarian purposes (scrapers-cutters, awls, pounding tools) in the insular sites. In addition, the evidence suggest social and, possibly, ceremonial use of marine molluscs in the islands, mainly the *Strombus gigas* species.

Moving from the islands to the central and central-western Venezuelan coasts, the scarcity *of Strombus gigas* remains is striking. Who were the receptors of the insular molluscs? The absence of such valuable edible molluscs as *Cittarium pica* and *Chama macerophyla* in coastal sites is another intriguing evidence. It should be emphasised that these coasts do not offer habitats adequate to sustain large populations of the *Strombus gigas* molluscs; however, they do provide nearly ideal habitats for the two other edible species. Their absence from archaeological record may be indicative of the marginal role marine molluscs played in the diet of Valencioid coastal people. The panorama changes when moving beyond the rocky shore toward the sandy beaches in the area of Barlovento, to the east. *Tivela* and *Donax* shells were intensively exploited for food by the peripheral offshoots of the Valencioid people, settled at the Cúpira and Chipaquire sites. It is from there that the shells of these two species might have been brought to the VLB. This may indicate that the Valencioid societies from the area of Barlovento maintained trade relationships with their counterparts around Lake Valencia, separated by Cordillera de la Costa and by a distance of over 200 km in straight line (as the 'crow flies'). Both *Tivela* and *Donax* might have also been collected and exported to the VLB from their natural habitats in the area of Morrocoy, on the western frontier of the Valencioid Sphere of Interaction.

Further evidence indicates that the VLB people valued marine shells much more for their aesthetic and, probably, symbolic qualities than utilitarian ones. In part, the symbolic connotations the marine shells had for the Valencioid people might have been linked to the Underworld and the dead. The value of marine shells as mortuary offerings is strongly accentuated thorough all cultural sequences of human occupation of the VLB. The Dos Mosquises dead was disposed surrounded by the *botuto* shells that might have been considered as burial offerings. However, both on the mainland and on Dos Mosquises Island the molluscs were not exclusively associated with funerary contexts. Personal adornos made of shell were found in non-burial grounds. Social use of marine molluscs by the Valencioid people is hampered by the scarcity of contextual data. The distinction between higher status and lower status shell artefacts, for instance, may be clarified by future research. The data from DM site suggest that activities linked to rough shellwork, i.e. preparation of preforms, might have been spatially differentiated from fine shellwork activity areas. This spatial/functional differentiation may be a reflection of specialisation and social status of site occupants; some areas and tasks ascribed to commoners while other, secluded loci destined for skilled specialists and representatives of the elite.

Archaeological excavations in the VLB indicated that for both Barrancoid (from a.d. 200) and Valencioid (from a.d. 800-900) inhabitants of the VLB, the *Strombus gigas* shell was the most coveted raw material for manufacture of adornos. It may be speculated that the material and spiritual values attached to marine shells by the late prehistoric inhabitants of the VLB might have been inherited from the former Archaic and/or Barrancoid inhabitants of this area. However, the value of *botuto* lays not in its shell alone. Its meat is, even today, a highly coveted food in the Caribbean markets. The Valencioid people exploited quantities of *Strombus gigas* molluscs for clearly culinary purposes, in the insular environments. Whether some of this meat reached or not the VLB cannot be documented from the archaeological record alone. However, the search for the indirect indicators of such an influx should be attempted in future research.

Evidence seems to indicate that the quantity, variability and complexity of shellwork in the VLB reached its climax during the Valencioid period (a.d. 900-1500). According to Kidder (1944: 82) Valencioid deposits in the La Cabrera site retained the main types of beads from the deeper (Barrancoid) layers; however, cut-shell pendants and carved beads started to appear in Valencioid deposits. Whole shells, instead, were much more frequent in Barrancoid than in Valencioid deposits. Berry (1939: 558), emphasised that the *botuto* shells were prevalent at La Cabrera and that the abundance of shell artefacts was particularly visible in Valencioid deposits. It seems probable that the Barrancoid people used/valued whole shells more than the Valencioids; as far as worked shells are concerned the evidence suggests an inverse relation. May the lack of manufactured *botuto* shells and/or preforms observed in the 'pre-Valencioid' deposit in the DM site be positively related to the evidence of the Barrancoid emphasis on whole shells?

Knowing from the analysed insular data that the late prehistoric/protohistoric Valencioids were involved in staged manufacture of *Strombus gigas* preforms (lips, discs), a question arises: Who were the receptors of these objects on the mainland? The evidence of shellwork reported from the central western coastal bays (Puerto Maya, Chuao, Cata, Cepe) are, almost exclusively, limited to production of specialised tool kits including gorges, fishhooks, cutters/scrapers and axes. All these tools are related to exploitation and procurement of marine resources. Personal adornos made in shell are almost absent from these coastal sites. In general, the quantity and variability of worked shell artefacts is considerably lower on the coast than in the VLB sites. Lithic microdrills for boring holes in the shells during the bead making process (see Yerkes 1993) might be expected in workshops if such were, in fact, localised in the coast. However, such tools were not reported from the coastal sites (Martín 1995). It seems that the artisans responsible for the bead-making and manufacture of finely carved shell pendants, recovered from the VLB burials, were residing not on the coast but on the Lake Valencia shores. These evidence seems to suggest that the middlemen settled on the coast might have been trading the shells and preforms obtained on the same coast and on the islands, toward the VLB societies. However, were the coastal Valencioids real middlemen who benefited themselves from the trade of the marine shells? The fact that the coastal Valencioids did use shells for the manufacture of quite elaborate fishing utensils, but not for adornos and ceremonial items, as well that they did not retain in their settlements the preforms nor whole exotic shells may suggest that these societies were not totally independent segments of the Valencia Basin Valencioid societies. It rather seems to indicate their ceremonial and social dependence on the VLB societies. However, it may also be the case that these societies were not involved in the insular enterprises.

Moving the attention from the central-western bays to the central coast I found that the only candidates for the voyages to the Los Roques islands were the societies linked to the El Topo cultural tradition (Valencioid series). These groups might have been moving seasonally toward the coast from their permanent settlements in the mountains and undertaking the insular voyages in search for *botuto* shells and meat. After the conclusion of a given voyage, the majority of its participants could retreat toward the mountains where shells as well as, probably, the meat were redistributed, consumed and/or traded further inland. How does this hypothesis articulate with the ethnohistoric data? Before the final discussion on the nature and dynamics of the hypothetical socio-economic articulations between the Amerindian populations from the VLB, coast and islands is attempted, I should analyse other non-ceramic data from the insular sites.

Fishes

In this section I will discuss the taxonomy and intra-site spatial distribution of fish remains within the DM site. The frequencies of occurrence of archaeological taxa are compared to the catches of the contemporary local small-scale fishery in order to assess whether this might allow insight into the fishing methods used by the Valencioid islanders. Even though there is still disagreement over sampling methods and analytical and interpretative procedures of fish remains in archaeological sites, the archaeological, ethnohistoric, ethnographic and bioecological data are intertwined in many of the modern studies (see Coutts 1975; Colley 1983, 1987, 1990; Keegan 1986; Crabtree 1990; Cooke 1992; Owen and Merrick 1994a, 1994b). Fisheries do not depend on skill and gear alone, but also on a wide range of environmental and ecological variables (see Davenport 1960; Cordell 1978; 1974; Keegan 1986). Such natural factors as climate, sea level and sea bottom morphology in Los Roques Archipelago (and in the whole Caribbean) may be considered relatively constant during the last 1000 years (see Keegan 1986). In consequence, the data on traditional small-scale fishing carried out in Los Roques Archipelago, may, with relative confidence, be used as a tool to guide the inferences on prehistoric fisheries.

Specialised fishing is a job for experienced fishermen. In studying fisheries of the Valencioid islanders I am particularly interested in assessing whether they may be considered as intense and specialised or as opportunistic, generalised practices, bearing in mind that fishes had to 'compete' for their position in the diet with such a rival as *Strombus gigas* mollusc. If the Valencioid islanders were interested in fish for delayed consumption (preservation/trade) then certain fishing devices might have been used to capture those fish which are more suitable/desirable for salting, drying or smoking. If instead (rather than fish) *Strombus gigas* meat was dried for delayed consumption in large quantities, then fishing might have been a complementary practice oriented to capture a broad spectrum of inshore species by using simple devices, with less degree of effort and risk.

It should be remembered that in interpreting the statistical figures and the absence/presence of fish remains in DM, I do not necessarily reveal the particular fishing strategy of any single Valencioid society. Rather, I attempt to assess whether the archaeological data have a potential to indicate which fishing methods may have been used preferentially during the whole time span of the occupation of Dos Mosquises Island by a culturally homogeneous, but possibly socially heterogeneous, segments of the Valencioid societies.

Finally, it should be emphasised that for the identification of all archaeological specimens I created a comparative collection composed of modern specimens captured within a range of less than one kilometre from Dos Mosquises Island.

The sample

A total of 32,732 fish remains were recovered from the DM site. The most numerous remains were vertebrae (68%) followed by otoliths (22%), mandibular fragments (2.6%) and spines (2.1%). The taxa of 30% (N=8170) of all remains were identified. Over 91% (N=22,269) of unidentified remains are vertebrae (Table 46). Under the label of 'various bones' in the Table 46 are hidden predominantly diverse head bones, except for the mandibular fragments, teeth and parasphenoids. Only about 0.07% (N=18) of otoliths and 0.01% (N=4) of mandibular fragments were not identified.

The striking gap between 7177 (otoliths) and 849 (mandibular fragments) seems to be indicative of the operation of strong diagenetic processes. This difference may also indicate that heads of fishes were carefully stripped of meat during the consumption and certain bones were crushed; practices that strongly affect the survival of bones. At the same time, the quantitative similarity between left and right otoliths and mandibles within the particular trenches, points

TABLE 46. ***Distribution of identified and unidentified fish remains (NISP) between trenches in the DM site.***

Remain	Trench A	Trench B	Trench C	Trench D	Trench E	Trench F*	Total
			Identified remains				
Otoliths	31	5473	1672	0	1	0	7177
Mandibles	25	746	72	0	7	0	850
Teeth	0	90	0	0	0	0	90
Bony spines	0	17	0	0	0	0	17
Carapace plaques	0	13	0	0	0	0	13
Tail spines	1	7	0	0	0	0	8
Tail thorns	0	0	3	0	0	0	3
Subtotal	57	6346	1747	0	8	0	8158
			Unidentified remains				
Vertebrae	101	19,428	2450	10	192	88	22,269
Various bones	44	1255	234	1	2	18	1554
Spines	39	454	140	2	18	37	690
Scales	0	25	2	0	0	0	27
Otoliths	0	12	5	1	0	0	18
Teeth	0	13	0	0	0	0	13
Mandibular	0	2	2	0	0	0	4
Subtotal	184	21,176	2833	14	212	143	24,562
Total	241	27,548	4579	14	220	143	32,745

toward patterned disintegration of certain bones. This also indicates that the remains were not greatly reordered spatially during the postdepositional period, and therefore that the deposits, especially that of Trench B, are primary. Some of the absent fish head elements might have been subtracted from the site by the hermit crabs, lizards and/or the birds, especially representatives of the family Laridae (Antczak 1991: 506). I am also well aware of the possibility that unknown quantities of certain taxa might have been processed and cured outside the site and/or taken out of the island without any material evidence of such a practice within the site's boundary.

The remains are unevenly distributed among the trenches (Table 46). 27,535 (84%) of them were found in Trench B, followed by Trench C (14%). The remains from Trench F are not analysed, given the superficial character of this deposit and the high probability of admixture between prehispanic and modern food remains. The remains do not exhibit carnivore modifications, butchering marks or other cultural modifications, apart from two drilled shark teeth. Only a few remains were burned, indicating that the fishes might have been sporadically roasted directly over a fire, but that they were mainly boiled in soups and stews, smoked and/or consumed raw.

Fishing tools

The remains of fishing tools are extremely sparse in DM. A total of 12 uni- and bipoints made out of mammal bones, one of them barbed and another perforated in its proximal end, are the only artefacts that may be related to fishing (Table 62; Figures 48-50). Eight of them (66.6%) come from Trench B and two each from Trenches A and C. The existence of manufactured fishhooks in DM is dubious; three bent tubular objects made out of *botuto* shell were interpreted as fragments of possible fishhooks, nose-rings or earrings. However, even if manufactured fishhooks are absent, countless unworked splinters of *botuto* shell might have been used as gorges and would pass unrecognised in the archaeological record. Other artefacts possibly related to fishing are modified shells of *Cypraea* spp. that might have been used as net sinkers. The absence of remains of traps or nets in the archaeological record may, however, not be indicative of their absence in the systemic context. These implements were usually made of perishable materials that rarely survive in archaeological deposits. Given the overall scarcity of fishing tools in DM the evidence of their use should be inferred indirectly.

Ichthyoarchaeofauna vs. the present day catches

It may be argued that diverse fishing practices might have been employed in the various reoccupations of the site, and the evidence of their use intermingled in the archaeological deposit. Therefore, it may be argued, comparison between the composition of modern catches and archaeological sample is a futile exercise. It is futile indeed when the composition of archaeological remains is considered as a direct reflection of the prehistoric human behaviour and a single catch composition, and when the comparisons are restricted to the mechanistic procedure of imposing the modern sample onto the ichthyoarchaeological one. This method may be evaluated only after an assessment of its heuristic efficacy for the particular case study. I claim that these analyses may be of utility in delimiting a range of possible fishing methods used in prehistory when these incorporate the data on (1) taphonomy; (2) all fish and non-fish marine fauna represented in the archaeological sample; (3) the fauna that is not represented but, as is known, can be captured by a given fishing method; (4) the variability in animal behaviour and size; (5) opinions of experienced local fishermen and; (6) the fish remains that may be found with certain frequency washed ashore or within the natural soil matrix. The conclusions derived from such comparisons must, however, remain tentative.

Fish remains may be absent in the archaeological sample because (1) they were absent in the systemic context, (2) decayed or were subtracted during the postdepositional period or (3) were not recovered. Certain locally available fishes might have not been captured because of inadequacy of fishing gears/skills, toxicity, taboo or because they were taken beyond the occupational area for delayed consumption. It is well known by the Los Roques fishermen that *Harengula humeralis* (*Sardina manzanillera*), a species that can be captured in abundance by a pocket seine net, is highly toxic in certain periods of the year and may cause the death of mammals, including humans (Rocha 1991; Cervigón 1966, vol.1: 124; 1980: 209; Sociedad 1956). The consumption of this fish is strictly avoided. When fished it is quickly identified and thrown away at sea to avoid ingestion by humans and domestic animals (cats, dogs, etc.). There can be little doubt that the mortal toxicity of this fish was known by every Amerindian visitor to the Los Roques islands. Such information must have been passed from generation to generation, and from one society to another.

Of lower value and, therefore, smaller impact on the archaeological sample, might have been the information about the possibility of *ciguatera* poisoning (ichthyosarcotoxism) linked to the ingestion of some reef and reef-associated fishes of the families Serranidae, Lutjanidae, Carangidae or Sphyraenidae, in particular the species *Sphyraena barracuda*; the effects of *ciguatera* poisoning are usually not mortal for humans (Randall 1961). The fish become toxic by eating dinoflagellates, a benthic micro-organism that grows on macro-algae, and this effect is biomagnified through the food chain, the large predators becoming the most toxic (de Sylva 1994: 945, 948). There is no seasonal variation in the occurrence of *ciguatera* toxicity; however, after tropical cyclones the reported cases are significantly more numerous (de Sylva 1994: 951).

None of the fish that are reported as ciguatoxic are discarded from the catch or dish by the Los Roques fishermen. On the contrary, I was told that such highly valuable species as *Aetobatus narinari* (Myliobatidae) are consumed completely, even if the fishermen feels unwell after the consumption of a portion of it, suspecting that it may contain *ciguatera* poison (Teobaldo Salazar information 1985). The same may be said about the representatives of the family Ostraciidae, considered as a delicacy by Los Roques fishermen, even though consumption may also be harmful for humans (Randall 1968: 273). Hamblin (1984: 43) argued that the marginal presence of the Sphyraenidae, Serranidae and Lutjanidae remains in the prehistoric samples from Cozumel Island may suggest that the Cozumel Maya did not capture them to avoid the *ciguatera* poisoning. This, however, is certainly not a reason for the archaeological underrepresentation of these taxa if judged from the perspective of the contemporary data from the Los Roques Archipelago.

Some fish, such as stingrays (Myliobatidae, Dasyatidae) and sharks (mainly Carcharhinidae), are highly valued food resources for the Los Roques fishermen. The tailspine of the stingray is feared. It is cut off of the tail as soon as possible and discarded; the wounds caused by these spines are painful and sometimes have serious results such as the loss of a leg or arm (Bigelow and Schroeder 1953: 461). Both rays and sharks are relatively large specimens butchered on the seashore; the non-edible parts are thrown into the sea, the flesh is taken to the campsite or salted and put in the sun to dry. Even if taken wholly into the site, the cartilaginous skeletons of these fishes survive poorly in archaeological deposits, except for tailspines and mandibles (rays), calcified vertebrae and dermal denticles (rays and sharks) and teeth (sharks). The remains from DM show that rays and sharks were captured for food as well as for non-subsistence purposes. Apart from tailspines and teeth some mandibular fragments of a large (over 200 kg) *Aetobatus narinari* specimen(s) and calcified shark vertebrae were identified in the Trench B assemblage.

It has been suggested that stingrays were 'probably not captured for food, but were used by the Maya as implements in ceremonial scarifications and bloodlettings - to pierce the tongue, nose, ears, and to mutilate the penis' (Hamblin 1984: 31; 1985). I consider that there are no reasons to believe that stingrays were pursued for their tailspines only, and their valuable meat was discarded, unless a prehistoric alimentary taboo on stingrays can be demonstrated.

Like the prehistoric Maya (Borhegyi 1961: Moholy-Nagy 1985; Hamblin 1984; 1985), the *Cumanagoto* (Coastal Caribs) from the eastern Venezuelan coast used ray tailspines in bloodletting practices as well as arrow points for terrestrial hunting (Civrieux 1980: 210). The association of stingray spines and shark teeth (both perforated and/or unperforated) was widely reported from caches, burials or offerings in prehistoric Mesoamerica (Borhegyi 1961; Moholy-Nagy 1985; Hamblin 1984; 1985). However, both tailspines and teeth might have also been used as projectile points, awls, or implements used in woodcarvings, respectively (see Wing 1977). Two teeth, one of them perforated, of *Isurus oxyrinchus* were recovered in Trench B. Other perforated teeth of Carcharhinidae was also found in the same trench.

The *Isurus oxyrinchus* or *mako* is well known for its fierceness and resistance to capture, being one of the most active and strongest swimming sharks (Bigelow and Schroeder 1948: 128-9). The presence of its teeth in the DM assemblage may not necessarily be a testimony of fishing skills and technological capacity of the DM occupants. This near-surface pelagic swimmer, which in the West Atlantic may measure over three meters in length and weigh over 450 kg, is hardly ever captured in near-shore fishery in Los Roques Archipelago (Peñaherrera 1991). Could this shark be captured with fishing devices used by the DM site occupants? The Trench B accumulated as much as 87.5% (N=7) of tailspines and all the shark teeth recovered at DM (Table 46). Were these items used by the Valencioid islanders for similar non-subsistence purposes as by the *Cumanagoto* and prehistoric Mesoamericans?

Hamblin (1984: 42; 1985: 169) considered the presence of a significant percentage of fish skull elements in her sample as an indicator of the absence of fish-drying practices in Cozumel Island. The Los Roques fishermen do not cut fish into chunks or fillets when processing it for drying. The exceptions are made for Carcharhinidae, Dasyatidae and Myliobatidae. All other fishes are dried with heads. The whole fish is cut lengthwise, but not completely, so that each dried piece equals a whole individual fish. In this way those who buy the dried fish may recognise what species are they paying for. To dry fish without the head is a bizarre idea for Los Roques fishermen since the head is an integral part of a fish and is usually eaten with special delight. It is considered that it gives the flavour to the fish soup. The heads of Albulidae are highly valued for fish soup while their flesh, with many tiny spines, is scorned. Instead, the heads of Balistidae are, as far as I know, among the few which are not eaten. It is considered that when ingested they may produce headaches and nausea

TABLE 47. *The abundance of fish remains by families (NISP and MNI) in Trenches A-C and E, in the DM site, in descending numeric order of total MNI.*

Taxa	Trench A		Trench B		Trench C		Trench E		Total	
	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI	NISP	MNI
Haemulidae	43	13	4743	2019	1479	667	4	1	6269	2700
Albulidae	4	2	467	196	99	51	0	0	570	249
Lutjanidae	0	0	265	87	68	32	0	0	333	119
Serranidae	0	0	282	63	78	38	0	0	360	101
Scaridae	9	3	229	56	14	4	3	1	255	64
Sparidae	0	0	113	21	1	1	0	0	114	22
Holocentridae	0	0	36	20	1	1	0	0	37	21
Sphyraenidae	0	0	59	12	3	1	0	0	62	13
Dasyatidae	1	1	7	7	3	1	0	0	11	9
Acanthuridae	0	0	10	5	0	0	0	0	10	5
Gerreidae	0	0	10	5	0	0	0	0	10	5
Carcharhinidae	0	0	43	4	0	0	0	0	43	4
Scombridae	0	0	5	4	0	0	0	0	5	4
Carangidae	0	0	6	3	0	0	0	0	6	3
Labridae	0	0	5	3	0	0	0	0	5	3
Diodontidae	0	0	32	1	0	0	1	1	33	2
Isuridae	0	0	2	1	0	0	0	0	2	1
Myliobatidae	0	0	19	1	0	0	0	0	19	1
Ostraciidae	0	0	13	1	0	0	0	0	13	1
Total	57	19	6346	2509	1746	796	8	3	8157	3327

while the rest of the carcass is highly appreciated. Even so, these heads are rarely cut off and discarded before consumption. If the Amerindians from DM were drying whole fish as the modern fishermen do, then the routes of the dry fish may be archaeologically traceable on the continental coast and inland.

Such small specimens as Engraulidae, Gerreidae and Clupeidae, that may be easily captured by pocket seine nets in huge numbers, might have been ingested whole (a common present-day practice), and therefore their tiny remains (otoliths) could be found in human coprolites. Lizards, hermit crabs and birds may also be responsible for absence of certain remains. According to a series of experiments I carried out on Dos Mosquises Island in 1988, the Laridae birds may be responsible for the disappearance of all small fragments and even of whole small and medium sized fishes (i.e. Haemulidae, Labridae, Sparidae) regardless of whether they are fresh or cooked. The bird usually takes a piece to the sea where it is consumed (Antczak 1991).

Regarding the size of the individual fishes represented in the DM sample (Table 47), it was suggested (Fernando Cervigón, personal communication 1989-90) that the mandibular remains of Lutjanidae and Serranidae pertained to large and small specimens, with medium-sized individuals being underrepresented. These data suggest that at least two different fishing methods/implements had been used to catch these taxa. The mandibular fragments of Serranidae family belonged mainly to the genera *Epinephelus* and *Mycteroperca.*

The mandibular remains of Haemulidae are almost exclusively of very large specimens (F. Cervigón, personal communication 1989-90). This seems to indicate that diagenetic processes together with human erased the small mandibles from the archaeological record behaviour (smaller

TABLE 48. ***Relative frequency of fish taxa (in percents of total sample/catch) in the archaeological sample from Trench B, DM site, and modern Los Roques Archipelago fisheries with diverse fishing gears.***

Taxa	Archaeofauna	Gill net[1] (1)	Gill net[2] (2)	Pocket seine[3] (1)	Pocket seine[4] (2)	Trammel[5]	Trap[6] (1)	Trap[7] (2)
Haemulidae	80.47	21.63	5.06	43.80	47.30	59.30	45.31	33.01
Albulidae	7.81	35.28	16.19	8.84	0.10	16.40	0.06	0
Lutjanidae	3.46	5.31	14.75	0.80	1.30	2.52	8.28	9.51
Serranidae	2.51	0.35	0.88	0	0	0.31	6.50	5.97
Scaridae	2.23	3.36	7.04	2.10	2.80	0	11.77	18.66
Sparidae	0.83	1.77	3.74	0	0	0.31	7.52	16.00
Holocentridae	0.79	2.30	0.88	4.90	0.80	0.31	3.62	0.18
Sphyraenidae	0.47	0.53	0.44	0.70	0.20	0	0	0.33
Dasyatidae	0.27	12.58	13.44	0	0	0	0	0
Acanthuridae	0.19	0.35	0	3.80	0.10	0	6.29	4.53
Gerreidae	0.19	0	0.22	8.60	0.70	0.63	1.64	0.51
Carcharhinidae	0.15	2.48	12.99	0	0	0	0	0
Scombridae	0.15	0	0	0	0	0	0	0
Carangidae	0.11	7.26	17.95	0	0.30	7.52	0.95	0.07
Labridae	0.11	0.53	0.77	0.40	14.60	0	0.75	1.18
Diodontidae	0.003	1.24	0.11	0	0	0	0.54	0.18
Isuridae	0.003	0	0	0	0	0	0	0
Myliobatidae	0.003	0.53	0.88	0	0	0	0	0
Ostraciidae	0.003	0	0.44	0	0	0	1.43	4.13
Mullidae	0	0	0	0.50	1.40	10.40	0.27	1.88
Balistidae	0	0.35	0.11	0	0	0	0.54	1.51
Chaetodontidae	0	1.41	1.54	0	0	0	3.42	1.62
Muraenidae	0	0	0	0	0	0	0.47	0.36
Scorpaenidae	0	0	0	0	0	0	0.47	0.14
Priacanthidae	0	0	0	0	0	0	0	0.03
Bothidae	0	0	0	0	0	0	0	0.03
Orectolobidae	0	0	0.44	0	0	0	0	0.03
Monacanthidae	0	0	0	0	0	0	0	0.03
Sphiraenidae	0	0	0	0	0	0.94	0	0
Clupeidae	0	0	0	14.40	17.80	0.94	0	0
Pomacentridae	0	0	0	0	1.70	0.31	0	0
Belonidae	0	0	0	6.20	5.00	0	0	0
Engraulidae	0	0	0	3.90	0	0	0	0
Pomacantidae	0	0	0	0.80	0	0	0	0
Synodidae	0	0	0	0.30	0	0	0	0
Kyphosidae	0	0.35	0.77	0	0.10	0	0	0
Rhinobatidae	0	0.35	0	0	0	0	0	0
Echeneidae	0	0.17	0	0	0	0	0	0

The data compiled and adapted from:[1] Posada et al. 1988; [2] Alcalá n.d.; [3] Pulido 1983; [4] Villamizar n.d.; [5] Pulido 1983; [6] Posada n.d.; [7] González n.d.

mandibles might have been crushed and damaged during consumption). However, the archaeological otoliths of Haemulidae are highly uniform in size, representing medium sized and large individuals, suggesting that small specimens had not been captured or that they were ingested whole.

The majority of mandibular fragments of Scaridae are of large specimens of *Scarus guacamaia*, being mostly the remains of *Scarus coelestinus*, with *Scarus coeruleus* present only marginally. Large *Scarus guacamaia* individuals are abundant in Dos Mosquises waters and may easily be captured by pocket seine, bow and arrow or spear. The mandibular fragments of *Sphyraena barracuda* pertained to large individuals that might have been speared; however small mandibles are also present. The fragments of mandible of *Aetobatus narinari* suggest that one or more large (over 200 kilograms in weight) individuals (Fernando Cervigón, personal communication 1989) were captured in nets or speared. The carcasses of *Diodon hystrix* (Diodontidae) and several members of the family Ostraciidae (especially trunkfishes), in diverse stages of decomposition, may be found with certain frequency washed ashore on the southern shores of Dos Mosquises Island.

Nets

The Amerindian use of different types of nets was amply documented by the ethnohistoric sources in the Caribbean (see Lovén 1935: 430; Wing and Reitz 1982: 24-5), including the north-eastern Venezuelan Coastal Caribs (López de Gómara 1979[1552]: 123; Caulín 1966[1779] vol. 1: 145; Ruíz Blanco 1965[1690]:10; Civrieux 1980: 165; see also Wilbert 1955). Unless fibres, sinkers, or floats or nets impressions (i.e. on clay) are discovered in the archaeological record, the use of nets can only be inferred indirectly. Amerindian nets were made of perishable materials such as fibre, wood, gourd squash or wooden floats, and shell or stone sinkers. The sinkers, when unmodified, may not be recognised in the archaeological record (Wing and Brown 1979: 25; Wheeler and Jones 1989: 170). In 1991 I observed unmodified, naturally rounded coral stones wrapped in pieces of net and attached as sinkers to a large trammel net, near a temporary ranch on Cayo Sal Island. Identical net sinkers were observed in the Caribbean by Michael de Cuneo, Columbus's companion, and were described in a letter written in 1495 (Antczak 1991: 505).

Only 17.3% of Los Roques traditional fishermen use nets (Posada 1989), a situation that may be expected within the coral reef domain. The data extracted from modern marine biological studies on fisheries with the trammel (*trasmallo*), gill nets (*tren*) and pocket or sleeve seines (*chinchorro* or *jábega*) in Los Roques Archipelago, are discussed here (for details on Spanish/English terminology of fishing gears used here see Foster 1960: 77-86).

The trammel

The trammel consists of three separate nets superimposed one on the other, anchored and maintained in a vertical position with floats and sinkers. Table 48 shows the relative abundance of taxa captured with a trammel used on the sea-grass beds to the east of Dos Mosquises Island, in 36 samplings carried out during one year (Pulido 1983). The aim of this sample was to capture the fishes that migrate daily, induced by the light intensity, between coral reef and the sea-grass beds (Pulido 1983; see Randall 1965).

The most abundant captured taxa were Haemulidae and Albulidae, matching perfectly the order of the first items of the ichthyoarchaeological list. However, if the trammel was used by Valencioids then the Mullidae, Carangidae and Clupeidae should also have had been captured. Their absence in the archaeological sample may be explained by the practice of consumption of entire specimens (Clupeidae, Mullidae), decay or recovery bias. The Mullidae are members of mixed schools of Pomadasyidae, Labridae and Holocentridae (Munro 1983: 148) and, therefore, their remains should be present in the archaeological sample. However, both Clupeidae and juvenile Mugilidae might have not been captured if the mesh of the trammel was too large. It is more difficult to assess whether the Carangidae were fished or not. The otoliths of these robust fishes are very thin and fragile; they might have been fragmented before and after deposition, and escaped the recovery. However, the mandibles of Carangidae are almost absent in the archaeological sample. It is possible that they are more perishable than the mandibles of other fishes. Cervigón (personal communication 1990) suggested that 18 spines (16 of them from Trench B) with hyperostosis are probably of Carangidae, which may additionally indicate that these fishes were captured by the occupants of the DM site.

In conclusion, if trammels were used by the Valencioids, then the Dasyatidae, Myliobatidae, Carcharhinidae and Sphyraenidae were captured by means of other fishing implements. Except for these fishes, a trammel located on Dos Mosquises Island sea-grass bottoms, at a depth less than five metres, can yield, according to local fishermen, the catch characterised by taxonomic relative abundance very similar to the archaeological sample (Antczak 1991: 509).

Gill nets

The next example comes from catches with surface gill nets in different areas of Los Roques Archipelago, effected during a two year period (Posada et al. 1988). These nets are flat and rectangular, composed of a series of sections fastened end to end and equipped with floats; the bottom gill nets are equipped with sinkers. The detailed quantification of the catches was not provided. However, it was reported that the most common were Dasyatidae, Carcharhinidae, Lutjanidae, Albulidae, Carangidae and Haemulidae, respectively (Posada 1989: 222). Except for the Albulidae, Haemulidae and Lutjanidae, the archaeological sample contains few remains of the rest of the mentioned taxa. However, as already stated, the Carcharhinidae and Dasyatidae are almost invariably butchered on the beach by the modern fishermen. The meat of these fishes is rarely eaten fresh because of its strong smell and taste. It is usually dried and sent outside the islands. I consider that if the Valencioid people were interested in obtaining fish for delayed consumption, then the above taxa would have been the most coveted. Some Carcharhinidae had undoubtedly been eaten at DM since a few vertebrae of these fishes were identified in the archaeological sample.

Two bottom gill net samplings were carried out between 1987-9 in the western part (Posada 1989) and between 1989-90 in various localities in Los Roques Archipelago (Alcalá n.d.). The catches of the first sample were dominated by Haemulidae and Albulidae with high yields of Dasyatidae, Carangidae and Carcharhinidae (Table 48, 'gill net 1'). The second sample was dominated by Carangidae, Albulidae, Lutjanidae, Dasyatidae and Carcharhinidae, respectively (75.32% of a total catch); the Haemulidae represented only 4.73% of the total catch (Alcalá n.d.

[Table 48 'gill net 2']). The low relative abundance of Haemulidae in the last sample is indicative of differences in catch with the bottom gill net that may vary depending on the natural factors (bottom type) and mesh size. Many long term samplings in various localities with the same implement are needed to gather a reliable data base regarding average catch composition.

It can be said that the surface gill net in present day Los Roques Archipelago is designed to capture members of the families Carcharhinidae and Myliobatidae, while the bottom ones catch rays (Dasyatidae) and lobsters Panulirulidae (Posada 1989). Both types of nets also catch turtles. Turtle remains are relatively numerous in the DM site; however, these animals may also be captured using several different techniques. The bottom gill nets also capture valuable edible crabs such as *Calappa* spp. and *Mitrax spinosissimus* as well as sea stars (mainly *Oreaster reticulatus* [Posada 1989; n.d.]). The abundant modern catches of lobsters and edible crabs contrast with the scarcity of their archaeological counterparts. On the other hand it was demonstrated that these group of nets are implements designed to capture larger fishes appreciated for drying. Might the Myliobatidae, Dasyatidae and Carangidae have not been perceived as suitable items for delayed consumption and therefore not pursued with gill nets? Were the lobsters and edible crabs captured but not consumed? These data seem rather to suggest that these types of net were not used by the Dos Mosquises Valencioids.

My observations on modern Los Roques gill netting do not confirm the supposition that large numbers of particular species in a limited size range may indicate the use of fixed gill nets. The taxonomy and size of the catch with the same gill net may vary greatly from one area to another. It also changes in function of moon phase, type of bottom, distance from the reef and shore, spawning seasons and other migratory movements. I agree with Owen and Merrick (1994a: 14) that traps would also harvest large schools of the same species. In addition, the large pocket seine nets may also capture schooling fishes uniform in size.

The pocket seine

The pocket seine net consists of three main sections: two long wings and a pocket in the centre where the fish are trapped. The net is rigged with heavy ropes that run along the two edges of each wing, the upper having attached floats and the lower sinkers. The very large seines have to be operated by dozens of persons with the use of boats and divers; small ones may be handled from the beach by two or even one man.

The results of the three samplings with a pocket seine are discussed here. The first was carried out using a seine of one centimetre mesh that was deployed in a sea-grass bottom, on the south coast of Dos Mosquises Island. The sampling was accompanied by a visual census and was carried out during the day and the night. The Haemulidae dominated the sample and were seen in abundance during the night, while Albulidae and Clupeidae were captured and seen during the day only (Pulido 1983: 28-3). The average figures of the capture shown in Table 48 ('pocket seine 1') match quite closely the order of the items on the archaeological list. The absence of Sparidae, Serranidae, Carcharhinidae and Dasyatidae in modern sampling should be emphasised.

The result of the second sampling confirmed some of the anterior data. Urreiztieta (1985: 124-126) analysed all specimens of *Haemulon sciurus* captured by pocket seine in the same area. She observed that the specimens over 200 mm in length adopt the pattern of crepuscular migration and feed only at night, while smaller individuals feed during the day. This pattern is invariable during the year. Could this indicate that the medium sized and large Haemulidae from the archaeological sample were captured during the night?

The third sampling was carried out in Gran Roque Island during one year (Villamizar n.d.). The Haemulidae and Clupeidae dominated the sample; the Albulidae represented 0.1% only (Table 48 'pocket seine 2'). It is possible that the scarcity of Albulidae in these samples is due to the fact that fishing was carried out during the night while, as already mentioned, Pulido (1983: 28) observed and captured Albulidae during the day only. This is another example of the great variability of catches while the same fishing device is in use.

The pocket seine of a reduced size and fine mesh is, according to local fishermen (Pablo Mata, Felipe Salazar, Teobaldo Salazar, JoseAna Marval, Luis Marcano), the most simple, efficient and least risky fishing device that, on one hand, may account for almost all of the archaeological fauna and, on the other hand, may capture huge quantities of valuable small school-fishes such as Clupeidae and Engraulidae, whose remains are unlikely to be preserved or recovered from the archaeological record. By observing the congregations of feeding *Pelecanus occidentalis* and *Sula* spp., the Amerindians could select the locations with major concentrations and capture large volumes of these small fishes without use of a boat and with little effort, risk and uncertainty. In 1989 I observed Luis Marcano operating by himself a pocket seine from the beach on the south-western part of Dos Mosquises Island, catching several specimens of *Scarus guacamaia* between six and nine kilograms each, among other fauna (Antczak 1991: 512). In general, the small pocket seine used in Dos Mosquises yields large volume of diverse, but mainly small, taxa and juveniles. If the Amerindians were interested in larger specimens of fish (such as Carcharhinidae, Dasyatidae, Carangidae, Scombridae or Serranidae) for delayed consumption, then they did not use this device since it does not capture them.

Traps

The trap is a typical implement used by Caribbean fishermen to capture benthonic fishes from rocky and coral bottoms (Anonyme 1776). For Venezuela traps were reported for proto-historic

Arahuacos from the coast of Paria (Fernández Oviedo y Valdés 1962) and the Amerindian groups of Orinoco (Gilij 1965[1782] vol.2: 264). They are still used by the Añú [Paraujano] (Wilbert 1983: 22) and Warao (Arellano 1986: 761) Indians. In Los Roques Archipelago traps (*nasas*), made totally out of natural materials, were still in use in the 1950s (Méndez and Martín 1956: 229, 231). Due to their perishability, the indirect evidence for prehistoric use of traps should be searched for in the composition of archaeoichthyological assemblages (Wing and Reitz 1982: 26; Keegan 1986).

About 40% of Los Roques fishermen use fish traps (Posada 1989: 82), mainly to capture members of the families Panulirulidae, Serranidae and Lutjanidae. The results of three trap samplings carried out in the surroundings of the Dos Mosquises Island are discussed here. Among the commercial taxa yielded by the first sampling, carried out during 17 months between 1982 and 1983, Haemulidae, Serranidae, Lutjanidae, and Carangidae dominated (Cervigón et al. 1983). The second sampling was dominated by Haemulidae, Scaridae, Sparidae and Lutjanidae (González 1987 [Table 48 'trap 1']). The third study was carried out between 1986-7 and Haemulidae, Scaridae, Sparidae and Lutjanidae dominated the sample (Table 48 'trap 2' [Posada et al. 1988]). Additionally, lobsters, edible (*Mitrax spinosissimus*, *Carpillius coralinus*, *Callinectes* spp., and *Calappa spp.*), and non-edible or of lesser food value crabs (*Stenocionops furcata*, *Dromia erythropus* and Paguridae), as well as sea urchins, octopus, sea stars, sea cucumbers and molluscs (including *Strombus gigas*), are regularly captured with traps in Los Roques Archipelago (Cobo de Barany 1970; Hauschild and Weil 1983; Grajal and Laughlin 1984; Ramos 1986; González 1987; Posada et. al 1988; Posada 1989). The remains of these fauna are very scarce or absent from archaeological record. The modern data clearly indicate that Albulidae can be very rarely captured by traps. They, however, are the second most numerous taxa of the archaeological sample. Can we therefore discard consideration of the trap as a fishing implement of the DM Valencioids?

It has been suggested that the great uniformity of fish size in the archaeological sample may be indicative of use of fish traps (Wing and Reitz 1982; Keegan 1986). The present day Los Roques fishermen use traps to catch lobsters, but also large reef carnivores such as Serranidae and Lutjanidae and pelagic but reef-associated species (i.e. Carangidae). If the entrance of the fish trap is large enough to permit the access of these large fishes then the range of taxa of different sizes within the trap is considerable. It would be regulated by the size of the openings in the walls of the trap, which permit (or restrict) the escape of the smaller fishes. The composition of the catch and the variability in sizes may vary, depending not only on the environmental conditions but also on the time during which the trap lay on the sea bottom without being emptied. If a trap is not checked for more than a day then endocannibalism and natural mortality may greatly reorder the original composition of the fish that entered the trap. For example, the large carnivores may be overrepresented in relation to herbivorous and smaller fishes. In this situation neither the uniformity

TABLE 49. *Distribution of identified and unidentified fish remains (NISP) in CS/D and OR/F sites.*

	CS/D	OR/F	Total
		Identified remains	
Otoliths	216	17	233
Mandibles	2	142	144
Bony spines	1	0	1
Jaws	1	0	0
Tail spines	0	1	1
Subtotal	220	160	379
		Unidentified remains	
Vertebrae	642	312	954
Scales	0	12	12
Spines	37	29	66
Jaws	2	0	0
Various bones	101	75	176
Subtotal	782	428	1208
Total	1002	588	1587

in size nor the abundance in the archaeological sample of remains of herbivorous fishes can be used as indicative of the use of trap (Wing and Reitz 1982).

Nets or traps?

The above analyses seem to suggest that trammel and/or pocket seine nets, and occasionally bow and arrow and/or spear, were used by the Dos Mosquises Valencioids. The use of traps and gill nets has been called in question. These conclusions are strongly confirmed by the experience I gained through more than three years of living among the Los Roques fishermen. However, inferences drawn from these comparative analyses are hampered by the difficulty in determining which natural and/or cultural processes could account for presence/absence of certain taxa. For example, (1) it cannot be determined whether the scarcity of Carcharhinidae, Myliobatidae, Dasyatidae and Carangidae in the archaeological record is a result of their low capture or of spatial differentiation of activities related to their processing, consumption and/or drying. (2) On the other hand, the absence of Clupeidae and scarcity of Engraulidae and Gerreidae in the archaeological record may be explained by the practice of ingestion of whole individual fishes or by their discard from the catch because of their similarity to the toxic *Harengula humeralis.* Furthermore, these fishes may not have been fished at all.

Let us compare the logistic implications of the use of nets vs. traps. The traps might have been constructed on the islands with natural elements from the islands (wood) and others brought from the mainland (fibres). It seems improbable that voluminous traps would have been transported in a canoe. However, if they were in use, then when the site was abandoned they might have been taken to the mainland or left on the islands. From a strictly cost-effective point of view, none of these possibilities is really efficient, especially when compared to the nets that could be easily transported between islands and mainland.

Contexts

It seems probable that, in terms of quantity, fish were unevenly consumed from one area to another within DM. The sequences of taxonomic abundance and quantities of identified and unidentified fish remains are almost identical between Trenches B and C (Tables 47). This suggests that these samples are the results of similar sets of cultural and natural processes. Whether two human groups were consuming fish in both areas during the same period of site occupation, or the location of these activities varied through time, cannot be answered. What can be said is that similar fishes in similar relative quantities were consumed in both areas, indicating that human groups from both areas had equal access to this food resource. Furthermore, these data also suggest that they were using similar fishing methods as well as similar ways of fish processing and consumption. Finally, this may indirectly confirm the already proposed cultural unity of the deposits from Trenches B and C.

The remains in Trench C were more densely distributed near the hearth areas and relatively sparse in the proximity of human burial. It may be expected that fish were consumed in Trench C, within the same loci where *botuto* shells were heavily worked and where large extensions of hearths were found. If this area was dedicated to fish processing/consumption it may reinforce the inference that the *botuto* meat was also consumed within this area.

The taxonomic diversity and quantity of fish remains were considerably higher in Trench B than in C (Table 47). The area of 20 m^2 (or 33.8% of total extension of this trench) located toward the eastern border yielded nearly 60% (N=16,473) of all fish remains recovered from this trench. The density in this area reached 4118 remains (NISP) per cubic meter of archaeological deposit sieved with 1 mm^2 mesh. The central part of the trench was relatively poor in fish remains; the stingray tailspines and shark teeth were found there. The other taxa were evenly distributed between the eastern and western sides of trench. The eastern part of Trench B yielded low quantities of *botuto* and other shell remains, and one small hearth was located in its north-eastern corner (Figure 35). Toward the east of the trench is an area almost free from *botuto* shells. Was this *botuto*-free area dedicated to consumption, and/or was it rather the after-consumption dumping area? I will return to this question after the analyses of the spatial distribution of other faunal remains within Trench B.

Fish remains in other insular Valencioid sites

The densities of fish remains in Valencioid sites CS/D and OR̂/F are considerably lower than in DM (Tables 49, 50 and 51). Six and nine fish families were identified in assemblages from CS/D

TABLE 50. ***The taxonomic abundance of fish remains (MNI) in CS/D and OR/F sites.***

Taxa	CS/D		OR/F	
	MNI	%	MNI	%
Albulidae	12	14.8	6	8.8
Carangidae	0	0	1	1.4
Dasyatidae	0	0	1	1.4
Diodontidae	1	1.2	0	0
Haemulidae	62	76.5	2	2.9
Istiophoridae	1	1.2	0	0
Lutjanidae	4	4.9	1	1.4
Myliobatidae	0	0	1	1.4
Scaridae	1	1.2	53	77.9
Serranidae	0	0	2	2.9
Sphyraenidae	0	0	1	1.4
Total	81	100	68	99.5

and OR/F, representing 32% and 47% of DM taxa respectively. No reliable inferences can be build on the basis on the comparative analyses of fish remains between these sites, because these might have been exposed to different diagenetic processes in each of these sites (see Jones 1990: 144). Especially, the remains from CS/D that lies in a hypersaline area, had undoubtedly suffered high rates of decay. On the other hand the sample from OR/F is biased by the larger (8 mm^2) mesh than that used to sieve in other sites. Finally, the excavated volumes of archaeological deposits from CS/D and OR/F were considerably smaller than that of the DM site, which might result in lower taxonomic diversity.

It should, however, be emphasised that despite the diagenetic and recovery biases, the sample from CS/D is dominated by Haemulidae and Albulidae like that from DM. These may suggest that the Valencioid people from CS/D and DM were using the same fishing implements and shared similar patterns of fish processing/consumption.

The most outstanding objects in the fish remains assemblage from CS/D are the remains of Istiophoridae. One long sword-like upper jaw of *Tetrapturus albidus* (white marlin [see FAO 1978, vol.3]) with marks of cutting on its proximal end was found toward the western border of the trench (Table 51). This object was lying in close association to two spear point-like objects that are probably made out of upper jaws of the same fish, five landshells (*Plekocheilus* and *Strophocheilus*), two articulated turtle vertebrae, one human clay figurine and five medium sized cooking pots. The two spear point-like objects from this context, as well as other three similar specimens recovered within the radius of 1.5 meter, are roughly worked on all their sides and seem to be made out of upper jaws of white marlins (Table 51). Such objects were not recovered from any other insular site. Whether the Istiophoridae were captured in Los Roques Islands or brought to the site from the continental coast cannot, thus far, be answered.

The white marlin, whose large upper jaw was found, may have been over 1.5 m in length, the others were smaller individuals (Fernando Cervigón, personal information 1990). White marlins are

TABLE 51. *Identified fish remains from the OR/F and CS/D sites.*

Taxon	Skeletal element	Anatomic position/physical integrity	NISP/Level 0-20	NISP/Level 20-40	NISP Total	MNI
		Los Mangles (OR/F)				
Albula vulpes	Otolith	right (whole)	0	6	6	
Albula vulpes	Otolith	left (whole)	2	4	6	6
Albula vulpes	Otolith	right (upper fragment)	0	0	0	
Haemulidae	Otolith	left (whole)	2	0	2	2
Haemulidae	Otolith	right (whole)	0	1	1	
Scaridae	Dentary	left	5	4	9	
Scaridae	Dentary	right	2	8	10	
Scaridae	Dentary	fragment	0	6	6	
Scaridae	Pharyngeal teeth	superior	16	32	48	48
Scaridae	Pharyngeal teeth	inferior	4	8	12	
Scaridae	Premaxillary	left	6	4	10	
Scaridae	Premaxillary	right	9	2	11	
Scaridae	Dentary or premaxillary	fragment	11	7	18	
Scaridae	Otolith	right	0	1	1	
Scarus guacamaya	Dentary	left	1	4	5	5
Scarus guacamaya	Pharyngeal teeth	inferior	0	1	1	
Aetobatus nari nari	Dentary	(fragments)	0	2	2	1
Carangidae	Dentary	left	1	0	1	1
Dasyatidae	Tail spine	-	0	1	1	1
Lutjanidae	Dentary	left	1	0	1	1
Lutjanidae	Dentary	right	0	1	1	
Lutjanidae	Otolith	right (whole)	0	1	1	
Lutjanidae	Premaxillary	right	0	1	1	
Serranidae	Dentary	left	0	1	1	
Serranidae	Premaxillary	left	2	0	2	2
Serranidae	Premaxillary	fragment	1	0	1	
Sphyraena barracuda	Premaxillary	left (fragments)	1	1	2	1
Total			64	96	160	68
		Cayo Sal (CS/D)				
Albula vulpes	Otolith	left (whole)	0	9	9	
Albula vulpes	Otolith	right (whole)	0	12	12	12
Diodon hystrix	Bony spine	-	0	1	1	1
Haemulidae	Otolith	left (whole)	0	62	62	62
Haemulidae	Otolith	right (whole)	0	39	39	
Haemulidae	Otolith	right (upper fragment)	0	22	22	
Haemulidae	Otolith	right (lower fragment)	0	31	31	
Haemulidae	Otolith	left (upper fragment)	0	17	17	
Haemulidae	Otolith	left (lower fragment)	0	18	18	
Lutjanidae	Otolith	right (whole)	0	2	2	
Lutjanidae	Otolith	left (whole)	0	4	4	4
Lutjanidae	Dentary	left	0	1	1	
Scaridae	Pharyngeal teeth	superior	0	1	1	1
Tetrapturus albidus	Jaw	Upper	0	1	1	1
	Jaw?	Upper?	0	2	2	?
Total			0	222	222	81

typical representatives of pelagic oceanic environment (García de los Salmones 1989: 1). They migrate to the south Caribbean to feed between July and October and afterwards migrate to the Greater Antilles for breeding (Mather et al. 1975; García de los Salmones et al. 1988: 2). It was suggested that in the recent past large schools of white marlin, accompanied by humpback whales and frigate birds, were passing by the north central Venezuelan coast (Jaen and Jaen 1994: 29-30). The most important fishing spot for this species is the '*Placer de La Guaira*', located 20 km north from La Guaira port on the central Venezuelan coast (Gaertner et al. 1988: 4). In this area the

Amerindian fishermen could capture white marlins with long surface drifting gill nets, using live bait either drifting or slow trolling or trot line (*palangre* [see García de los Salmones 1989: 42; Jaen and Jaen 1994: 21]). These fish are strong, difficult to catch, fighters (Jaen and Jaen 1994:11). If the remains of white marlin from CS/D are not trade items but, in fact, come from fishes captured by the Valencioid fishermen, then they are testimony of the highest skills in open sea fishing attained by these prehistoric people. These data contrast with the 'prudent' inshore use of trammel and/or pocket seine nets suggested by the DM fish remains and the rest of CS/D remains. Both DM and CS/D sites are located on the border of the Archipelago and their occupants had unrestricted access to both inner lagoon waters and the open sea pelagic domain. It may be suggested that, once on the islands, the Valencioids concentrated on the exploitation of those resources that were absent on the mainland coast, such as the *botuto*. Therefore, they were not practising open sea fishing from the islands since these provided valuable resources that might have been, in part, the reason for the insular voyages. However, from this juncture the information about the Valencioid fishing tool kit and skills should be sought on the continental coast where the insular Valencioids were coming from.

Between islands and mainland

Gorges and barbs of composite fishhooks made out of shell and bone, mammal bone harpoon points as well as lithic net sinkers were found in two the Valencioid coastal sites of Playa Chuao and Puerto Maya (Morales 1984; Alvarez and Casella 1983; Martín 1995: 227). These data are material evidence of angling, spearing and netting practices. From ethnohistoric data we know that the coastal *Caraca* Indians manufactured certain fibres that were especially durable in salt water (Pimentel 1964[1578]: 128-129). Unidentified crab and fish remains were abundant in all stratigraphic sequences of the Playa Chuao site (Morales 1984; Martín 1995: 192). In this site were also found two primary flexed human burials associated with sea-related objects (Morales 1984; Martín 1995). The grave offering of the first direct burial of an adult consisted of one globular bead and a pebble of quartz, a valve of *Arca zebra*, three fragments of long mammal bones and one stingray tailspine (Morales 1984; Martín 1995: 172-3). The second burial, a neonate, was placed in a globular *olla* and associated with fish remains (Morales 1984; Martín 1995: 173). In the Puerto Maya site remains of such representatives of coastal pelagic and oceanic waters as Carcharhinidae, Scombridae and Carangidae as well as Scaridae were recovered (Alvarez and Casella 1983).

On the central Venezuelan coast the continental platform is very narrow; in fact in Puerto Maya, the sea reaches a depth of 120 metres only a few meters from the shore (Alvarez and Casella 1983). Therefore, there are no geomorphologic nor ecologic conditions that would stimulate the coevolution of communities of sea-grass and coral reefs of significant extension. In consequence the traditional fishery in Los Roques Archipelago exploits sea-grass bottoms/reefs habitats while the central coast fishery is mainly oriented to capture pelagic species (Hilders López 1972).

Studies of the present day small-scale fishery on the central coast (comprising the region between Paraguaná and Boca de Uchire) indicate that traps (*nasas*), pocket seine nets, trot lines (*palangres*), hook and line, gill nets and/or trammels are used (Salaya et al. 1985; Hilders López 1972). According to Salaya et al. (1985: 42) the open sea that begins almost immediately from the shore constrains the effectiveness of the inshore gill netting. The costs and risks of their use are also considerable. When used, the gill nets serve to capture Carcharhinidae, Sphyraenidae, Carangidae, Scombridae and Lutjanidae (Salaya et al. 1985).

The pocket seine nets are operated in bays, mainly seasonally. Two species captured with these nets are: *Mugil liza* which migrates in large schools in front of the coast between January and April, and *Caranx hippos* migrating between July and August (Salaya et al. 1985; Hilders López 1972: 28). The fishermen from the north-eastern coast used to communicate by means of smoke between the coast and inshore islands (Islas del Píritu [Civrieux 1980: 220]). Men are located on the Cordillera de la Costa tops observing the movement of fish schools and sending the pertinent information by the means of smoke. During the period of school movements the fishermen leave all other activities and concentrate on capture of the schools of fishes that penetrate into the bays. The whole village participates in these activities and the harvest is divided between them. Even at the present day a school that passes in front of Ocumare de La Costa may reach a total weight of over 120 tons (Salaya et al. 1985: 70).

The traps along these coasts capture benthonic fishes, mainly Lutjanidae, Serranidae and Pomadasyidae, as well as crabs and lobsters (Salaya et al. 1985). The fact that trapping is presently the most popular fishing technique on the Central coast cannot be indicative of its popularity in the prehistoric fisheries. The lobsters, snappers and groupers, captured with traps, are definitely more valued catches on modern markets than rays or sharks, captured by gill nets. The use of motorboats and synthetic materials allows traps to be put at the depth of dozens of meters; these depths might have not been easily reached by prehistoric fishermen. Additionally, different social and ideological factors probably guided the prehistoric fishermen in comparison to their modern counterparts (see Colley 1983).

The above data suggest that operation of pocket seine nets, trapping, angling and to lesser degree gill netting might have been well known fishing practices for the prehistoric inhabitants of these coast. Additionally they might have been experienced in capturing large schools of fishes. The remains of Carcharhinidae, Scombridae and Carangidae from the Puerto Maya site may suggest also that gill nets were used. However, more ichthyoarchaeological data from coastal sites are required to follow these analyses.

Moving inland from the coast to the Valencia Basin, the data on fish remains are extremely scarce. In the Tocorón mound Osgood found bone hooks in the form of gorges and small barbed points that may have been used for fishing (Osgood 1943: 49; Pl.15, A and C). Fish remains are mentioned in Osgood's (1943: 50) and Berry's (1939: 566) reports; however they were not identified. In Berry's report from La Cabrera, no mention is made of fish remains from the Valencia Phase layers (about 1 m below the surface); however, in deposits of the La Cabrera Phase (between 2.4 and 3 meters below the surface) he mentioned 'pockets of ashes and clay full of fish bones' (Berry 1939: 561). These data may suggest that the La Cabrera Barrancoids depended on fishing, in contrast to their Valencioid successors. It may be expected that this was a lacustrine fishing. However, whether these remains are an admixture of lacustrine and marine fishes or not, cannot be determined on data thus far available.

Bennett (1937: 137) mentioned points, barbs and fishhooks from La Mata mound. Kidder (1944: 41, 49,51) found in Los Tamarindos fish vertebrae in four urn burials, both single and multiple, that he interpreted as funeral furniture (food offerings). Fish bones, all unidentified, were a very common find in his excavations (Kidder 1944: 76). Requena (1932: 269) found in Los Cerritos mounds one urn with a human skeleton accompanied by shells 'helicidos' (*caracoles*) and by a small olla with fish bones and a small feline mandible. He stated that finds of urns with small receptacles with animal remains including fishes (that he interpreted as offerings for post-mortem voyage), were common (Requena 1932: 272). The association of marine shells, fish remains and feline mandible may be meaningfully linked to the DM contextual association of the same elements; however, the insular specimens were not directly associated to any human burial. The association of fish remains (including stingray tailspines) and marine shells with burials is a striking feature of mainland Valencioid funerary practices. It may be expected that, apart from ceremonial significance, the marine fish might have played symbolic roles in Valencioid societies.

The insular data seem to indicate that Valencioid islanders did not concentrate on any category of fish but made widespread use of species from the inshore habitats (coral reefs and sea-grass bottoms). However, certain insular data, as well as the remains of archaeological fishing tools from the coast indicate that the coastal Valencioids were skilful open sea fishermen. If the Valencioid islanders limited their practices to 'prudent' generalised inshore fishery then it may suggest that fish was not the main resource they were searching for on the islands. Knowing that on the coast they could catch large quantities of Dasyatidae and Carcharhinidae, I suggest that they, generally, did not use gill nets during their stay in Los Roques Archipelago. Instead they used trammels and/or small pocket seine nets, bow and arrow, spear and, possibly, gorges. Their attention might have been focused on the exploitation of *Strombus gigas* and other resources for delayed consumption which are unavailable on the coast, while large numbers of small and medium sized fishes were probably consumed *in situ* daily.

From Pimentel's account we know that those *Caraca* groups who lived inland were travelling to the central coast to exchange 'comestible things' for salt and fish (Pimentel 1964[1578]: 119). On the other hand, he did not mention fish among the resources targeted on the islands. This may strengthen the hypothesis that the fish for delayed consumption were mainly obtained in inshore/offshore fishery on the mainland.

Finally, it is noteworthy that strong fishing territoriality was documented by 16th century chroniclers among the Coastal Caribs from eastern Venezuelan Coast. The violation of territories of hunting or fishing were common motives for war among the *Palenque* from Unare (Civrieux 1980: 173). Castellanos (1962[1589]: 66) recorded the episode of war between the chiefs *Guaramental* and *Orocopon* as a result of the quarrel for fishing areas. It may be suggested that the insular fishing areas may have been divided among several Valencioid groups or societies and protected from others. This, however, cannot for now be demonstrated.

Sea turtles

Five out of seven species of the world's marine turtle are found in the Venezuelan Caribbean (Hendrickson 1980: 600). The green turtle (*Chelonia mydas mydas*), that reproduces in almost all Venezuelan islands and some continental beaches, is most valued for food (Buitrago 1987: 147). Its preferred habitats are coral reefs with abundant grasses and algae (Rebel 1974: 46; Pritchard 1967). The habit of laying eggs on beaches adjacent to feeding spots (Carr 1980: 490; Hendrickson 1980: 603; see also Table 52) makes this species especially vulnerable to human exploitation and has pushed it to the border of extinction (Weil and Laughlin 1983; Antczak and Antczak 1987c; 1988d).

The hawksbill turtle (*Eretmochelys imbricata*) also reproduces on the Venezuelan coasts and islands; its largest nesting colonies have been reported from Los Roques Archipelago (Buitrago 1980; 1987: 148). The translucent plaques of carapace (upper shell) of this turtle have traditionally been used to produce diverse decorative artefacts and utensils. The loggerhead (*Caretta caretta*) is the third species of turtle whose nesting has been reported from Los Roques Archipelago (Buitrago 1987: 148).

The ridley turtle (*Lepidochelys olivacea* [Eschscholtz]) reproduces on continental coasts (Hendrickson 1980: 606). It is relatively common in eastern Venezuela, but very rarely visits the Los Roques islands (Buitrago 1987: 48; Hedelvy and Vernet 1992: 94; Teobaldo Salazar, personal communication 1983). The leatherback turtle (*Dermochelys coriacea*) has pelagic habits and is relatively scarce in Venezuelan waters. It occasionally reproduces in eastern Venezuela and in Los Roques Archipelago. The flesh of this species is rarely eaten; however, from both the flesh and soft

TABLE 52. *Some characteristics of marine turtle reproductive biology.**

Species	Average duration of nesting (hours)	Type of nesting	Number of eggs laid by one female per year	Interval of nesting (years)	Time of nesting	Reproductive peak in Los Roques Archipelago
Chelonia mydas	2.5	Groupal	130.0	3	Night	June-October
Eretmochelys imbricata	1.6	Solitary and groupal	175.0	3	Day and night	May-December
Caretta caretta	1.8	Groupal	246.0	2	Night	April-July
Dermochelys coriacea	1.5	Groupal	91.8	2	Night	-
Lepidochelys olivacea	1.0	Large groups	156.2	2	Night	-

* Compiled from Buitrago 1987: 141, Table 1; Hirth 1980: 521, Table 7; Weil 1984; Hedelvy and Vernet 1992: 95.

carapace is extracted the oil (the oil of the luth) that has traditionally been used for medicinal purposes and for waterproofing boats (Rebel 1974: 30). This is the largest species and may reach a weight of more than 600 kg.

The lack of carnivore predators, the existence of long sandy beaches for nesting, and abundant the food supply provide ideal natural conditions for marine turtle life and reproduction in the Los Roques Archipelago. The archipelago has a total of ca. 240 km of coast. 28 km are divided between 32 sandy beaches on 25 islands that are favourable for turtle nesting (Buitrago 1987: 140). Seven out of the 12 best turtle beaches, including Dos Mosquises Island, are located in the western, four in central and only one in the eastern part of the Archipelago (Hedelvy and Vernet 1992: 94, Table 2).

Since 1972 the capture of turtle has been prohibited in Los Roques Archipelago. However, immediately before this date over 50,000 kg of turtle meat, mainly from *Eretmochelys imbricata*, was obtained in this area yearly (Buitrago 1980).

The sample

As in the majority of prehistoric sites in the Caribbean (see Wing and Reitz 1982), the remains of marine turtle are among the most numerous vertebrate remains on the off-shore Venezuelan islands. Almost all Valencioid sites contained fragments of turtle bones and carapaces and in such sites as DM, CS/D, CA/A, GR/A and CS/C they were relatively abundant.

A total of 949 turtle remains were recovered from the DM site; 843 (89%) skeletal elements were identified, not one below the family level (Table 53). Over 77% (N=654) of identified elements are upper shell (carapace) fragments. Almost all parts of the turtle skeleton are represented, although in uneven quantities, indicating the operation of cultural and/or natural processes. It is striking that 88% of all turtle head remains (all six cranial and two out of three mandibular fragments found in DM) were recovered from Trench A, which is located on the beach ridge. The mandibular fragments are anterior parts of mandibles (dentary) of adult individuals. The deposition of the majority of head remains on the beach may indicate that the animals were butchered on the seashore. These remains were not associated spatially to clusters of artefacts found in Trench A. They lay among, and were

TABLE 53. *Marine turtle remains (Chelonidae) from Trenches A-F, DM site.* *

Skeletal element	Trench A 0-20	Trench A 0-40	Subt.	Trench B 20-40	Trench C 20-40	Trench D 20-40	Trench E 20-40	Trench F 0-20	Total NISP	Total %
Identified skeletal elements										
Carapace (fragment)	119	28	147	189	192	29	48	49	654	77.5
Vertebrae	36	0	36	22	1	0	6	2	67	7.9
Humerus	27	1	28	10	6	0	1	0	45	5.3
Phalanx (fragment)	15	0	15	4	0	0	0	0	19	2.2
Femur	12	0	12	2	2	0	2	1	19	2.2
Scapula	3	0	3	2	2	0	0	0	7	0.8
Cranial (fragment)	6	0	6	0	0	0	0	0	6	0.7
Coracoid	3	0	3	2	1	0	0	0	6	0.7
Fibula	3	0	3	2	1	0	0	0	6	0.7
Ulna	4	0	4	1	0	0	0	0	5	0.6
Mandibular (fragment)	2	0	2	0	1	0	0	0	3	0.3
Tibia	1	0	1	2	0	0	0	0	3	0.3
Isquion	1	0	1	0	1	0	0	0	2	0.2
Pubis	1	0	1	0	0	0	0	0	1	0.1
Subtotal	233	29	262	236	207	29	57	52	843	99.4
Unidentified skeletal elements										
Long bone UID (fragment)	14	0	14	9	1	2	5	2	33	31.1
Tarsal carpal or phalanx (fragment)	3	0	3	2	0	3	2	3	13	12.2
UID	17	0	17	10	15	0	12	6	60	56.6
Subtotal	34	0	34	21	16	5	19	11	106	99.9
Total	267	29	296	257	223	33	77	63	949	

* Skeletal element identification by Alfredo Paolillo O. Fundación Venezolana para la Conservación de la Biodiversidad Biológica BIOMA, Caracas. UID - unidentified skeletal element.

functionally related to, food debris composed of *botuto* shells, fish bones and fragments of other turtle bones and carapaces.

The presence of the head remains at DM indicates that not all turtle heads were cut-off and discarded off-site, as may be suggested by ethnographic data and evidence from other sites in the Caribbean (i.e. Hamblin 1984: 63). Head bones were also found in CS/D Valencioid site as well as in Ocumaroid site, in Domusky Norte Island.

Only one vertebra was heat-darkened, indicating that the DM turtles were not roasted in shells directly over a fire or hot coals. No turtle bones had been carnivore-chewed or rodent-gnawed. Eight humerii and one femur have cut marks resulting from flesh separation. Whether shell (*Codakia* shell), bone or stone cutting tools were employed in butchering was not determined.

In OR/F and OR/H sites, on La Orchila Island, turtle remains were also relatively abundant. There, a relatively higher number of remains were heat affected, suggesting that meat might have been roasted within carapaces directly over the fire.

Turtle capturing: where and how?

The nesting females were especially vulnerable targets. The Insular Caribs simply turned the animal upside down with the aid of a wooden stick (Lovén 1935: 423; Alcedo 1988[1786-89]: 278).

Additionally, the majority of species arrive for nesting in groups, so that many animals can be caught in one night (Table 52). Once captured, the turtles may immediately be slaughtered or kept alive for delayed consumption or transportation. The Amerindians from Cuba used to keep as many as 500 to 1000 turtles in marine corrals (Las Casas in Lovén 1935: 422). The terrestrial turtles from the mainland were also kept in corrals (Bellin 1986[1763]: 213; Lovén 1935) and/or transported in canoes with tied limbs (Gumilla 1988[1741]: 71). In 1980s I observed several turtles with tied extremities kept in the shade of mangrove for delayed consumption by the Los Roques fishermen. In four weeks these animals could lose as much as 20% of their weight (Rebel 1974: 96), but they still represent fresh meat 'in hand'.

Harpoons were also used by the Insular Caribs to fish turtles (Lovén 1935: 425). They were also used to pursue Orinoco turtles (Carvajal 1956[1647-48]: 230). The *Achagua* of the River Orinoco used bows and arrows for this purpose (Rivero 1956[1733]: 10). The early colonial sources did not leave data about the use of large nets to capture turtles by the Caribbean Amerindians (Wing and Reitz 1982: 25), but pertinent information comes from Cayenne, French Guyana, where nets 4.8-6.4 m wide and 80-100 m long, with openings of 30 cm^2, were used especially to capture turtles (Bellin 1986[1763]: 213). Columbus observed the Amerindians of Cuba fishing turtles with *remoras* (sucker fish [Lovén 1935: 425]). Finally, skilful swimmers could also catch turtles by hand (Alcedo 1988[1786-89]: 278; Gumilla 1963[1745]: 154). In 1988, I observed in Las Aves de Sotavento Archipelago, a group of fishermen who were shouting and pursuing a turtle with a boat toward the shallow water where it was captured by hand.

Until recently, the fishermen from Los Roques Archipelago were using gill and trammel nets and, occasionally, harpoons for turtle fishing. To attract turtles to the net, especially during full moon nights, some of the gill nets had roughly shaped turtle-like sculptures made out of wood attached to the extremities of the upper line (information from Teobaldo Salazar, 1983).

The subsistence risk involved in turtle fishing, especially when carried out on the beach, is extraordinarily low in comparison to sea fishing and terrestrial hunting. The technological and co-operative requirements are nil, and the reward is highly nutritive meat, grease and carapace (Nietschmann 1972: 59 [see Table 54]).

Were the DM turtles captured on the beach or pursued at sea? It is expected that when turtles are captured on the beach they will be mainly females. When captured in the sea and on the beach the remains of individuals from different sex/age categories should be found (Wing and Brown 1979). The sex of the turtle at the island sites could not be determined; however, some data about their sizes were obtained. All ulnae represent only medium to large-sized turtles. Sub-adult individuals are represented by one femur (5% of all femurs), three humerii (6.6%), and one carapace fragment (0.1%); the vertebrae pertained to individuals of all sizes except for neonates (Alfredo

Paolillo, personal communication 1989). Given that 22 turtles (MNI counted on the number of humerii divided by two) were identified at the DM site, only three (13.6%) of them were sub-adult specimens. One mandibular fragment of subadult turtle was found in CS/D. These data indicate that the majority of the turtles might have been captured on the beach, while some were also pursued at sea.

Did the Valencioids capture the nesting turtles during the night or did they prefer to catch them at sea, during daylight? It is noteworthy that the coastal Caribs (*Cumanagoto*) feared the darkness (Civrieux 1980: 185). The shaman was the only person who was capable of dealing with the spirits of the darkness in familiar, safe terms (Civrieux 1980: 185). Some sources affirm that a shaman is always present when 'his' people enter a new, unknown territory (Cruxent in Oliver 1989: 41). The shaman and his woman were present on board every *Warao* Indian canoe, on the traditional route between the Orinoco Delta and the Island of Trinidad (Wilbert 1974). Moreover, the shaman was a captain and the only person on board authorised to blow the trumpet shell to communicate between canoes during storm or at night or when approaching the settlements (Wilbert 1974: 32, 44). According to Wilbert, the shaman, as well as the shell trumpet, were intimately linked to maritime navigation as well as to the ritual that accompanied the construction of the canoe (see also Fox 1875: 408-9). If these data can be applied to the prehistoric insular context, then it seems highly probable that shamans were present in DM and/or other Valencioid campsites. The recovery of material evidence of the shaman's presence may indirectly strengthen indirectly the hypothetical predominant capture of female turtles.

Another piece of indirect evidence that would shed light on this issue may be obtained by determining whether or not the Valencioid presence on the islands matches the turtle nesting period. Pimentel stated that the voyages to the islands were undertaken in the time of *bonanza*, i.e. the period of weak winds between May and October, enabling or greatly facilitating navigation on the central coast (Nectario María 1979: 335). He adds that the difficult ports of this coast operated in August and September during the time of calm sea (Nectario María 1979: 351). The months of Pimentel's *bonanza* match quite closely those of the Los Roques turtle reproduction periods, shown in Table 52. This indicates that the insular visitors were probably camping on the islands at the time when the most common turtle species were laying eggs.

Flesh and carapace

The volume of meat obtained from marine turtle is relatively large. The green turtle may weigh as much as 275 kg and its flesh constitutes about 40% of its total weight (Rebel 1974: 97). The meat of one green turtle of 86-95 kg may weigh 40.8-45 kg (Nietschmann 1972: 48).

The contemporary Los Roques fishermen separate turtle flesh from bones, cut it into thin strips, salt and sun-dry, for delayed consumption. Dry turtle meat may be kept for more than two months (information obtained from fishermen José Ana Marval, Luis Marcano, Teobaldo Salazar, 1983-1985). When the meat is prepared for immediate consumption, the only parts that are discarded are the head, long bones (those which cannot fit in the cooking vessel), the upper carapace and certain intestines. The turtle's head is cut off, often while still on the boat, and discarded in the sea. The turtle's bite is considered dangerous, and painful, and large turtles are able to damage the edges of the boats with their hard, strong beaks (information obtained from Teobaldo Salazar, 1983). All other parts of a turtle's carcass, including the fat, are put into a large metal pot (*paila*), cooked with herbs and salt, and consumed for several days. Alternatively, a part of the fat may be boiled separately and converted into oil. All parts of *Dermochelys coriacea*, whose flesh is not eaten, are put in a large pot and cooked for oil, except for the head (information obtained from fisherman Teobaldo Salazar, 1983). At present, the fishermen use the oil for medicinal and cosmetic purposes. Regarding the Amerindian methods of turtle preparation for consumption Alcedo (1988[1786-89]: 228) mentioned that the meat was left all night with lemon juice and thereafter roasted directly over a fire or coals in the carapace.

The upper turtle carapaces were used as receptacles to deposit the mass of grated bitter manioc, as musical instruments used in ceremonies, and as seats by the Sáliva Indians of the Venezuelan Llanos (Morey and Morey 1980: 269, 278, 285). Carapaces were also mentioned among kitchen utensils of the *Achagua* Indians (Arellano 1986: 432).

Turtle oil

The social significance of the multiethnic Amerindian congregations involved in the capture of the Orinoco River *terecay* (*Podocnemis unifilis*) and especially *arrau* (*Podocnemis expansa*) turtles, and the economic value of the oil extracted from their eggs, were extensively described by missionaries and early visitors to that region (Gumilla 1988[1741]: 69-70; Bueno 1965[1788-1801]: 127; Humboldt 1956[1814-1825], vol. 3: 273; Chaffanjon 1986[1889]: 121-122; Morey and Morey 1980: 264-265). Gumilla (1988[1741]: 66) observed that the oil was used to 'rub the body twice a day all through the year and to sell it to the remote [Indian] groups'. According to Humboldt, the oil was mixed with red pigment (*onoto* [*Bixa orellana*]) and used in body painting (Humboldt 1956[1814-1825], vol. 3: 287). Joseph de Cisneros (1988[1764]: 241) related that the oil was used to make a kind of butter (*manteca*) that was traded to Indian groups located farther from the Orinoco, who 'rub [with it the] body in summer [dry season], mixing it with coloured dye called *barquiz* which is very fresh and resists the sun'. The colorant called *barquiz* by the Orinoco Indians has striking phonetic similitude to *bariquisa*, the name of a pigment made out of tree leaves and bark and

TABLE 54. *Comparison of nutritive properties of turtle meat, chicken and beef.**

Meat	Protein %	Fat %	Calories/100grms.
Beef sirloin	19.0	19.0	247
Chicken	21.0	2.0	109
Turtle	23.0	0.2	102

* taken from Weil and Laughlin 1983: 27-33.

used by the *Caraca* Indians to paint their bodies for feasts (Pimentel 1964[1578]: 121). The main colours used by the *Caraca* were black and red, and the painting covered the upper or lower parts or a whole body. According to Pimentel (1964[1578]: 121), the *Caraca*, like their counterparts from Orinoco, used to rub the body with certain kind of resin called *orcay ymara*, using it as a base for the painting. If resin was used instead of turtle oil by the *Caraca*, then one piece of resin found in DM (Trench A), might have been used for this purpose. However, given that, on the one hand, the physical-chemical characteristics of this resin were not determined and, on the other hand, that the turtle grease/oil were easily available at DM, I consider that the piece of resin was more probably used for ceremonial burning (ceramic burners were found at the site). Alternatively, it could be used to glue stone chips (teeth) in the wooden board of a bitter manioc grater (see Rostain 1997: 235).

The body painting applied on oil ointment had beneficial refreshing and sun-protecting effects, so critical in an insular environment. According to Lovén (1935: 49) the Island Caribs used body painting as protection against salt water and insects (see also Civrieux 1980: 138). This protection would have been especially desirable during the periods of heavy mosquito plague, that occur between October and December in Los Roques islands. Turtle oil was also used for cooking and to fuel lamps (Caulín 1966[1779]: 107; Morey and Morey 1980: 265).

There are no reliable methods to determine whether or not turtle oil processing was carried out in a prehistoric site. It may be expected that certain densities, types and spatial associations of turtle remains, hearths, tools used in butchery and vessels should be found. However, the archaeological record may vary drastically according to the scale of oil production, the social organisation of labour, and ritual practices that may have accompanied these activities. No conspicuous indication of large scale, distinctively specialised turtle oil processing activities was detected in DM nor in other Valencioid insular sites. However, the identification of turtle oil residues from cooking pots may shed light on this question.

The aphrodisiac eggs

Turtle eggs are appreciated all over the Caribbean (Rebel 1974: 98). The nests are easily located by following tracks left on the sand by the female. A total of 200 turtle nests were located between 1979 and 1983 in Los Roques Archipelago, those of *Eretmochelys imbricata* being the most frequent (77.1% [Hedelvy and Vernet 1992: 95, Table 3]). The turtle lays an average of 100 eggs three times a year, in intervals of two, three or four years (Carr 1980: 490). The green turtle return to the site close to the first nest after 12 to 13 days (Wood and Wood 1980: 503). It is noteworthy that the period of incubation in the islands is longer than on the coast, since short incubation is an adaptive defence against predators (Hirth 1980: 511). Therefore, there is a greater chance that the egg collector may locate them in edible condition on the islands than on the coast.

The eggs are eaten boiled or preserved by the contemporary Los Roques fishermen. After a capture of a female turtle on the beach, some eggs found in its interior are with shell, others, without shell, are contained inside the tripe (*in bala*). These unshelled eggs are carefully extracted and put in a pot with salted water (*salmuera*), for 2-3 hours. Meanwhile the tripe is washed and cleaned. Thereafter the eggs are put back inside the tripe whose extremities are tied up and the whole thing is hung in moderate sunlight for 5-7 days. Such *morcilla* may be consumed several months later (information obtained from Felipe Salazar, José Ana Marval and Teobaldo Salazar 1983-1986). Gumilla (1988[1741]: 71) described a somewhat similar process, by which the Orinoco Indians used to dry terrestrial turtle eggs for delayed consumption.

According to Carr (1973: 145, 235), the nutritive value of both turtle flesh and eggs contributed to their reputation as an aphrodisiac all over the Caribbean. However, the eggs rather than the meat are considered an aphrodisiac by the Los Roques fishermen. Today they search frenetically for turtle eggs on all island beaches during the nesting season, dedicating to this activity an admirable quantity of time and energy.

According to fishermen, the meat of male and female turtles have a similar taste (information obtained from Teobaldo Salazar and Felipe Salazar 1983). The eggs, instead, once separated from the female body, are independent entities with specific form and taste. I speculate that they ideally may be conceived as symbolic fruits of the intercourse between the sea and the land, between the mystery of turtle conception (in the sea) and the tangibility of the new-born (on the land).

Could the popular contemporary beliefs about the aphrodisiac properties of turtle eggs be anchored in the Amerindian ideology? A similar question has been formulated about *botuto* flesh and both, thus far, cannot be answered.

Contextual considerations

Certain contextual associations shed light on turtle use by Valencioid islanders. In the first case, several ca. 2.5 cm thick patches of small fragments of carapaces were found at a depth of between 20 and 30 cm, in the northern part of Trench B, DM site. A large cluster of ceramic, lithic and bone artefacts lay immediately over these patches while some turtle bones were scattered among the artefacts. These data indicate that some artefacts were originally deposited in containers made of turtle carapaces and/or that the carapaces were discarded prior to artefact deposition.

Several fragments that belonged to one medium-sized carapace were found clustered in a test pit adjacent to the south-eastern border of Trench C, without any other associated remains. This carapace might have been discarded as food debris or served as a container. Regarding the turtle-shaped potsherd circles found in Trench C, neither the character nor spatial distribution of turtle remains shed light on their functional or possible symbolic meaning.

The analyses of contextual association permitted me to interpret one almost complete skull of a large specimen of *Chelonia mydas*, found in CS/D. The skull lay in the central part of the trench, surrounded by whole and broken medium-sized *ollas*, small open bowls with annular bases (a few of them decorated), as well as three deer bone flutes. Two human figurines, three shell beads, one *botuto* 'pearl', modified landshells, a fragment of polished petaloid stone axe, and three fragments of griddle, were found within a radius of 1.5 m from the centre of the cluster (Fig). The skull was complete, unlike the head fragments from other insular sites (DM, DMN), and not discarded in a refuse area, but located in the centre of a cluster of artefacts. Two mandibular fragments of turtle, one of them of subadult specimen, were found to the east and south of the trench, associated with food debris. These associations may suggest a special, possibly ritual, deposition of the skull. It should also be remembered that another group of artefacts, composed of modified beaks of white marlin (Istiophoridae), ceramic vessels, figurine and landshells, was found close to this cluster. It is probable that both the skull and the beaks, as well as the associated artefacts, were deposited as votive offerings.

The mainland data give some hints about the possible role of sea and/or land turtle in the ceremonial life of Valencioid people. These, however, do not come from the coast, where only a few unspecified turtle bones were found in one excavation unit, in Playa Chuao (Martín 1995: 193). In the Valencia Basin, remains of non-marine turtle were found in the La Cabrera site (Berry 1939: 566-568). Two ceramic turtle effigies are shown in Requena's book (1932: 53). One ceramic figurine standing on a canoe shows a head-dress whose shape and decoration clearly resemble a turtle carapace (Vellard 1938). Kidder (1944: 79) found a 'very realistic [turtle pendant], carved out of a thick piece of shell, probably *Strombus*', in a Valencioid deposit at La Cabrera. The iconic representation (turtle) and the raw material (*Strombus* shell) used to depict it combine symbolically these two target resources pursued by the Valencioids in Los Roques Archipelago; both the marine turtles and *botutos* are extremely rare animals on the Valencioid coast. Another similar, but eroded, turtle pendant found by Kidder was made out of *Spondylus* shell. It should be emphasised that one ceramic turtle effigy, stylistically related to its counterparts from the VLB, was found in Trench A, at the DM site.

In conclusion, I will argue that the turtle, like any other animal, is perceived by humans as more than a conglomerate of economically desirable constituents. They may also have been the depositories of symbolic meanings. They are creatures that inhabit the sea but, unlike many other marine animals, they may also be found on land. On land almost exclusively females are encountered. Replete with eggs these individuals emerge from the sea, where they were made pregnant, to give a new life on the land. The female turtle may be considered as a distinctive mediator between the maritime realm in which the life is engendered and the terrestrial environment where it comes to life.

The long night hours when the Amerindians were lying in wait for these large creatures emerging from the sea could be loaded with especially strong emotional tensions and fears. This would have led to rituals oriented toward the spirit-protectors of the animals, as well as to deities related to the binary opposite concepts of sea-fertility and land-life. It is, however, hazardous to conjecture if and how these archaeological data would have been integrated into the Amerindian ideology.

Archaeological correlates of ethnohistoric data

The marine turtles frequently nest on the beaches of the eastern Venezuelan coast and islands; however, for reasons that are unclear to marine biologists and ecologists, they very rarely nest on the central and western coasts (Buitrago 1987b: 150). Marine turtles were, therefore, an exotic resource on the Valencioid coast. Pimentel noted that:

> the aborigines [from the central coast] go there [to Los Roques, Las Aves and La Orchila islands] during the months of *bonanza* [fair weather] for salt and for the turtles to eat them and to extract oil from them (Pimentel 1964[1578]: 136).

Is this protohistoric turtle exploitation documented in the insular archaeological record? Can these data match the expectations raised by the Pimentel's account? A total MNI of 22 turtles (counting the number of humerii divided by two) were captured by the occupants of DM. This does not seem an impressive quantity when compared to more than 500 turtles which, despite the overexploitation and the prohibition imposed on fishing, are 'incidentally' captured in Los Roques Archipelago yearly (Hedelvy and Vernet 1992: 97). I expected that 500 years ago a reduced group of fishermen could catch 22 turtles in less than two weeks. If, according to Pimentel, the turtle was one of two target resources that motivated the Amerindians to cross 135 km of open sea, then the relatively low quantity of turtle remains recovered in the DM site does not match the expectations. How can we reconcile these issues?

Certainly, taphonomical and recovery biases could lower the number of turtle remains deposited originally at DM. An unknown quantity of turtles might have been butchered on the DM beach, the meat separated for drying and delayed consumption and bones discarded off-site and/or into the sea. Another unknown quantity of live turtles might have been brought to the mainland. Moreover, if some of the culturally undiagnostic archaeological sites in the Archipelago were in fact temporally and functionally related to the Valencioid site in Dos Mosquises Island, then some dozens of turtles might have been captured and processed at those sites. As a result, the exploitation of turtle may have been much more intense than is reflected by the excavated remains.

On the other hand, while re-reading the pertinent passage of Pimentel's narration I realised that he gives no direct indications about the quantity nor intensity of turtle exploitation carried out by the *Caraca*. He does not say whether the turtles were butchered and the oil extracted on the islands or on the coast. Furthermore, he never specifies whether turtles and salt were the only resources brought from the islands. If so, then it might be the case that these two products were in demand by the new Spanish community, which could impel the Amerindians toward such specialised expeditions. If, however, other resources were also brought to the coast why did Pimentel not mention the meat or shell of *botuto*, which like, turtles and salt, are also resources unavailable on the central coast? Is it possible that the *botutos* were not brought at all by the protohistoric *Caraca*?

For now, I more and more incline to the view that Pimentel was not referring to the Valencioids directly related to the Lake Valencia cultures and who left their cultural baggage in Dos Mosquises Island, but to small groups of *Caraca* Indians whose political economy was affected by the Conquest. However, to gain more data before further discussion of these issues I analyse, in the following sections, the mammal bones, lithic artefacts and miscellaneous remains from Valencioid insular sites.

Crustaceans and Echinoderms

The remains of four representatives of Crustacea and Echinodermata were recovered: lobsters, crabs, sea urchins and barnacles. The solid fragments of the exoskeletons of barnacles are well preserved in DM while only the hardest and thickest parts of crabs and lobster armour, such as claws and mandibles, survive (see Schäfer 1972). The preservation of these remains depend much on the nature of the carcass deposited (entire, burned, cooked, crushed, etc.). Apart from claws and mandibles, sparse small fragments of the cephalothorax were also found; however, due to the operation of preservational factors and, possibly, consumption practices, these thin carapaces are rare in archaeological sites of the region (see Hamblin 1984: 22).

Lobsters

Lobsters (mainly *Panulirus argus*) are one of the most important natural and economic resources of the Los Roques Archipelago; more than 98% of the Venezuelan lobster catch comes from this area (Cobo de Barany 1970; Cobo de Barany et al. 1975; Ginés et al. 1978; Hauschild and Weil 1983). They live on bottoms covered by sea grasses and corals in the interior of the archipelago. They are commonly fished by traps and nets, though skilful divers catch them by hand

(Hauschild and Laughlin 1985: 3). According to the ethnohistoric data lobsters were used as food by Insular Caribs (Breton in Lovén 1935: 423). The consumption of barbecued lobsters by the *Caraca* Indians was also mentioned (Hernández de Alba 1948: 476).

The part of the lobster's skeleton that may be preserved in the majority of marine environments without human intervention is the mandible (Schäfer 1972: 128). Even so, lobster remains are rarely reported from archaeological sites in the Americas (for positive examples see Hubbs and Roden 1964: 180; Carlson 1995).

A total of 18 mandibular fragments of lobsters, that account for nine individuals (MNI), were recovered in the DM site; 67% (N=6) of them come from Trench B (Table 55). This uneven spatial distribution may be a result of preservation bias. However, it may also suggest an asymmetrical access to this food. Alternatively, the lobsters may have had non-alimentary values and their presence related to certain non-subsistence activities concentrated in Trench B.

Two fragments are heat-affected, indicating that some of the lobsters may have been roasted directly in the hearth. Outside Dos Mosquises Island one mandibular fragment was found at Los Mangles site (OR/F), in La Orchila Island (Table 55).

How might the lobsters have been captured by the insular Valencioids? A single modern fish trap or *nasa* made of mangrove sticks and metallic wire, used by the Los Roques fishermen, can capture an average of 3.5 kg of lobster during one month (Hauschild and Laughlin 1985: 10; see also Ginés 1982). If the low frequency of lobster remains in DM site is not a result of preservation biases, but represents the animals captured intentionally, then they were neither captured with traps nor gill nets. Contemporary netting and trapping in Los Roques Archipelago yield substantial quantities of lobsters.

However, not only preservation biases may be responsible for lobster scarcity. We may think of the possible discard of these remains outside the campsite, of taboo imposed on their consumption, or of the restriction of their consumption for special purposes or for selected groups or members of the society. Lastly, most of the lobsters might have been exported to the mainland. My guess is that the scarcity of lobster remains is in part a result of postdepositional decay and, in part, it may suggest that the lobsters were captured only occasionally, since trapping, the most effective technique for their capture, was not employed by the Valencioid islanders. Additionally, the concentration of lobster remains in Trench B may point toward social inequality (i.e. differential consumption) and/or to their ceremonial character.

Crabs

Two species of coral reef crabs are of alimentary importance for the today's fishermen of Los Roques Archipelago: *Mitrax spinosissimus* and *Carpillius coralinus* (Grajal 1981; Ramos 1986;

TABLE 55. ***Distribution of Crustacean remains in Valencioid insular sites.****

	Trench A 0-20	Trench B 0-20	Trench B 20-40	Trench C 0-20	Trench C 20-40	Trench D 0-20	Trench D 20-40	Trench E 20-40	Trench F 0-20	CS/D 20-40	OR	Total
Grapsidae *Grapsus grapsus* Linnaeus, 1758**												
NISP	-	-	1	-	-	-	-	-	-	?	?	1
Brachyura												
NISP	79	33	102	57	111	11	27	14	-	37	45	516
Density	4.59	Tot.	45	Tot.	9.03	Tot.	15.8	Tot. 8.7	-	10.27	6.6	-
Panulirus argus												
NISP	-	-	12	-	5	-	-	1	-	-	1	19
Density	-		0.9		0.25	-	-	0.62	-	-	0.14	-
MNI	-	-	6	-	2	-	-	1	-	-	1	10
Density	0		0.46		0.1	0	0	0.62	0	0	0.14	-
Barnacles												
NISP	63	86	390	35	170	0	0	33	16	6	63	852
Density	3.66	Tot.	36.6	Tot.	10.4	-	-	20.6	40	1.66	9.3	-
Echinoderms												
NISP	-	-	31	-	-	-	-	-	-	2	2	35
Density	-		2.38	-	-	-	-	-	-	0.55	0.29	-
MNI	-	-	4	-	-	-	-	-	-	1?	1?	6?
Density	-		0.3	-	-	-	-	-	-	?	?	-

* Preliminary taxonomic identification of crabs by Gil I., E. J. and H. Suárez, 1996. Instituto Venezolano de Investigaciones Científicas (IVIC). Crustacean remains recovered in the cultural deposits sieved with 1 mm² mesh were used to calculate the density in DM and CS/D sites; in OR/F only 8 mm² mesh was used (see Table 10).

Posada n.d.). No remains of these species were recovered in the Valencioid insular sites. The representatives of Genera *Emerita* live in sandy beaches and are much less important as a food resource (Laughlin 1982: 13); their remains were not recovered. The third group of crabs, the hermit crabs (Paguridae) are captured sporadically and the fat contained in the abdomen is used for medicinal purposes.

The identification of crab remains from DM site is not yet concluded. Claw elements dominate the sample and the most common species represented seem to be *Cardisoma guanhumi* and Paguridae (Edgar Gil, personal communication 1998). Gil and Suárez (1996: 4) also identified remains of *Grapsus grapsus* in the sample from Trench B (Table 55). This is a common species in the area and may achieve a size of up to 44.2 mm (Rodríguez 1980). The remains show signs of having been exposed to fire, suggesting that the animal would have been roasted in an open fire.

Even if the final results of crab remain analyses are not yet available, the preliminary data indicate the underrepresentation or absence of such species as *Mitrax spinosissimus* and *Carpillius coralinus*. These species are commonly caught by trap and bottom gill nets by the contemporary Los Roques fishermen (Posada 1989; Posada et al. 1988; see also Salaya et al. 1985). If the low frequency or absence of these species is eventually confirmed, then my contention that the DM Valencioids did not use fish traps or bottom gill nets (see section 'Fishes' in this chapter) will be strengthened.

TABLE 56. *Numbers of skeletal elements (NISP) of sea urchins from Trench B, DM site.* *

Skeletal element	Taxa	0-20	20-40	NISP	MNI
Cidaridae *Eucidaris tribuloides* (Lamarck)	Primary spine, fragment	-	1	1	
Subtotal		0	1	1	1
Toxopneustidae	Carapace, peristomial region, fragments	-	2	2	
Tripneustes ventricosus (Lamarck) = T. esculentus	Polygonal fragments of ambulacral and interambulacral joined plaques	1	2	3	
	Polygonal ambulacral plaques	2	6	8	
	Polygonal interambulacral plaques	-	5	5	
Subtotal		3	15	18	1?
Echinometridae	Triangular fragment, aboral region of carapace	-	1	1	
Echinometra lucunter (Linnaeus) or *Echinometra viridis* Agassiz	Rectangular fragments of carapace, parts of ambulacral and interambulacral zones with primary tubercles?	-	1	1	
	Rectangular fragments of interambulacral zone of carapace with tubercles?	-	2	2	
	Fragment of peristomial zone of carapace with 6 primary tubers and podical pores	-	1	1	
	Primary spines	1	4	5	
Subtotal		1	9	10	1?
Brissidae *Plagiobrissus grandis* (Gmelin)	Fragment of carapace; region dorsal anterior	-	1	1	
Brissidae	Carapace fragment, worn	-	1	1	
Subtotal		0	2	2	1?
Total		4	27	31	4?

Taxonomic identification by Sheila M. Pauls. Central University, Caracas.

Sea urchins

The mature eggs of sea urchins are highly nutritive and have traditionally been considered as a delicacy by many societies all over the world (Clark 1933; Sloan 1984). The animals may be collected by hand or with the aid of a stick, during wading. They may be consumed raw, cooked or barbecued in their carapaces (Fell 1975).

A total of 44 species of sea urchins have been reported living in the Los Roques Archipelago (Zoppi de Roa 1967; Work 1969; Villamizar 1985). Pauls (1991) found sea urchins to be relatively abundant, associated with biotic communities of seagrasses, sandy bottoms and corals around Dos Mosquises Island.

Almost all archaeological remains of sea urchins at DM come from Trench B; only one spine was recovered in Trench C (Table 56). About 58% (N=18) of all identified skeletal elements pertain to *Tripneustes ventricosus,* the largest sea urchin in the Caribbean, whose diameter may reach about 15 cm (Clark 1933). This is also the species most appreciated as food in the region (Colin 1978). It is noteworthy that the remains of *Plagiobrissus grandis* (Gmelin) from the DM site are the first occurrence of this species outside eastern Venezuela (see Martínez 1969).

Outside the DM site two sea urchin spines were found in CS/D and OR/F sites; all of them pertained to the members of the family Echinometridae. Sea urchins have been reported from coastal Valencioid sites, indicating that they were commonly collected by the coastal Valencioids (Martín 1995). Whether or not they reached the Valencioid societies settled around Lake Valencia cannot be determined on the basis of available evidence.

TABLE 57. *Distribution of Balanus spp. remains at DM, CS/D and OR/F sites.*

Excavation unit/level	0-20	20-40	40-60	Total	Density*
		Dos Mosquises Island (DM)			
Trench A	55	8	0	63	3.7
Trench B	78	398	0	476	36.6
Trench C	15	190	6	211	10.7
Trench D	2	6	2	10	4.1
Trench E	0	33	0	33	20.6
Trench F	12	8	0	20	50
Subtotal	162	643	8	813	
		Cayo Sal (CS/D)			
Trench A	0	16	0	16	4.4
		Los Mangles (OR/F)			
Trench A	15	45	3	63	9.3
Total	177	704	11	892	

* Number of specimens per cubic meter of cultural deposit sieved with 1 mm^2 mesh.

It should be stressed that sea urchin exoskeletons and spines may easily be found washed ashore (see Bennett 1967: 211). I also found two fragments of sea urchin spines in two off-site test pits at DM 1 and 3 TP; Figure 30). In consequence, the sparse presence of sea urchin remains in insular sites cannot unquestionably be considered as evidence of their consumption by Amerindian people.

Barnacles

Barnacles (*Balanus* spp.) are sessile crustaceans often listed together with molluscs in archaeological reports (i.e. Sandweiss 1992: 99). They are edible although of low nutritional value. They live adhered to rocks, shells, dead corals, large mobile objects (i.e. boats) as well as to large marine animals such as turtles, large fishes and mollusc shells. Cipriani observed barnacles encrusted on dead shells of Muricidae and rare examples of barnacles encrusted on shells of live molluscs, in the Dos Mosquises area (Roberto Cipriani, personal information 1998). Were the barnacle from DM purposefully collected for food or did they enter the site attached to marine turtle carapaces or shells?

There is a positive relationship between the density of barnacle remains per cubic meter of cultural deposit sieved through one square millimetre mesh and the density of turtle carapace fragments per cubic metre of excavated cultural deposit. A layer of turtle carapace fragments underlay the cluster of ceramic, lithic and bone artefacts found in this trench. Moreover, I suggested earlier that part of these artefacts could be contained in turtle carapaces. However, even if barnacle remains were found in almost all Valencioid insular sites, they were not always associated with turtle bones or *botuto* shells. These data lead me to suggest that these crustaceans were brought to the site attached to turtles, large molluscs or coral stones. Yet, a certain quantity of them could be collected during canoe cleaning. Whether these animals were discarded or used as food cannot be determined.

Birds

Bird remains have rarely been discussed in Venezuelan archaeology (i.e. Wetmore 1935; Kidder 1944). However, they are not absent in the majority of archaeological deposits, but rather have been unrecovered and/or unidentified (see Dawson 1980[1963]). The report of Wetmore (1935) on archaeoavifauna from Kidder's excavations in La Cabrera still remains an unsurpassed, though simple, standard in the archaeology of north-central Venezuela. If anatomic/taxonomic analyses of archaeoavifauna have been ignored, so were their contextual analyses and the issues related to economic, social and symbolic uses of birds by prehistoric societies.

A total of 218 avian remains were found in DM, CS/D and OR/F Valencioid sites. 67 (31%) identified skeletal elements may represent at least 23 (MNI) individual birds of six different taxa (Table 59). The unidentified elements mainly include vertebrae, foot bones, eroded bones and small fragments. The major limb bones, that are the most durable and diagnostic part of the skeleton, dominate the identified bone sample. Head remains are extremely scarce, which suggests that birds may have been decapitated off-site and/or that the thin-walled and fragile bird skulls decomposed during the post-depositional time. The possibility of sacrificial offerings of birds, during which the heads were cut-off and discarded off-site, may also be taken into account (see Hamblin 1984: 95).

In DM site, the bird remains (NISP) were most abundant in Trench B (72%; N=26); however, the density in CS/D reached 7.5 NISP per cubic meter of cultural deposit compared to 0.6 in the DM site and 2.0 in Trench B. Seven out of eight identified taxa come from CS/D. The major abundance and taxonomic richness of avian remains from Cayo Sal may be related to the bird accessibility and availability that would be expected on an island that is considerably larger then Dos Mosquises Island and provides larger and more diversified microenvironments, such as mangrove swamps, marshlands, internal lagoons and open grass plains, for nesting and breeding.

Such pelagic species as *Pelecanus occidentalis* and *Sula* spp., represented at DM site, might have been captured while feeding on the shores of Dos Mosquises Island or while nesting on Bekevé, Celesky, Isla Larga or Cayo Sal islands (Phelps and Phelps 1950; Ginés and Yépez 1956: 68-69; Phelps and Meyer de Schauensee 1979: 12). The Los Roques fishermen catch dozens of juvenile *Sula* (especially in Celesky Island) and *Pelecanus occidentalis* (in Isla Larga and Cayo Sal) for food, during every breeding season of these birds (see Amend 1992a:170).

Other pelagic species, the flamingos, were almost surely captured outside the tiny Dos Mosquises Island. Between 1983 and 1990 I observed feeding flocks of flamingos in Cayo Sal, Los Cankyses, Isla Agustín, Gran Roque, Cayo Pirata, in Los Roques Archipelago, as well as in Cayo Los Holandeses, in the island group of La Orchila. At that time, the fishermen from Isla Agustín,

TABLE 58. ***The taxonomic abundance of identified avian remains (NISP and MNI) in Trenches A-C and E, DM site, Trench A and Pit 1 in CS/D site, and in the OR/F site.****

Taxa	Trench A NISP	Trench A MNI	Trench B NISP	Trench B MNI	Trench C NISP	Trench C MNI	Trench E NISP	Trench E MNI	CS/D** NISP	CS/D** MNI	OR/F NISP	OR/F MNI	Total NISP	Total MNI
Ciconiiformes	-	-	-	-	1	?	-	-	-	-	-	-	1	?
Ciconiiformes Threskiornithidae	-	-	-	-	-	-	-	-	5	3	-	-	5	3
Larus atricilla	-	-	-	-	1	1	-	-	1	1	-	-	2	2
Pelecanus occidentalis	-	-	16	1	5	1	1	1	9	3	-	-	28	5
Phoenicopterus ruber	-	-	6	1	1	1	1	1	4	2	-	-	10	4
Polyborus plancus	-	-	-	-	-	-	-	-	1	1	-	-	1	1
Sula spp.	-	-	1	?	-	-	-	-	1	?	3	2	5	3
Sula sula	1	1	3	1	-	-	-	-	6	2	-	-	8	2
Total	1	1	26	3	8	3	2	2	27	12	3	2	67	23

* Taxonomic identification by Miguel Lentino, Colección Ornitólogica Phelps, Caracas. **The remains from Trench A and the adjacent Pit 1 from CS/D site are counted together.

Cayo Sal and Cayo Pirata occasionally captured flamingos with long wires extended close to the water of internal lagoons. The birds fell down after bumping into the wire and could not stand up. They were then pursued for food. The Amerindians would have pursued flamingos not only for food but also, or even more, for their splendid rose-pink plumage.

The remains of pelagic species of Ciconiiformes Threskiornithidae from CS/D are probably those of the roseate spoonbill (*Ajaia ajaja*), an uncommon Los Roques bird which is occasionally captured by the fishermen for food and/or as a pet, while feeding in the lagoons of Cayo Sal. It should be noted that herons are not represented in the archaeological sample. They are not caught for food by the fishermen. Instead they are admired, and the fishermen are pleased when some of these birds sit on their boats. They offer them food, trying to incite the birds to make frequent visits to their huts (i.e. a semi-domesticated great blue heron [*Ardea herodias*] which, I observed in the early 1980s, was visiting the hut of Teobaldo Salazar in Isla Agustín). Certainly, it is hazardous to claim any possible ideological connection between modern and prehistoric Los Roques fishermen (i.e. the mythological 'beaky bird' was depicted on petroglyphs and artefacts all over Caribbean and Guiana [José Oliver, personal communication 1998]); however, it is noteworthy that I have never heard of fishermen capturing herons in Los Roques Archipelago.

The DM and CS/D bone samples, except for two, represent birds that are contemporary food species and are modern inhabitants or visitors to these islands (Phelps and Phelps 1950; Sociedad 1956; Buitrago 1987a; Phelps and Meyer de Schauensee 1979; Lentino et al. 1994; Luy and Lentino 1994). The first exceptions are remains of crested *caracara* (*Polyborus plancus*), the representative of the family Falconidae, found in CS/D. This medium-sized bird of prey is a common visitor to arid and marshy open areas from southern North America to South America (Bond 1985: 331); however, it has never been reported from the Los Roques Archipelago (Sociedad 1956; Phelps and Meyer de

Schauensee 1979). The possibility that the bird could occasionally have visited these islands in the past cannot be discarded. In 1987, 1988 and 1989, I saw several of these birds in La Blanquilla Island, ca. 100 km north of La Margarita Island. Alternatively it may be considered that the bones were brought to the island for unknown purposes or, that a live bird was brought as a pet. From the presence of one bone only, complex inferences of any sort cannot be drawn. However, in the DMN Ocumaroid site at Domusky Norte Island, several complete bones of *caracara*, such as skull parts, humerus, ulna, femur, tarsal, many of them paired, were also found. It has been suggested that whole bird might have been brought to this site as a pet (Miguel Lentino, personal communication 1992). However, it might also have been a dead bird especially prepared as a head-dress and used in ceremonial/ritual contexts.

The second non-food species is migratory *Larus atricilla* represented by two bones from DM and CS/D sites. One bone of the same species was also found in the DMN Ocumaroid site. These birds are seasonal visitors to Los Roques Islands and, therefore, the presence of their bones may potentially be indicative of seasonal occupation of the sites. However, it is difficult to weave interpretative webs based on the presence of only one bone per site. The Laridae were obviously not target species for insular Valencioids and their remains would belong to the group of partial migrants which may have been brought to the site from other areas or were an occasional by-product of skinning carcasses for feathers (see Morales Muñiz 1993: 6; Chaplin 1971: 158). In any case the applicability of the present-day data on bird seasonal activity to the distant past is often of limited value for inferring prehistoric seasonal patterning (see Grayson 1984: 177). I should add that eggs of *Larus atricilla* and *Sterna* are collected for food by the fishermen of Los Roques Archipelago and, until recent times, were 'exported' to popular markets of Margarita Island and the continental coast. Even if the evidence of prehistoric egg gathering is not confirmed for insular sites, this practice might have been one of the complementary food procuring activities.

Worked bird bones are extremely rare artefacts in insular Valencioid sites. One midshaft cut out of an ulna of *Pelecanus occidentalis* was found in Trench B, DM site. One distal fragment was cut from an ulna of *Sula sula*, probably to separate the midshaft, in the CS/D site. The bone midshaft was probably inserted in necklaces together with perforated shell and/or stone beads.

Bird feathers and 'botuto' trumpet sound

Except for flamingos, all birds whose remains were recovered from insular sites are also available on the continental coast of north-central Venezuela. In the southern Caribbean the centre of reproduction of flamingos is located at Bonaire Island (Rooth 1976: 16). In insular Venezuela the breeding areas of these birds is reported from La Orchila and Isla de Aves and their feeding localities include Margarita Island, Morrocoy and Laguna de Tacarigua (Phelps and Meyer de Schauensee

1979: 28; de Boer and Rooth 1976: 40). These birds were breeding in Los Roques Archipelago in the 1880s (Bruni Celli 1968).

The consistent presence of flamingo bones in Valencioid sites on Los Roques Archipelago indicate that they were one of the target species, probably for their splendid plumage. These birds were not available in the mainland coast controlled by Valencioid people, and therefore the feathers might have been a highly prized wealth objects.

The bird remains from mainland Valencioid sites are much less numerous than any other group of faunal remains and are, largely, taxonomically unidentified (Martín 1995: 229). Therefore, the focus of attention is shifted from the coast itself to the inland Valencia Basin. There, the remains of 20 local species, frequent in aquatic or marshy habitats of the lake, were recovered, mainly in deep, Barrancoid deposits, in the La Cabrera site (Wetmore 1935; Kidder 1944: 76).

Even though bird remains are scarce in archaeological deposits (or unrecovered/unreported) bird motifs are common in Valencia style iconography. They are modelled as vessel rim adornos (Osgood 1943: Fig. 8, b; Fig. 9; Bennett 1937: 102, Fig. 9; Kidder 1944: Plate 2, 10), represented on ceramic whistles or ocarinas (Requena 1932: 145, 147) and carved in stone as a small 'amulets' (Bennett 1938: Fig 17; Requena 1932: 143; Kidder 1944, Plate 11, 43). Carved bat wing pendants in shell and stone were also recovered from VLB sites (Bennett 1937: Fig 15; von den Steinen 1904; Alvarado 1912; Oramas 1946). The majority of these objects were found in human burials. These data suggest that birds played an important role in the ceremonial life of Valencioid societies, and possibly had a mythological significance and symbolic meanings.

It is interesting to emphasise that birds are also depicted on several objects recovered at Dos Mosquises. One is a small bird figure in shell, very similar to Kidder's specimens from La Cabrera (Kidder 1944: Plate 11, 43). A ceramic pendant or sinker in the form of a bird was also recovered. An open bowl with annular base has two rim adornos modelled in form of birds with extended wings. Two small owl-like rim adornos were also found. Finally a large anthropo-zoomorphic vessel seems to represent a personification of a bat. The representations of birds on insular objects may strengthen the cultural connection between the segments of Valencioid societies from the VLB and the insular visitors.

It is noteworthy that, according to the Governor Pimentel's *Relación* dated to 1578, during the communal feasts called *Itanera* the *Caraca* Indians from north-central Venezuela use masks and

> bring some birds, [and] other animals atop wooden sticks [decorated] with thread and colours [and] as if they were in nature, they were seated on trees and they [Indians] imitated their movements (Pimentel 1964[1578]: 121-122).

Garlands of coloured feathers and heads of animals were also used as special dresses for these ceremonies (see Nectario María 1979: 342). Civrieux (1980: 187) interpreted the imitation of animal

TABLE 59. *Distribution of identified bird remains in DM, CS/D and OR/F sites.*

Taxa	Skeletal element/anatomic position	Portion of the element	NISP by level 0-20	NISP by level 20-40	Catalogue number	MNI
Dos Mosquises Island (DM), Trench A						
Sula sula	Ulna	midshaft fragment	1	-	3920	1
Subtotal			1	0		1
Dos Mosquises Island (DM), Trench B						
Pelecanus occidentalis	Coracoid	fragment	1	-	4221	
Pelecanus occidentalis	Quadrate	complete	-	1	4250	
Pelecanus occidentalis	Femur	complete	-	1	6321	
Pelecanus occidentalis	Mandible (left)	articulation, proximal fragment	-	1	4271	
Pelecanus occidentalis	Carpo-metacarpus	distal fragment	-	1	4229	
Pelecanus occidentalis	Radius (left)	distal fragment	-	1	4223	
Pelecanus occidentalis	Radius (right)	proximal fragment	-	1	4218	
Pelecanus occidentalis	Radius (right)	distal fragment	-	1	4275	
Pelecanus occidentalis	Synsacrum	articulation fragment	-	1	4248	
Pelecanus occidentalis	Ulna	midshaft cut	-	1	4258	
Pelecanus occidentalis	Ulna (right)	proximal fragment	-	1	4273	
Pelecanus occidentalis	Radius	proximal fragment	-	1	4262	1
Pelecanus occidentalis?	Carpo-metacarpus	complete	-	1	4265	?
Pelecanus occidentalis?	Femur	distal end	-	1	648	?
Pelecanus occidentalis?	Ulna	fragment	-	2	593, 636	?
Phoenicopterus ruber	Coracoid	complete	-	2	4226 4255	
Phoenicopterus ruber	Humerus	head fragment	-	1	4254	
Phoenicopterus ruber	Humerus	head fragment	-	1	4256	
Phoenicopterus ruber	Sternum	complete	-	1	4249	1
Phoenicopterus ruber?	Cervical vertebra	fragment	-	1	4244	?
Sula spp.	Frontal	complete	1	-	2128	?
Sula sula	Coracoid (right)	complete	-	1	4246	
Sula sula	Ulna	midshaft fragment	-	1	4236	
Sula sula	Ulna (left)	proximal fragment	-	1	4264	1
Subtotal			2	24		3
Dos Mosquises Island (DM), Trench C						
Ciconiiformes	Tibio-tarsus	fragment (eroded)	-	1	1150	
Larus atricilla	Ulna	fragment	-	1	2127	1
Pelecanus occidentalis	Femur	complete	-	1	2802	
Pelecanus occidentalis	Radius	proximal end	-	1	1147	
Pelecanus occidentalis	Ulna	proximal end	-	1	1591	
Pelecanus occidentalis?	Ulna	fragment	-	1	1115	
Pelecanus occidentalis?	Ulna	fragment	-	1	1142	1
Phoenicopterus ruber	Carpo-metacarpus	complete	-	1	4806	1
Subtotal			0	8		3
Dos Mosquises Island (DM), Trench E						
Phoenicopterus ruber	Coracoid	fragment	1	0	2893	1
Pelecanus occidentalis?	Ulna	fragment	-	1	16222	1
Subtotal			1	1		2
Cayo Sal (CS/D), Trench A						
Ciconiiformes, Threskiornithidae	Tibio-tarsus	midshaft	-	1	1853	
Ciconiiformes, Threskiornithidae	Tibio-tarsus	proximal end	2	-	2113 2114	
Ciconiiformes, Threskiornithidae	Tarso-metatarsus	distal end	1	-	2115	
Ciconiiformes, Threskiornithidae	Tibio-tarsus	proximal end	1	-	2118	3
Larus atricilla	Humerus	eroded	-	1	2125	1
Pelecanus occidentalis	Femur	complete	1	-	2117	
Pelecanus occidentalis	Femur	complete	-	1	2122	
Pelecanus occidentalis	Trochlea-tarso-metatarsus	complete	1	-	7917	
Pelecanus occidentalis	Femur	complete	-	1	4812	
Pelecanus occidentalis	Carpo-metacarpus	complete	-	1	4813	
Pelecanus occidentalis	Coracoid	fragment	-	1	4816	
Pelecanus occidentalis	Tibio-tarsus (right)	complete	-	1	4841	2
Phoenicopterus ruber	Tarso-metatarsus	distal end	1	-	2119	
Phoenicopterus ruber	Tarso-metatarsus	distal end	-	1	2124	
Phoenicopterus ruber	Femur	complete	-	1	2121	1
Polyborus plancus	Ulna (left)	complete	-	1	3557	1
Sula spp.	Coracoid (right)	complete	-	1	4815	?

TABLE 59. (cont.)

Taxa	Skeletal element/anatomic position	Portion of the element	NISP by level 0-20	NISP by level 20-40	Catalogue number	MNI
Sula sula	Ulna (right)	distal fragment cut	1	-	3273	
Sula sula	Ulna (left)	proximal fragment	1	-	3238	
Sula sula	Humerus	complete	1	-	7918	
Sula sula	Humerus (left)	distal fragment	1	-	2744	1
Subtotal			11	11		9
Cayo Sal (CS/D), Test Pit 1						
Pelecanus occidentalis	Ulna	distal fragment	-	1	3415	
Pelecanus occidentalis	Ulna (right)	fragment	-	1	3418	1
Phoenicopterus ruber	Tarso-metatarsus	proximal fragment	1	-	3426	1
Sula sula	Ulna (left)	proximal fragment	1	-	3417	
Sula sula	Humerus (right)	distal fragment	-	1	2429	1
Subtotal			2	3		3
Los Mangles (OR/F), La Orchila Island, Trench A						
Sula spp.	Pelvis	fragment	-	1	16819	
Sula spp.	Pelvis	complete	-	1	16820	
Sula spp.	Coracoid	complete	-	1	16836	2
Subtotal			0	3		2
Total			17	50		23

voices by the *Cumanagoto* hunters and shamans as magical callings used to attract the animals and/or to conciliate their protector spirits.

Pimentel indicated that one of the main ways to achieve social status in *Caraca* societies was through exceptional valour and bravery. The warriors were ranked according to their achievements in battles (i.e. by the number and status of killed enemies). They received a new name after each slain enemy and were rewarded with a respective number of crowns or feathers (Pimentel 1964[1578]: 125). In fact, the Conquerors could recognise the prominent warriors in battle by their feather crowns (Oviedo y Baños 1982[1722] vol.2: 461). Oviedo y Baños (1982[1722], vol.1: 264; vol.2: 397, 398, 414] repeatedly emphasises the abundance of splendid feather head-dresses or crowns (*penachos de plumas*) displayed by the *Caraca* warriors. Given the large quantity, diversity and splendour of *penachos*, as well as the fact that the skills of each warrior were scrupulously assessed and adequately rewarded with feathers, it may be hypothesised that to produce (at least) some of the most important *penachos* (i.e. for chiefs) certain exotic feathers were used and that skill was required for their manufacture. These objects may have been made by specialists attached to the military elite.

The military power of battle-ready *Caraca* was externalised by the *penachos*, the sounds of *botuto/fotuto* (*Strombus gigas* shell and wooden or cane trumpets) and drums, special body painting, insignia or emblems (*banderas*), display of weapons and shouting (Oviedo y Baños 1982[1722] vol.1: 261, vol.2: 391, 514). The chiefs *Paramaconi* and *Toconai* were seen wearing jaguar (*tigre*) skins, hangings down from their *penachos*. I consider that the above data indicate a meaningful connection between bird feathers, *botuto* shell trumpets and warriorship, for the protohistoric descendants of the Valencioid societies.

I should also mention that birds served as ethnic names for some *Caraca* Indian groups. According to Pimentel (1964[1578]: 114) the ethnonym of *Quiriquires* is related to the fact that many trees with this name grow in their territory, or because

> in their land and in other [adjacent lands] used to roam flocks of small birds that in Castilla la Vieja are called *linazeros*, and because these birds are so numerous, as numerous as this nation [partiality], then the other Indians call them Q*uiriquires*, this is as if they said: they are so numerous as the *quiriquiros* birds are.

The *Toromaymas*, who apparently moved to the Caracas Valley from some other unknown region, derived their name from a name of a bird which, when singing, emits sound similar to *mayma* 'and the general name of all birds is *toro*, so this is as if they [Indians] would like to say: the bird who sings mayma (Pimentel 1964[1578]: 114).

Other *Caraca* ethnic names were related to local grasses (*Caraca)* or herbs (*Guarenas*), peccary or *báquiros* (*Baquiratota*), names of prominent chiefs, rocks or ravines (Pimentel: 1964[1578]: 121; see also Biord 1995: 190-191).

The historical continuity between the bearers of the Valencia style pottery from VLB and the *Caracas* Indians has not been demonstrated. However, the bearers of the El Topo style pottery, a peripheral member of the Valencioid series, from the central-northern slopes of the Cordillera de La Costa, may be related to a proto-historic fraction of the *Caraca* Indians. Some structural continuity might have linked these prehistoric and protohistoric cultural manifestations. The use of animal representations (probably carved in wood or especially prepared, stuffed real birds and other animals) held atop wooden sticks by different participants at the feasts, and the imitations of their behaviour may also suggest that different segments of *Caraca* societies were represented by, and related to, a particular animal totem.

If analogies drawn from *Caraca* Indian ethnohistory can be used in the interpretation of the Valencioid artefacts recovered in Dos Mosquises Island, then certain insular birds might not only have been captured for food and/or feathers, or used as pets, but also may have been used for ceremonial purposes and related to warriorship.

Whether the low quantity of bird remains in Valencioid (relative to the higher proportion in Barrancoid) deposits, noted by Kidder (1944: 76), may be linked or not to the rise of the role of birds as totems and the imposition of taboos and hunting prohibitions on several bird species cannot be ascertained at present. However, striking evidence that all Valencioid insular sites together yielded notably fewer bird remains than Ocumaroid (DMN) and Dabajuroid (AG/A) sites, may be linked to this hypothesis.

Mammals

Material and methodology

The archaeological mammal bone remains from South American neotropics are usually exposed to hostile diagenetic environments that severely limit their physical integrity (Stahl 1995). The bone assemblage recovered in primary archaeological contexts of DM site are one exception since, as it will be demonstrated, they had not been notably altered.

The taxonomic identification of the insular mammal bone specimens was carried out by Dr. Omar Linares of the Laboratory of Palaeontology of the University of Simón Bolívar, and by the author in the Archaeological Laboratory of Los Roques Scientific Foundation in Caracas. A few specimens have been identified by Dr. Elizabeth S. Wing from the Department of Anthropology, University of Florida, Gainesville.

The inventory embraces 124 bones belonging to 11 different taxa of mammals (Table 60 [see also Antczak n.d.). Using the broad definition of artefacts (Dunnell 1971), the inventory was subdivided into four categories of artefacts (Table 61). The 'worked bones and teeth' category includes finished forms that were manufactured with the use of utensils; traces of manufacture can be often observed. Their use-function can generally be inferred from their overall morphology and physical-chemical properties. The 'modified bone' category comprises specimens that were broken and/or fractured by a human being; they do not show use-wear. The third one is a category of 'unmodified bones'. The function and meaning of specimens pertaining to the last two categories are not possible to infer without the rigorous contextual analysis and interconnection of the archaeological evidence with pertinent ethnohistorical analogies. The fourth category includes manufacture debitage.

Eighty-five (68.5%) specimens were identified to species, five (4.0%) to genus, one (0.8%) to family and 33 (26.6%) to order level; 92 (74%) skeletal elements were identified; the zooarchaeological quantification standards utilized were Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI). NISP and MNI numbers were calculated for each excavation unit and level, and the results were combined.

Taphonomic and diagenetic remarks

The bone specimens from Dos Mosquises Island, that constitute 85% of all mammal bone remains recovered in Los Roques Archipelago, are well preserved. Their surfaces are light-brown and smooth, which indicates that, despite high seasonal humidity and temperature combined with the salinity of the insular environment, they were not significantly affected through diagenesis. Only the Cayo Sal specimens (4.8%), recovered on the shore of an inner lagoon seasonally flooded by hypersaline water, were severely altered by the salt.

TABLE 60. ***NISP and MNI calculated for identified mammal bone specimens from DM site.***

Taxa	NISP	MNI
Alouatta seniculus	1	1
Cerdocyon thous	3	2
Dasypus novemcinctus	47	1?
Dicotyles tajacu	3	1
Didelphis marsupialis	1	1
Felis pardalis	3	3
Felis wiedii	22	8
Mazama sp.	5	2
Mustelidae	1	1
Odocoileus gymnotis	5	3
Tapirus terrestris	1	1
Total	92	24

The mammal bones from DM site lack root-marking similar to these illustrated by Binford (1981) and White (1992), which are usually left by plant roots seeking for the buried bones as a nutrient source (Stahl 1995). However, the human bones recovered at the same site do show strong root marks. To explain this aspect of differential preservation it can be suggested that the human bones were buried with the still adhering flesh, whereas the fragmentary mammal specimens may have been brought to the site without flesh, as a raw material, as implements and/or as special-use symbolic artefacts. If the mammal bones were not deposited with the adhering flesh, for some other reason they were neither exposed to scavenging nor to three-dimensional displacement by lizards, hermit crabs and birds.

Rodent bioturbation is absent in these islands, as rodents are not autochthonous. The sample could not have been altered by dogs either, since gnawing marks on mammal and non-mammal bones (marine turtle, fish, bird) have not been observed. The presence in the zooarchaeological sample of small (both mammal and non-mammal) bones can also suggest that the dogs were absent or very rarely present in Los Roques Amerindian campsites (see Lyon 1970).

TABLE 61. ***Distribution of mammal bone remains in DM and CS/D sites.***

Site/Trench/ Remain category	Trench A		Trench B		Trench C		Trench E		CS/D		Total
	N	%	N	%	N	%	N	%	N	%	
Worked bones	5	15.15	19	57.57	3	9.09	-	-	6	18.18	33
Modified bones	1	4.76	15	71.42	5	23.80	-	-	-	-	21
Unmodified bones	2	3.50	49	87.96	4	7.01	1	1.75	-	-	56
Debitage	-	-	12	85.71	2	14.28	-	-	-	-	14
Total	8	6.45	95	76 61	14	11.29	1	0.80	6	4.83	124

Since the islands have no native mammals, all the bone material must have been brought to the Archipelago from elsewhere. It can cautiously be assumed that the bones had rather been carefully selected by the Amerindians before leaving their permanent settlements on the continental coast and/or Lake Valencia shores.

TABLE 62. ***Frequencies, location, selected measurements (mm) and types of mammal bone artefacts (worked bones) from DM and CS/D sites.***

Artefact type	#	Skeletal element	Taxa	Length (max.)	Width (max.)	Site/trench code	Catalogue number
Pointed bones:							
Bipoint	3	UID	Mammalia	60.14	8.10	DM/A	16771
		UID	Mammalia	77.50	9.50	DM/A	16772
		UID	Mammalia	53.11	7.19	DM/B	635
Unipoint	3	UID	Mammalia	50.50	8.50	CS/D/A	2113
		UID	Mammalia	37.10	6.75	DM/B	16760
		UID	Mammalia	70.60	9.45	DM/C	1125
perforated	1	UID	Mammalia	68.54	14.18	DM/B	724
Barbed unipoint	1	UID	Mammalia	31.50	4.85	DM/B	16761
Unipoints or	6	UID	Mammalia	2.75	4.50	DM/B	3024
bipoints		UID	Mammalia	3.70	8.40	DM/B	2893
(fragments)		UID	Mammalia	45.15	10.50	DM/B	16759
		UID	Mammalia	22.05	5.55	DM/B	16769
		UID	Mammalia	60.50	8.00	CS/D/A	1779
		UID	Mammalia	5.50	7.40	CS/D/A	3163
perforated	1	UID	Mammalia	39.90	6.35	DM/C	16766
Awl/perforator	1	UID	Mammalia	51.00	16.00	CS/D/A	3236
Flutes:	3	radius (left)	*Odocoileus*	149.20	20.11	DM/B	588
			virginianus	140.15	19.08	DM/B	592
				142.22	19.30	DM/B	587
	2	radius (left)	*Mazama* spp.	110.50	15.23	CS/D/A	1725
				93.50	15.74	CS/D/A	1726
Pendants:							
Perforated	3	incisor	*Cerdocyon*	21.50	6.50	DM/B	9064
teeth		tooth	*thous*	30.25	9.35	DM/C	1170
				14.00	4.80	DM/B	16762
	2	canine	*Dicotyles*	49.32	13.12	DM/A	16780
		tooth	*tajacu*	59.10	11.70	DM/B	9060
	1	molar	*Tapirus*	30.00	23.80	DM/B	16770
		tooth	*terrestris*				
Tubular bead	1	UID	Mammalia	48.10	13.10	DM/B	7061
Perforated	1	vertebrae	*Odocoileus*	74.75	54.25	DM/A	595
bones			*virginianus*				
	1	dermal	*Dasypus*	19.70	5.25	DM/B	18199
		bone	*novemcinctus*				
	1	UID	Mammalia	33.20	8.18	DM/B	1713
	1	UID	Mammalia	35.05	5.75	DM/B	16773
Worked vertebrae	1	vertebrae	*Odocoileus*	78.90	58.62	DM/A	1131
			virginianus				

DM/A, DM/B, DM/C = Trenches A, B and C in DM site; CS/D/A - Trench A in CS/D site.

Worked bones and teeth

A total of 33 worked bones and teeth have been grouped into four analytical categories according to their morphology and possible function (Table 62). The spatial distribution of these specimens is highly uneven: 27 (81%) have been found at DM, the rest at CS/D site.

The pointed bones are the most numerous category (N=16; 48%). There are three bipoints and five unipoints in the sample. One of the unipoints is perforated, another is unilaterally barbed. Seven artefacts are midsections and broken tips of pointed bones representing artefacts that have been damaged during manufacture or use. The shaft cross-sections of five of these artefacts are rounded and grooved, the others are rounded and ungrooved. Another artefact of this category, the awl/perforator, was made from a fragment of split vertebra or a long mammal bone. This artefact presents use-wear on

TABLE 63. ***Frequencies, selected measurements (mm) and location of manufacturing waste (debitage) and point preforms of mammal bone, DM site.***

Artefact	#	Skeletal element	Taxa	Length (max.)	Width (max.)	Trench
Split diaphysis	2	Long bone	Mammalia	68.75	13.90	B
(large fragment)			Mammalia	55.00	18.98	C
Splinter	2	UID	Mammalia	41.00	4.85	B
(bipointed)		UID	Mammalia	35.65	3.35	B
Splinter	1	UID	Mammalia	40.10	8.25	B
(unipointed)						
Splinter	5	UID	Mammalia	21.15	2.80	B
(rectangular)		UID	Mammalia	25.05	4.80	B
		UID	Mammalia	26.20	8.85	B
		UID	Mammalia	23.38	7.80	B
		UID	Mammalia	29.20	11.78	C
Point preforms:	2	Long bone	Mammalia	58.20	9.15	B
unipoint		Long bone	Mammalia	58.65	9.78	B
bipoint	1	Long bone	Mammalia	63.86	10.00	B
uni or bipoint	1	Long bone	Mammalia	50.18	8.50	B

its sharp edge, and has been prepared to fulfil two functions: the pointed tip for perforation and the sharp and bevelled proximal edge for cutting and/or scrapping.

The most distinctive group of worked bones is composed of five flutes. Three bone flutes recovered from Dos Mosquises were made from the left radius of adult white-tailed deer (*Odocoileus virginianus*). Two others, found at Cayo Sal, were made out of the same skeletal element, but belonged to a brocket (*Mazama* sp.), a smaller species of deer. Two flutes from Dos Mosquises have four perforations for the modification of the sound, the others have only three perforations each; all of them have one perforation on the opposite side, near the mouth end. The smallest of the Cayo Sal specimens showed traces of red painting.

In the Los Roques collection there are also three subcategories of bone pendants. The first includes three incisors of crab-eating fox (*Cerdocyon thous*), two canine teeth of collared peccary (*Dicotyles tajacu*) and one molar tooth of tapir (*Tapirus terrestris*). All were perforated for suspension on a string. The second category includes one tubular bead. The next item in the category of perforated bones is a small fragment of a plain, rectangular plaque, with five biconical perforations. Another artefact is a pendant made out of a plain piece of a tooth-shaped bone. Finally, one vertebra of brocket has ground spine tips and is perforated for the suspension. In this category there is also one vertebra of brocket, worked in the same manner as the previous one but without perforation.

Manufacturing debris

Fourteen splinters separated from the shafts of mammal long bones are included in the category of manufacturing debris (Table 63). These specimens represent preforms and/or debitage resulting from bone point manufacture. Twelve (85%) of them were found in Trench B, at Dos Mosquises Island.

Worked bones: contexts, comparisons and discussion

Worked mammal bones are scarce in number and their functional diversity is very low. They have been found only in two of the 27 archaeological sites of Los Roques Archipelago. Both in Dos Mosquises and Cayo Sal, these artefacts have been found exclusively within the areas of concentration of lithic, bone, shell and ceramic artefacts. In both cases, the spatial association and distribution of mammal bone remains indicate that the activities linked to their use and/or storage were spatially circumscribed, and point out the special value attached to them by the Amerindians. Mammal bone artefacts are rare finds in the Valencioid sites in the islands as well as on the continent. From all the insular area, where Valencioid sites have been located, only two unipoints were reported from Los Mangles site, La Orchila Island (52 km to the East of Los Roques [Figure 18]).

The comparative data from the continent is very scarce, partly due to the action of taphonomic agents and partly as a result of inadequate techniques of excavation. Uni- and bipoints, similar to the Los Roques specimens, have been reported from the eastern shore of Lake Valencia on the mainland (Kidder 1944; Osgood 1943; Bennett 1937). Pendants made out of mammal teeth were also common in Valencia archaeological deposits. Kidder (1944: 77, Pl. XII) found samples of jaguar canine and peccary teeth and fox astragalus drilled for suspension.

A sample of seven flutes (Requena 1932; Osgood 1943, Lam.15 H; Rouse and Cruxent 1963: 87-8, Lam.38 A) and two probable flutes (Kidder 1944, Lam.12) from excavations on shores of Lake Valencia is morphologically quite different from those from Los Roques. All these mainland specimens were three-holed flutes and five of them were carved with complex designs. However, five of these flutes (four of them decorated) come from Requena's unsystematic excavations; therefore, it is difficult to determine if they formed part of the Valencioid or the earlier Barrancoid cultural baggage of Lake Valencia area.

It should be emphasised that the use of the deer-bone flutes was widespread among native Americans during ethnohistoric times (von Hornbostel 1982: 334; see López de Gómara 1979[1552]: 124), and nine indigenous groups from Venezuela still make and use them today (Aretz 1991: 37; Wilbert 1956).

Modified bones

All 21 modified bones have been found in Dos Mosquises island site in three different trenches (see Table 64). This category comprises mandibles and maxilla fragments of at least 11 (MNI) individuals of small wild cats: margay (*Felis wiedii*) and ocelot (*Felis pardalis*). All the mandibles and maxillas were broken into two parts with one canine in each half. In seven mandibles, the ascending ramus was broken or cut off diagonally just behind the last teeth. Five (24%) mandibular bones display traces of cutting, chipping or incising. One left mandible fragment (Catalogue Number 1132) shows

TABLE 64. ***Frequencies, location, taxon and skeletal element identification of mammal bone artefacts (modified bones) from DM site.***

Taxon	NISP #	NISP %	MNI #	MNI %	Skeletal element	Trench	Catalogue number
Felis wiedii	18	85.71	8	72.72	left maxilla	B	610, 640, 597
						C	16776, 16777
					left maxilla (juvenile)	B	603, 1134
					left maxilla (subadult)	C	16779
					right maxilla	B	631, 1129
						C	16778
					right maxilla (juvenile)	B	621
					left mandible	B	583, 1154, 599
						C	1132
					left mandible (juvenile)	B	613
					right mandible	B	9059
Felis pardalis	3	14.28	3	27.27	left mandible (juvenile)	B	612, 16781
						A	582
Total	21	99.99	11	99.99			

fine traces of cutting and another right mandible has slightly broader, shallow, probably incised grooves. In both cases, the marks are situated on the buccal side at the point between the horizontal and ascending ramii and run diagonally from the superior-posterior (distal) to the inferior-anterior (mesial) side of the mandibles. The morphology, location and orientation of the marks indicate that these cuts would have been made to facilitate the breaking-off of the ascending ramus. One specimen shows heavy traces of chipping and cutting on the upper side, which would have been done for better adjustment of the string that would have tied up the handle of the possible implement. Another fragment has traces of diagonal incisions produced by the pressure of a string that tied the fresh bone to the wooden handle. Only one maxilla shows fine cutmarks on the zygomatic process, which is morphologically similar to that of specimen 1132. Similar marks, on human mandibular specimens, have been interpreted by White (1992: 198-9) as a results of cuts through the fibres of the masseter muscle. These marks on Dos Mosquises specimens would have been left by the stone cutting tool or molluscan shell knife when the skin was cut-off (skinning marks). Both types of implements produce morphologically similar cut-marks on animal bones (see Toth and Woods 1989).

According to Semenov (1964: 152), modifications of mammal mandibles, such as those described above, were common signatures left in the manufacture of prehistoric implements. However, use-wear was not observed on the Los Roques specimens. One can only hypothesise that if the mandibles were utilized as implements, they might rather have been used to perforate or pierce some kind of soft material and not for cutting or sawing hard materials (shell or bone). Ethnoarchaeology and experimental studies can shed new light on this question. For example, the use-wear left on unmodified lower jaws of peccary (with the teeth intact) used by the Yanomamö Indians from southern Venezuela as a plane for smoothing and shaping of the bow (Couture-Brunette 1985), has not yet been investigated.

TABLE 65. ***Frequencies, location, taxa and skeletal element identification of mammal bone artefacts (unmodified bones) from DM site.***

Taxa	NISP #	NISP %	MNI #	MNI %	Skeletal element	Trench	Catalogue number
Felis wiedii	4	7.02	2	22.22	calotte (juvenile)	B	633, 650
					phalanx	B	9058
					right mandible	B	609
Alouatta seniculus	1	1.75	1	11.11	skull (subadult female)	B	1156
Mazama sp.	3	5.26	2	22.22	left tarsal (adult)	B	589
					left radius (adult)	B	4501
					left radius	B	590
Didelphis marsupialis	1	1.75	1	11.11	right ramus of the mandible	A	1135
Mustelidae	1	1.75	1	11.11	right mandible	B	16782
Dicotyles tajacu	1	1.75	1	11.11	claw	A	16795
Dasypus	41	71.92	1?	11.11	dermal bones	B	bag # 17987
novemcinctus	4	7.01			dermal bones	C	bag # 17988
	1	1.75			dermal bones	E	bag # 17989
Total	57	99.95	9	99.97			

Unmodified bones

This category includes the skull of a red howler monkey (*Alouatta seniculus*), two cranial vaults and one complete mandibular ramus of margay cat (*Felis wiedii*), one mandibular ramus of common opossum (*Didelphis marsupialis*) and other of weasel (Mustelidae [Table 65]). All these specimens pertained to the heads of the animals. Among the unmodified bones of the wild cats there is one terminal phalanx of the middle finger of ocelot or margay cat. The category is completed by two left radii, one left tarsal of brocket (*Mazama* sp.) and a claw of peccary (*Dicotyles tajacu*). In Domusky Norte site a mandibular ramus of brocket (*Mazama* sp.) was recovered.

Modified and unmodified bones: contexts, comparisons and discussion

Sixteen (78%) modified, and all unmodified, bones from Dos Mosquises island were contextually associated with complete and semi-complete ceramic vessels (often decorated), human figurines, clay pipe, lithic microaxes, shell and stone pendants and shell beads. These contexts, spatially well delimited in Trenches A and B, have been interpreted as central areas of the multifunctional Valencioid campsite (Antczak and Antczak 1991).

The remaining five (22%) modified bones were found scattered in the human burial area of the Trench C, where small clusters that contained a few human clay figurines and decorated potsherds were recovered. Looking outside Dos Mosquises Island for specimens for comparative analysis it should be stressed that one unmodified mammal bone was recovered on the nearby Domusky Norte Island. Interestingly, this mandibular ramus of brocket (*Mazama* sp.) was recovered in a small cluster of artefacts that included human figurines, microvessels, land snail shell pendants and resin. Even though the ceramic assemblage of Domusky Island is different from Dos Mosquises pottery, there are striking similarities in the contextual associations of the above mentioned artefacts.

In Valencioid sites on mainland Venezuela only a small number of mammal bones have been properly recovered and identified. The most complete record comes from Berry's (1939) report on faunal remains identified from Kidder's and Osgood's excavations on the north-eastern and eastern shores of the Lake Valencia. Unfortunately, neither taxonomic frequencies nor skeletal element specifications were presented. The bones of deer, fox, bear, peccary, jaguar, tapir and dog were mentioned among others (Berry 1939). Bennett (1937: 88, Fig.6) mentioned finding an animal skull in the La Mata mound; however, neither comments nor identification of the specimen were offered.

Outside the Valencia Basin, fragments cut off from the long bones of white-tailed deer and other fragments of the distal epiphysis of brocket tibias have been reported from Puerto Maya and Playa Chuao, two coastal sites linked to the Valencioid cultural series (Alvarez and Casella 1983; Morales 1984; Martín 1995).

On Aruba, Curaçao and Bonaire islands located to the west of the Los Roques Archipelago, a few mammal bone remains have been recovered from the late prehistoric permanent settlements related to Dabajuroid cultural tradition. From Aruba the bones of *agouti (Dasyprocta agouti)*, wild cat (*Felis tigrina*) and deer (*Odocoileus gymnotis*) have been reported (Hooijer 1960). The bones of paca (*Agouti paca*), agouti (*Dasyprocta* sp.), deer (*Odocoileus gymnotus*), and brocket (*Mazama gouazoubira*) have been reported from Curaçao (Hooijer 1963; Haviser 1987). In the Wanapa site, in Bonaire, were recovered the remains of various indeterminate rodents including mice (*Calomys* sp.), and one modified ulna of ocelot (*Felis pardalis*). Several bones of a monkey (*Cebus* sp.) have also been recovered at this site, and it was suggested that a whole juvenile animal was brought from the continent (Haviser 1991), possibly as a pet.

On the continental coast of Venezuela, the bones of monkey (mainly *Alouatta seniculus*) and deer have been reported as probable food remains from the sites situated around Lake Maracaibo to the West (Sanoja 1969; 1970) and the Península de Paria to the East (Vargas 1979). The bones of tapir, deer, peccary and fox were recovered from the Coy-Coy de Uria cave, in north-western Venezuela (Falcón State), from the late prehistoric contexts (Pittevil 1984). The bones of red howler monkey and small wild cats have been reported from Trinidad (Bullbrook 1960; Wing and Reitz 1982). All the above mentioned remains have been recovered from different Ceramic Age cultural contexts.

The inferences, analogies and conclusions

The abundance in the Valencioid homeland area of the majority of mammals represented in the archaeological record has been well documented from the 16th century (Dupouy 1946) to the present (Eisenberg 1989; Mondolfi 1986; Tello 1979). Humboldt, in 1800, was surprised by the numerous groups of red howler monkeys living around the lake (Grases 1987: 184). The abundance of wild cats (*tigrillos*) called by the Caribs *maracaya* or *malacaya* (Alvarado 1953: 247) may represent an etymological origin of the name of the city of Maracay (founded in 1697) situated on the eastern shore of Lake Valencia (Requena 1932: 233). Kidder (1944: 21) observed that in 1933-34 deer were still very abundant around the lake.

All the mammal bones recovered from the insular sites analysed here passed 'through the cultural filter' at the moment when the Amerindian seafarers loaded their canoes on the continental coast.

Two groups of mammal bone remains were recovered from Los Roques Archipelago islands: (1) the majority were worked bones, whose function can be inferred, and (2) other bones, whose function and meaning is not so clear. Bone unipoints and bipoints can be associated with fishing activities and could have been used as projectile or spear points and/or fish gorges. Two perforated points may represent forms of composite fishing implements (harpoon heads?). These points, together with an awl and/or perforator, pertain to the category of work utensils. Additionally, splinters from mammal long bones may indicate that a small-scale manufacture of points and or/gorges took place on Dos Mosquises Island using the raw material brought from the continental coast. The two deer radii from Dos Mosquises site can be interpreted as the raw material used for projectile point manufacture. These bones had not been broken for marrow extraction, as would be expected for the long bones of the animals that were eaten *in situ* (Mori 1970).

In the Dos Mosquises site, the number of work utensils made out of mammal bone, as well as their functional variability, are very low in relation to the quantity and diversity of other artefacts (ceramics, stone and shell artefacts), the size of the campsite, and the multifunctional nature of activities carried out in it (Antczak and Antczak 1991).

The second group of mammal remains is composed of some worked bones (flutes and pendants) and all modified and unmodified bones. These objects were grouped together since I consider that a meaningful link existed between them. The presence of multiple bone fragments of the heads of the animals in the sample is especially intriguing. The following chain of functional and symbolic inferences can be postulated on the basis of a judicious application of ethnological analogy to the archaeological data.

Initially, when the first modified and unmodified mammal bones were found on Dos Mosquises island, I suggested that they represented the remains of smoked meat provisions and/or that some living animal pets had been brought by the Amerindians from the continent. The 'smoked meat' hypothesis was, in part, rejected because it was demonstrated that cranial and facial animal bones have medium to low meat content, in comparison to other bones (Uerpmann 1973). The custom of keeping different mammals as pets was reported by chroniclers of Venezuela (see Civrieux 1980: 162, 181; Morey and Morey 1980: 262). This custom is still observed among some contemporary Amerindian groups (Gross 1975), including those from Venezuela (i.e. Heinen [1988] for the *Warao*; Ruddle [1978] for the *Yukpa*; Cocco [1972] for the *Yanomamö*). However, the recurrent findings of the elements of mammal heads, and lack of any other skeletal parts, required alternative interpretations. After a much closer inspection of the bone specimens, it became evident that the majority (80%) lacked any traces of butchering-marks; not a single one showed evidence of use-wear or thermal alteration. This led to the conclusion that the great majority of mandibular elements and the cranial remains were probably not work utensils or food debris. The presence of wild cat cranial elements together with phalanxes would instead indicate that skins of wild cats were brought by the Amerindians to the islands. Moreover, all these remains were concentrated only on Dos Mosquises Island, where an important multifunctional Valencioid campsite was located. Furthermore, these specimens were contextually associated with ceremonial/ritual objects such as burners and resin, flutes, clay tobacco pipes, anthropo- and zoomorphic microvessels. On the basis of the contextual evidence, the correlation between these mammal remains and the ceremonial activities carried-out on the island seems evident.

Although scarce and heavily dependent on burial contexts, the available archaeological data from Lake Valencia area confirms the special meaning attached by Valencioids to some animals and their bones. In the La Cabrera site several unmodified animal bones were found in burials; one burial contained two deer antlers lying next to the head of the dead (Kidder 1944: 77, Fig.16, 2). Berry mentioned that at La Cabrera considerable quantities of animal bones were found directly associated with secondary burials (Berry 1939: 566, 557, Pl. IV, 1). In this realm of Valencioid ideology, monkey remains deserve a special mention. Marcano, in 1889, noted a monkey skull from the Valencioid mounds on the eastern shore of Lake Valencia (Marcano 1971[1889-1891]). In 1904 Alfred Jahn excavated in the same area and found a skeleton of monkey with a necklace (von den Steinen 1904). Osgood (1943: 23) suggested that the fragmentary skeleton with a necklace of more than a thousand beads of shell that was buried in the centre of the Tocorón mound was that of a monkey. Afterwards, more than 20 monkey burials were excavated on the western shore of the lake, accompanied by offerings similar to the human ones (Peñalver n.d.b: 14). Modelled representations of monkeys, wild cats (with annular impressions indicating spotted skins), turtles, frogs, birds and other animals often decorated Valencia style ceramic vessels (see for example Arroyo et al. 1971). Another piece of archaeological evidence also attracts attention: the remains of monkeys and wild cats (except for the jaguar, *Felis onca*) were not mentioned in Berry's (1939) report based on Kidder's and Osgood's excavations. It seems probable that taboo or other special restrictions would have been imposed by Valencioid societies settled on the lake shores over the hunting and consumption of these animals. Using ethnographic analogy, this evidence seem to indicate that monkeys, together with certain other animals, might be some kind of symbolically active totemic animals in Valencioid societies. The Carib-speaking *Cumanagoto* from the eastern coast of Venezuela, hunted and ate the red howler monkeys; Civrieux (1980: 163) suggested that food taboo could be imposed on other species of monkeys that inhabited the region (i.e. *Cebus apellus?*). Similar restrictions imposed by contemporary *Guahibo*

Indians on jaguars and foxes, among others, are the result of an old tradition according to which these animals are their totemic ancestors (Wilbert 1966: 76). Also documented are very complex animal taboo rules within the contemporary ethnic groups depending on the age, sex, social status and place of residence (i.e. for *Yanomamö* see Finkers [1986]; for Bari see Castillo [1989]). The presence of monkey skull in Dos Mosquises campsite emphasises the special role of this animal within the Valencioid ideology.

To give 'flesh to the bones' I looked into a varied palette of examples offered by comparative ethnology. This provides various meanings for the animal bones in the Amerindian societies that inhabited and still inhabit Venezuelan territory. The main analogies have been extracted from the ethnology of different coastal and marine oriented Carib-speaking groups, since the Valencioid people were probably Carib-speakers (see Chapter 4).

About the historic Cumanagoto, a Carib-speaking group from the eastern coast of Venezuela, Father Ruíz Blanco wrote in 1690 that: 'the claws of tigers they [the *Cumanagotos*] use as trophy necklaces and also use [for the same purpose] the teeth of any beast and other animal that they kill' (Ruíz Blanco 1965[1690]: 22). In 1883, Im Thurn (1967[1883]: 111) noted that in Guiana 'it is hardly possible to find an Indian house in which there are no teeth or portions of the skin of one of these species' (small 'tiger-cats'). Many contemporary indigenous groups of Venezuela, belonging to different linguistic stocks and with different modes of subsistence, attach a special value to the bones of game, particularly the head. The Guahibo (Wilbert 1966) and Guajiro (Saler 1988) hunters preserve selected bones of their game. The Taulipáng used to suspend the skull and bones of hunted animals from the roof over a fireplace (Koch-Grünberg 1981-82[1924]: vol.3: 81). A similar custom is widespread among the Yanomamö (Finkers 1986: 79; Barandiarán and Brändli 1983: 200; Cocco 1972: 188). Also the *Hoti* hunter, after the consumption of the edible parts of the head of the game (peccary), hangs up the skull on the tree in the settlement to augment his prestige and to secure future hunting success (Coppens 1983: 268). These examples suggest that the selected mammal bones took on the meaning of trophies. At the same time, these objects were loaded with numinous power that could positively influence future hunting.

Different neotropical mammals characterized by diverse behaviour qualities are represented by modified and unmodified bones from Dos Mosquises. However, wild cats make up 61% of MNI within these two categories. This predominance may suggest that bones of wild cats could have been chosen because these animals showed behavioural qualities that were desired by the Amerindian visitors to Dos Mosquises Island. These agile nocturnal predators, potentially dangerous to man, could symbolise such warrior-values as bravery and aggressiveness (see Linares 1977). However, it should be stressed that these small felines that can also be domesticated (see Civrieux 1980: 162 for domestication of ocelot

[*Felis pardalis*] by the Cumanagoto Indians), would mirror the human aggressiveness with lesser power than the big predators, such as jaguar (*Panthera onca*) and puma *(Puma concolor*).

It is noteworthy, that two anthropo-zoomorphic vessels recovered from Dos Mosquises site were decorated with toothed jaws. One of them is a probable representation of a bat and the other represents a face with two noses and large teeth enclosed within a big mouth. These iconographical expressions of ferocity are unknown in mainland Valencioid pottery, and are extremely rare in Venezuelan archaeology. A kind of meaningful link between these ceramic vessels and the numerous wild cats' mandibular remains, recovered within the same archaeological context, may be suggested.

To pursue the possible nature of this link, it should be explained that big wild felines, especially the jaguar and puma, were the mythological allies of the *Korupira* or *Kaapora*, the powerful and frightening 'master of the animals' of the Amazon Lowland tribes (Koch-Grünberg 1981-82[1924], vol. 2: 29; Zerries 1956: 9; Reichel-Dolmatoff 1968; Roe 1995a). When the Yukpa hunter (Carib speaking group from north-western Venezuela) confronted these felines, he believed that he was attacking the 'master of the animals' (Ruddle and Wilbert 1983). So, for many Amerindian groups the bones of these animals were especially loaded with meaning and power. A strong relationship between shaman and jaguar has been widely documented in native South America (Reichel-Dolmatoff 1975; Saunders 1989; 1998). Especially the Carib-speaking groups of Guiana, the so called 'Carib-Jaguars', possessed the supposed ability to transform themselves into jaguars (Wilbert 1987: 194). However, the same ability also possessed the shamans of the Carib-speaking Cumanagoto Indians from eastern Venezuelan coast (Ruíz Blanco 1965[1690]: 46). The skulls and cranial elements of the wild cats were often shaman's associated artefacts (Roe 1995a) and have been reported from different archaeological contexts (Reichel-Dolmatoff 1986: 186; Stahl 1995: 173). On the other hand, the aboriginal inhabitants of central-north Venezuela were warlike societies (see Chapter 4), since the war-related symbols would impregnate many of their activities, as well as material expressions.

The remains of crab eating fox (*Cerdocyon thous*) can also be linked to the presence of shaman(s) on this Island. Civrieux (1980: 160, 184), analysing the ethnohistoric sources referred to the practices of the Cumanagoto Indians from eastern coast of Venezuela, found that these nocturnal animals were considered as a spirits of the night and souls of the deceased persons. The name *Iboroco* was given to the protector spirit (or a grandfather) of all foxes, and the same name was also extended to the malefic demon *(demonio)* responsible for all the misfortune events of the Cumanagoto Indians. Foxes, as well as felines, being both nocturnal species, were probably the most important auxiliary spirits of Carib-speakers shamans, whose magic and curative activities usually required the conditions of darkness. The laymen could not face the spirits of darkness, only a shaman was 'equipped' to have dealings with them (Civrieux 1980: 185). In résumé, I can cautiously suggest that the feline and fox remains would be linked to the presence of shaman(s) and/or warrior(s) on Dos Mosquises Island.

The most pertinent ethnographic analogies for the Los Roques archaeological specimens are found in two Spanish chronicles from the 16th century, both of them primary eyewitness sources. The first described the dress worn for battle by the chiefs of the Carib inhabitants of the Península of Paria, Venezuela. Chief *Utuyaney* wore the skin of a jaguar (*Felis onca*) with its tail hanging on his chest; another chief *Amanatey* wore a complete skin of a honey bear (*Tamandua tetradactyla*) with its snout projecting over his head; other warriors wore different animal skins that the Spanish could not identify (Castellanos 1962[1589]: 39). Saignes (1954: 57), citing unidentified sources, stated that the Guarinos or Palenques, the Coastal Carib groups that lived to the East in the region of the Unare river, used the shell of an armadillo as a headdress. Given the contextual associations, as well as the exclusive presence of bones from the armadillo's shell at Dos Mosquises, it can be suggested that these remains did not represent food debris, but rather shells, that would have been used as personal headdress and/or as natural containers.

The second chronicle, written by Governor don Juan Pimentel, described the Province of Caracas in 1578 (Nectario María 1979; see Chapter 4). The Governor noted that the period of initiation of a young shaman (*piache*) ended with communal feast with dances and music, called *Ytanera*. The Governor continued that the Indians 'bring their garlands of coloured feathers or heads of animals such as pumas, bears, jaguars, small wild cats and their tails put on [fitted to] their heads' (translated by the author from the original version in Spanish published in Nectario María 1979: 342). Pimentel continued by saying that the Indians danced 'with masks...bringing some animals atop wooden sticks [decorated] with thread and colours' (Nectario María 1979: 339). The Governor explained that during these feasts the shaman (*piache*) was in contact with the spirits, and the Indians performed petitioner rites with offerings.

The skins of animals were used not only by participants in the feasts, in sacred/ritual contexts, but also by chiefs and prominent members of the group in secular contexts, such as the skins of jaguars worn by chief *Paramaconi* and his companion *Toconai* during a surprise attack by the Spaniards in the mountains of Caracas (Oviedo y Baños 1982[1723], vol. I: 264).

Despite the relatively late date of Pimentel's chronicle, in terms of the general chronology of the Spanish Conquest this still is a very early observation for the central-north region of Venezuela. By that time the conversion to Catholicism was in an embryonic stage. Given these circumstances, I consider that, regarding the *Ytanera* feasts that were closely linked to shamanic initiation, Pimentel described authentic Amerindian folklore, not yet tainted by the effects of the Spanish Conquest. I suggest that this evidence can be 'pushed back' into prehistoric times.

In conclusion, the archaeological evidence, reinforced by the ethnohistoric data, strongly suggest that the majority of mammal head remains should be grouped into the category of symbolic and polysemic objects utilized for ceremonial purposes. In particular, the skulls, mandibular fragments (these which are complete and with no use-wear) and phalanxes of wild cats seem to indicate that their skins were utilized at the Dos Mosquises campsite. As shown by the ethnohistorical data, prominent members of society used to dress themselves with the animal skins for ceremonial feasts and for battle. It can, therefore, be suggested that warriors and/or other prominent adult males of Valencioid societies such as chief and/or shaman, were present on Dos Mosquises Island.

It is known that the process of separation of a skull from the jaws using metal or stone implements usually leaves cut-marks on the mandibles (Noe-Nygaard and Richter 1990; van Wijngaarden-Bakker 1990; Semenov 1963). The mandible specimen (CN 609) from Dos Mosquises, lacks cut-marks, suggesting that it separated from the skull naturally during the postdepositional period, therefore supporting the hypothesis about the presence of skin(s) of wild cat(s) on the island. Alternatively, experimental and/or ethnoarchaeological data can refute this hypothesis since it is not known if the utilisation of bone or wood implements for the separation of skulls from jaws left any observable traces on the specimens. The Yanomamö Indians can use even a wooden projectile point for the extraction of the mandible of their game (see Cocco 1972: 260). On the other hand, the mandibular specimens which were broken-up, and probably represented hunting trophies, would have been utilized as votive offerings in the Dos Mosquises campsite.

It may be hypothesised that, reproducing on this island certain aspects of Valencioid ancestral rituals conducted by the shaman, the Amerindians performed petitionary rites there, addressed toward the protective spirits of the animals. During these ritual activities the Amerindians could have also deposited the votive offerings. Petitionary rites, as well as votive offerings, were often associated with hunting- and fishing-related activities, and were amply documented for Carib-speaking Cumanagoto Indians from the eastern coast of Venezuela (see Civrieux 1980).

I would argue that the rituals which accompanied the appropriation of marine resources were strongly rooted in the ancestral ritual complex developed for terrestrial hunting in the surroundings of the Valencia Basin. Such rituals developed by a society, whose hunting activities were oriented traditionally to the continental land game, would have been also embracing the *Strombus gigas* mollusc, the most coveted living creature of the insular environment.

Land shells

A total of 121 shells of three genera of land snails were recovered in four Valencioid insular sites and 10 units of excavation (Table 67). The representatives of the genus *Labyrinthus* Beck, 1837, have a mainland South American distribution, inhabiting areas ranging from near sea level to a maximum altitude of 7000 feet elevation (Solem 1966: 34, 37; Götting 1978). Both species of *Labyrinthus* described by Solem (1966: 57, 123) for Venezuela; *Labyrinthus plicatus* (Born, 1780) and *Labyrinthus leucodon* (Pfeiffer, 1847), were collected near Puerto Cabello, La Guaira and

TABLE 66. ***Landshells from Valencioid sites in Los Roques Archipelago.***

Taxon	Type of modification	DM Trench A	DM Trench B	DM Trench C	DM Trench E	KR	CS/D	CS/C	Total MNI
Camaenidae	Unperforated	-	-	2	-	1	-	-	3
Labyrinthus plicatus	Perforated: 1 conical perforation near the palatal lip	1	-	2	-	-	-	-	3
	Perforated: 1 punch hole near the palatal lip	1	5	9	1	2	-	-	18
	Fragments, small	(5)	(7)	(5)	-	-	-	-	(17)
Subtotal MNI		2(5)	5(7)	13(5)	1	3	0	0	24(17)
Bulimulidae	Unperforated	-	1	-	-	-	-	-	1
Plekocheilus spp.	Perforated: 1 small perforation near the aperture	2	10	3	-	-	13	-	28
	Perforated: 1 large punch hole near the aperture	-	3	2	-	-	-	-	5
	Perforated: 2 punch holes; 1 near the aperture and the other in the body whorl	4	8	1	-	-	-	-	13
	Perforated: 2 punch holes; one near the aperture and the other in the body whorl	-	2	-	-	-	-	-	2
	Perforated: 3 punch holes in the body whorl	-	1	-	-	-	-	-	1
	Perforated: 2 well finished perforations (a whistle?)	1	-	-	-	1	-	-	2
	Perforated: 3 well finished perforations (a whistle?)	-	1	1	-		2	-	4
	Large fragments; unknown number of eventual perforations	4	7	1	-	-	-	-	12
	Fragments of apexes*	2 ,	2	-	-	-	-	-	4
	Fragments, small	-	(6)	(4)	-	-	-	(1)	(11)
Subtotal MNI		13	35(6)	8(4)	0	1	15	(1)	72(11)
Stropho-cheilidae	Unperforated	-	-	-	-	-	1	-	1
	Perforated: 1 small punch hole near the aperture	1	-	-	-	-	3	-	4
Strophocheilus spp.	Perforated: 1 large punch hole near the aperture	-	2	-	-	-	-	-	2
	Perforated: 1 punch hole in the dorsal part	-	-	1	-	-	-	-	1
	Perforated: 2 punch holes near the aperture	-	-	-	1	-	-	-	1
	Perforated: 2 punch holes; one near aperture, other in the dorsal part	3	3	3	-	-	1	-	10
	Perforated: 1 punch hole in the dorsal part, other near the apex	3	-	-	-	-	-	-	3
	Perforated: 2 well finished perforations (a whistle?)	-	-	-	-		1	-	1
	Perforated: 3 well finished perforations (a whistle?)	-	-	-	-	-	1	-	1
	Perforated: 4 well finished perforations (a whistle?)	-	1	-	-	-	-	-	1
Subtotal MNI		7	6	4	1	0	7	0	25
Total MNI		22(5)	46(13)	25(9)	2	4	22	(1)	121(28)

* Apexes are counted as individuals (MNI). In brackets are given the quantities of fragments not counted for MNI. All three and larger digit numbers are catalogue numbers (except for totals).

Caracas, in heavily forested areas under logs and debris or in leaf mould near rocky ledges (Solem 1966: 123, 57). The habitats of two other land shells, genera *Plekocheilus* and *Strophocheilus*, are similar to the first species (Parkinson et al. 1987) indicating that all archaeological specimens might have been collected live on the mainland, within the region dominated by the Valencioid people.

The morphology of the majority of archaeological *Labyrinthus* spp. shells suggests they were used as pendants. Two *Plekocheilus* spp. and three *Strophocheilus* spp. shells have between two and four carefully finished holes; these specimens are considered as whistles or *ocarinas*. Each of the three multifunctional Valencioid sites (DM, KR and CS/D contained one of these instruments; however, the better elaborated one, with four holes, was found at DM (Trench B). These particular species of land shells may be considered as diagnostic elements of Valencioid insular sites. Two very small perforated shells of *Plekocheilus distortus* Bruguiere 1789 were found on the surface of the Ocumaroid site in Domusky Norte Island (DMN).

It should be emphasised that, except for one (#2238), all the *Plekocheilus* and *Strophocheilus* shells have modified columellar parts. Both species are edible molluscs (i.e. they are eaten by the aborigines from Sierra de Perijá, Roberto Lizarralde, personal communication 1985); however, neither their internal modifications nor multiple perforations are functionally related to flesh extraction. My suggestion is that all shells with one rough perforation near the aperture might have been brought as food, strung together with a rope. After eating the molluscs, some of the shells were modified to be converted into whistles or *ocarinas*; others might have been brought entire from the mainland, as indicated by unperforated specimens. It may also be suggested that still others might have been used as penis sheaths. However, according to the *Relación* of Governor Pimentel (1964[1578]: 125) the *Caraca* Indians used the bottle gourd for this purpose. Finally, some of these shells may have been used as lime for processing maize into *tortillas* and corn gruel, as *Pachychilus* spp. shells are used by modern Lacandon Maya (Nations 1979).

In the Trench B an average of 3.5 land shells were found in one cubic meter of archaeological deposit; in Trenches A and C these figures are 0.6. All land shells from Trenches A and B were found on the top of the archaeological deposits, which may suggest that they were carefully put there to avoid the crushing their fragile shells.

Lithic artefacts

A total of 161 lithic artefacts were recovered from Valencioid sites in Los Roques Archipelago; 130 (80.7%) of them come from DM site. They are discussed into three categories: polished (tools and adornments), chipped (tools debitage and waste) and coral and miscellaneous stone objects.

Polished stone artefacts

The DM site yielded 92.4% (N=49) of all polished stone artefacts from Los Roques Valencioid sites (Table 67). The CS/D and KR sites yielded a pendant and an axe each, morphologically related

TABLE 67. ***Quantitative distribution of stone artefacts in Valencioid sites in Los Roques Archipelago.***

Artefact categories	DM		CS/D		GR		KR		CA/A		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
Polished stone tools and adornments	49	38.2	2	7.4	-	-	2	100	-	-	53	32.9
Chipped and ground stone tools and preforms	37	28.9	7	25.9	-	-	-	-	-	-	44	27.3
Manufacture debris and various	44	34.3	18	66.6	1	100	-	-	1	100	64	39.7
Total	130	80.7	27	16.7	1	0.62	2	1.24	1	0 62	161	99.9

to DM specimens. 27 micro-axes were recovered in DM site. 18 (66.6%) of them are trapezoid, four (14.8%) rectangular, and five fragments pertain to axes of unidentified shape. The quantity of axes decreases with the distance from the seashore; 14 (51%) were found in Trench A, nine (33.3%) in B and only four (14.8%) in Trench C.

11 whole and seven fragments of flat, elongated pendants were found in DM; 66.6% (N=12) of them in Trench A. All pendants were made of epidote and serpentinite, except for one T-shaped specimen from Trench A that was made of rose-coloured quartzite.

It is outstanding that over 59% (N=29) of all polished artefacts come from Trench A. However, 34.4% (N=10) of them are broken. The use-wear was observed on 37% (N=10) of all axes and their fragments at DM; 50% (N=5) of them come from Trench A. The largest of DM axes (#1216), found in Trench A, has a V-shaped groove on its lateral side, indicating it was used as sharpener.

The lithic assemblage from Trench B shows some outstanding characteristics different from those from Trench A. All seven whole axes from this trench are entire specimens without use-wear and only two fragments of used axes were found. 71.4% (N=10) of axes and their fragments from Trench A were made of serpentinite, while every whole axe from Trench B was made of a different raw material. In total, eight types of a raw material were identified in DM lithic assemblages.

The quantities, qualities and contextual association of axes and pendants give little indication about their use/function. Both entire and used/broken axes and pendants from Trench A were found within three small cache-like clusters composed of ceramic vessels and figurines. They may have been used *in situ*, not used but deposited there, or brought already used, from other areas from or beyond the island. The physical integrity, lack of use-wear and variability of raw material in Trench B suggest that the polished stone may have had a votive character or had been deposited in the storage-like clustering for further use.

All used axes from Trench A, and one from B and C, show use-wear resulting from percussion, predominantly on butts. These artefacts may have been used for retouching *botuto* shell preforms, small-scale pendant and bead-making, and/or for pulverising burnt shells to obtain lime powder and/or mineral pigments (ochre). In Trench B, one axe shows attrition resulting from

TABLE 68. ***Quantitative distribution of stone artefacts in the DM site.***

Polished stone tools and adornments

Artefact category	Trench A				Trench B				Trench C				Total			
	c		f		c		f		c		f		c		f	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Axes	11	57.8	3	30.0	7	53.8	2	25.0	2	66.6	2	100	20	54.0	7	27.0
Pendants	5	26.3	7	70.0	3	23.0	-	-	1	33.3	-	-	11	29.7	7	46.6
Round bead	1	5.2	-	-	2	15.3	-	-	-	-	-	-	3	8.1	-	-
Various	2	10.5	-	-	1	7.6	-	-	-	-	-	-	3	8.1	-	-
Subtotal	19	65.5	10	34.5	13	86.6	2	13.3	3	60.0	2	40.0	35	71.4	14	28.5

Chipped and ground stone tools, chipping debitage and/or waste

Artefact category	Trench A		Trench B		Trench C		Trench D		Trench E		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
Chipped and ground stone tools and preforms	2	28.5	13	50	21	45.6	1	100	-	-	37	45.6
Chipping debitage and/or waste	5	71.4	13	50	25	54.3	-	-	1	100	44	54.3
Subtotal	7	8.6	26	32	46	56.7	1	1.2	1	1.2	81	99.9

c - complete artefacts; f - fragment.

polishing/abrading and two axes from Trench C show slight use-wear of unidentified origin on their bevelled edges.

Chipped stone tools, debitage and waste

84% (N=37) of chipped stone tools were found in the DM site; 56.7% (N=21) of them in Trench C (Table 70). Eight different types of tools were identified: percussor, grinder, grinder-percussor, scraper, perforator, smoother, polisher and anvil.

64% (N=16) of all percussors come from Trench C and account for 88.8% of all tool types found in this trench. These data indicate that stone percussors were involved in *botuto* shell processing, more specifically in lip detachment. All tool types found at DM were recovered from Trench B, except for one. This functional richness confirms previous hypothesis about the multifunctional character of activities carried out in this area.

The DM site yielded 68.75% of all chipping stone debitage and waste recovered in Los Roques Valencioid sites; however, a relatively large quantity of this was found in the CS/D site (28%). 86.3% (N=38) of these artefacts are small and medium sized quartz flakes that had been struck from large cobbles. This also suggests that quartz tools, which account for 17% (N=37) of all chipped stone tools in DM, may have been chipped in situ while the tools from other materials were brought from the mainland already finished. Some of flakes from Trenches B and C show cortex which indicates that they may have been manufactured *in situ*. A few flakes may have been used for scraping/cutting soft material and were not merely chipping debitage or waste.

TABLE 69. ***Polished stone artefacts from DM, CS/D and KR sites.***

Artefact	Morphology/ description	Raw material[3]	Metrical attributes[1] a	b	c	d	Catalogue number	Observations[2]
			Trench A, level 0-20 cm					
Axes								
Trapezoid	Complete	Amphibolite	5.3	3.1	2.0	52.5	1209	Use-wear on the butt
	Complete	Serpentinite	6.9	3.9	1.9	37.5	1216	No use-wear, longitudinal groove
	Complete	Epidote	4.7	2.7	0.9	45.0	1223	No use-wear
	Complete	Serpentinite	4.3	2.2	0.8	30.0	1212	No use-wear
	Complete	Serpentinite	6.4	3.6	0.8	56.0	1215	No use-wear
	Complete	Serpentinite	4.0	2.2	1.0	37.5	1224	Percussion use-wear on butt and lateral edge
	Complete	Serpentinite	6.3	2.4	1.4	37.0	1225	No use-wear
	Complete	Serpentinite	5.4	3.4	0.9	30.0	1213	Use-wear by bipolar action in both ends
	Complete	Serpentinite	4.9	3.1	1.6	-	*	No use-wear
	Complete	UID	5.7	2.9	1.2	-	*	Use-wear on the butt
	Semi-complete	Serpentinite	4.3	2.5	0.9	22.0	1214	Use-wear on butt and longitudinal exfoliation on face
Rectangular								
Axe fragment	Complete	Serpentinite	3.2	1.0	0.6	30.0	1203	No use-wear
	Semi-complete	Epidote	7.1	-	1.3	53.0	1206	Broken in distal zone
	Lateral fragment	Serpentinite	3.8	2.1	1.0	-	1075	-
Pendants								
Rectangular symmetric	Complete; perforation medial, biconical, superior	Epidote	10.0	1.9	0.4	-	1196	Second perforation unfinished
	Complete; as above	Serpentinite	8.8	1.2	0.3	-	1195	-
	Complete; as above	Serpentinite	4.5	1.3	0.2	-	1219	Second biconical perforation unfinished
Elliptic symmetric	Complete; not perf.	Serpentinite	7.3	1.3	0.31	-	1194	-
	Complete; perf. medial biconical superior	Epidote	4.7	1.7	0.13	-	1221	-
Elliptic asymmetric	Matrix, unifacially polished , not perf.	Serpentinite	9.9	1.6	0.15	-	1193	Fracture on one edge
	Lateral fragment	Epidote	3.6	1.2	0.66	-	1202	-
	Lateral fragment	Epidote	4.2	1.6	0.3	-	1205	-
	Lateral fragment	Serpentinite	4.9	1.6	0.41	-	1218	-
Elongated form	Medial fragment	Serpentinite	4.0	0.7	0.33	-	1119	-
	Medial fragment	Serpentinite	4.6	1.4	0.26	-	1204	-
T-shaped, symmetric	Fragmented, perforated	Pink quartzite	3.6	3.0	0.80	-	1240	-
Round bead	Complete, two central perforations, conical	Quartzite?	1.8	1.7	-	0.4	196	Polished; two conical perf. on one side finish in one on the other side
Various								
Polisher or axe preform	Complete	Amphibolite	6.0	2.5	0.7	-	1246	No use-wear
Partly polished flake	Complete	Serpentinite	2.9	0.9	1.0	58	1200	Edge polished in its lateral extreme
			Trench B, level 20-40 cm					
Axes								
Trapezoid	Complete	Hornblendite Metadiabase	4.3	3.0	1.6	52.0	1250	No use-wear
	Complete	Gabbro Metadiabase	4.5	2.5	1.0	45.0	1211	No use-wear
	Complete	Epidote	4.3	2.4	1.0	57.0	1222	No use-wear
	Complete	Serpentinite	4.1	0.9	0.5	30.0	1201	No use-wear
	Complete	UID	4.8	3.1	1.1	22.0	7371	No use-wear
Rectangular	Complete	Quartz	5.1	3.2	1.1	22.0	1245	No use-wear
	Complete	Limonite	5.4	1.9	1.2	60.0	1729	No use-wear
Axe fragment	Fragment	Serpentinite	6.5	2.9	1.9	-	1207	Polished sectors, groove from abrasion
	Distal fragment	UID	3.0	2.8	1.4	52.5	1189	Butt missing, percussion wear on distal edge

Pendants								
Rectangular asymmetric	Complete; perforation medial, biconical superior	Epidote	10.2	1.9	0.5	-	1197	Second biconical perforation unfinished
	Complete; as above	Serpentinite	3.9	0.8	0.1	-	3171	-
Elliptic symmetric	Complete; as above	Epidote	7.0	1.3	0.25	-	1220	-
	Complete; one central biconical perforation	UID	1.0	1.0	-	0.4	187	-
Round bead	Complete; one central biconical perforation	Quartzite	0.7	0.7	-	0.4	189	-
Various								
Polisher	Complete	Gabbro Metadiabase	3.1	3.2	1.1	-	1188	Negatives of percussion anterior to the use as abrader
			Trench C, level 20-40 cm					
Axes								
Trapezoid	Complete	Serpentinite	5.7	2.3	0.5	30.0	710	Slight use-wear on the edge
Axe fragment	Complete	Metadiabase	4.0	1.6	1.0	30.0	1234	No use-wear
	Distal fragment	UID	4.0	2.2	1.0	-	1075	One side absent; use-wear on the edge
Axe fragment	Proximal fragment	UID	3.9	3.6	2.5	-	1649	Use-wear of percussion in the butt
Pendants								
Rectangular symmetric	Complete; perforation medial, biconical superior	Epidote	10.1	2.4	0.4	-	782	-
			CS/D site, Trench A, level 20-40 cm					
Axe	Distal fragment	Serpentinite	4.5	3.1	1.2	38	1006	Butt absent; no use-wear
Pendant	Lateral fragment	Epidote?	5.9	1.3	0.3	-	930	-
			KR site, Trench A, level 20-40 cm					
Trapezoid axe	Complete	Amphibolite	5.0	3.2	0.9	62	974	Little use-wear on butt and one edge
Pendant	Matrix, fragment	Serpentinite	7.3	2.1	0.4	-	1193	Fracture produced during the perforation

1.Metrical attributes: in cm. Codes and abbreviations: a - maximum length, b - maximum width, c - midpoint thickness, d - bevel angle. 2. Petrography by Giselle Gedler, MARAVEN, Caracas, Venezuela. 3. Morphology and functional analyses by Arturo Jaimes, Museo Arqueológico de Quibor/ Fundación La Salle, Venezuela. * Artefacts lost in the UCV, since 1982.

Finally, 52 very small flakes or microliths (length<10 mm) of quartzite and chert were also found. 32 (61%) of them come from Trench B, the rest from Trench C. The macroscopic analyses of these microliths has not yet been performed since they are still in the petrographic laboratory. Some of these chips may have been hafted in wooden handles and used for cutting, scraping and/or piercing soft materials. They may also be the remains of grater teeth used to rasp bitter manioc tubers (see Haviser 1991: 42; Rostain 1997: 235). This last hypothesis may be strengthened by the presence of three fragments of ceramic griddles (*budares*) in the DM site. One fragment was found in Trench C, one in E and the last in a shovel test pit (#27) located 7 meters south-west of Trench C. This evidence may suggest that manioc cakes (*casabe*) were consumed, but only marginally, by Dos Mosquises Valencioids. It should, however, be emphasised that griddles are not exclusively associated to bitter manioc culinary processing but may also indicate that maize was processed for food (see De Boer 1975).

TABLE 70. ***Chipped stone tools from DM and CS/D sites.*** *

Artefact	Mineral	a	b	c	Cat. #	Observations
		DM site, Trench A, level 0-20 cm				
Percussor	Crystal of quartz	9.6	2.7	2.4	1198	Use-wear from pecking on both extremities
		DM site, Trench A, level 20-40 cm				
Percussor	Aplite-Trondhjemite	12.2	8.4	5.0	2662	Pebble used on one of its edges; negatives of primary flake by use
		DM site, Trench B, level 0-20 cm				
Percussor/grinder	Amphibolite	9.4	5.7	4.9	2138	Used as percussor on one side and as percussor on the other; shows splitting produced by use
Polisher, cylindrical fragment	Quartz	1.9	1.1	0.9	1244	Use-wear on one of its borders
Scraper	Metaquartzite	5.6	4.1	1.1	3439	Made out of small flake
		DM site, Trench B, level 20-40 cm				
Smoother?	Quartz	5.2	4.1	2.1	3453	Made out of pebble
Grinder	Metaquartzite	10.4	5.5	4.2	2957	Use-wear on one of its apexes
Axe preform, matrix	Rhyolite-Dacite?	9.1	6.5	1.5	3565	Formatted by marginal percussion
Percussor	Quartz	12.7	8.7	4.5	2956	Use-wear on one of its edges
Percussor	Amphibolite	13	6.9	8.7	2158	Use-wear on one of its edges
Percussor	Gabbro Metadiabase	10.4	7.9	6.4	2951	-
Percussor	Quartz	8.5	9.2	5.1	2137	Pebble with splitting on its distal end
Percussor (fragment)	Gabbro Metadiabase	9.2	6.6	5.4	2152	Use-wear on one of its edges
Percussor	Quartz	5.1	7.6	1.9	2960	Primary flake used to strike in one sector
Perforator (lateral fragment)	Quartz				2961	Made out of medium-sized flake
		DM site, Trench C, level 0-20 cm				
Percussor	Andesite	11.6	6.7	4.8	2143	Use-wear on one edge
		DM site, Trench C, level 20-40 cm				
Anvil?	Quartz	12.1	10.2	8.7	2175	Pebble used as anvil; could be moderately exposed to fire
Percussor	Quartz	7.2	4.0	3.0	897	Pebble with primary splitting on one edge, produced probably by pecking
Percussor	Fine-grained sandstone	13.2	8.0	4.7	826	Used on one extremity which shows multiple splitting
Percussor	Gabbro Metadiabase	13.2	9.9	5.1	1608	Used on various of its edges
Percussor	Fine-grained sandstone	13.2	8	4.7	826	Use-wear on one of its ends; multiple splitting
Percussor (fragment)	Amphibolite	9.5	8.1	4.6	2146	Fragment used as percussor; shows splitting on its active edges
Percussor	Gabbro Metadiabase	11.4	9.6	4.0	2164	Use-wear on two of its edges. The raw material can be found at La Mata (VLB) in form of laminae
Percussor	Gabbro Metadiabase	9.6	7.1	4.0	2139	Use-wear on various of its edges
Percussor	Gabbro Metadiabase	11.5	7.5	5.0	1068	Use-wear on one edge
Percussor	Gabbro Metadiabase	12.6	7.2	7.4	2162	Use-wear on one of its apical edges
Percussor	Gabbro Metadiabase	15.4	8.2	8.4	2165	-
Percussor	Quartz	6.5	5.2	3.9	3444	Use-wear on one of its apical edges
Percussor (distal fragment)	Quartz	6.0	4.2	2.3	3566	Medium-sized flake
Percussor (fragment)	Amphibolite	8.0	4.2	1.4	3568	Medium-sized flake
Percussor	Quartz	7.2	4.0	3.0	897	Pebble with primary splitting on one end, product of pecking
Percussor	Meta-toba	7.7	8.1	5.5	3451	Clast with negatives produced by pecking
Perforator (basal fragment)	Quartz	5	3.5	1.7	3050	Made out of medium-sized flake; heat attrition of its acute apex
Polishing tool (cylindrical fragment)	Quartz	1.9	1.1	0.9	1243	Shows use-wear on one edge
Preform/bifacial fragment	Quartz	5.4	5.4	2.9	830	Shows marginal bifacial flaking

TABLE 70. (cont.)

Artefact	Mineral	a	b	c	Cat. #	Observations
			DM site, Trench C, level 40-60 cm			
Percussor	Amphibolite	11.9	9.7	5.5	2156	Use-wear on both extremities
			DM site, Trench D, level 0-20 cm			
Percussor	Gabbro -Metadiabase	11.7	6.8	6.9	2776	Use-wear on three of its apexes
			CS/D site, Trench A, level 0-20 cm			
Percussor	Pink quartz	6.9	6.3	5.6	3003	-
Preform/bifacial fragment	Quartz	5.5	3.0	3.0	2380	-
Scraper, lateral	Quartz	5.1	5.1	1.2	1895	Made of medium-sized flake
			CS/D site, Trench A, level 20-40 cm			
Percussor (fragment)	Quartz	4.4	4.4	3.8	1005	Made of medium-sized flake
Plane form/bifacial fragment	Quartz	3.3	3.9	1.3	3083	-
Scraper	Quartz	3.1	2.2	0.8	2806	Made of medium-sized flake
Scraper, lateral	Quartz	5.5	8.5	2.0	4511	Made of medium-sized flake

* Morphologic and functional analysis by Arturo Jaimes, Museo Arqueológico de Coro. Petrologic analysis by Giselle Gedler, Maraven SA. Metrical attributes in cm. Codes and abbreviations: a - maximum length, b - maximum width, c - thickness at maximal medial point; Cat. # - catalogue number.

Coral artefacts and miscellany

101 artificially modified corals, probably *Acropora palmata*, were found at DM. These corals are a common component of Los Roques Archipelago reefs (Hung 1985). As a raw material they were almost surely brought from the storm terraces on the southern shore of DM Island, where piles of dead corals of different species, shapes and sizes can be found.

Two oval-shaped medium-sized artefacts, abraded by use on all sides, were used possibly as *manos* for grinding maize and/or salt. They were found in a refuse area, beyond the western border of the cluster of artefacts, in Trench B. Two fragments and one whole *metate* were found in Trenches B and C. One is a flat fragment of coral 34 cm long, 17 cm wide and between 4.3 and six centimetres thick. It has an oval-shaped concavity in the centre produced by grinding. In its central point the concavity is 3.1 cm deep. This *metate* was made out of relatively soft material, in comparison to true stones, therefore when the distance between the bottom of the used surface (concavity) and the bottom of the artefact reached 1.8 cm in thickness; as a result the whole *metate* broke into two halves. The *metate* was found associated to fish remains, *botuto* shells and potsherds outside the cluster of artefacts of Trench B. Its second half was not found.

The second, lateral fragment of *metate* was found in Trench C. It has a maximum dimensions of 31 by 18 and a thickness of 4.1 cm. A part of 3.8 cm deep concavity resulting from grinding is visible. When entire, this second metate was thicker and larger then the first one. It was associated with food debris and potsherds.

TABLE 71. *Chipped stone debitage and waste from DM, CS/D, GR and CA/A sites.*

Artefact	Mineral	a	b	c	Catalogue number	Observations
			DM site, Trench A, level 0-20 cm			
Flake, small	Chert quartz	1.4	1.7	0.8	1239	-
Flake, small	Crystal quartz	2.5	3.0	1.3	1244	-
Flake, very small	Serpentinite	1.2	2.5	0.9	1235	-
Flake, very small	Quartz	1.9	1.6	0.8	1240	-
			DM site, Trench A, level 20-40 cm			
Pebble	Amphibolite (granithic)	10.8	8.1	9.0	2159	-
			DM site, Trench B, level 0-20 cm			
Core	Quartz	6.0	5.8	2.9	3442	-
Flake, medium-sized	Quartz	4.9	2.8	2.4	3440	Fragment of pebble; exhibits cortex
Matrix	Quartz	7.4	6.3	4.0	3443	-
			DM site, Trench B, level 20-40 cm			
Clast	Quartz	-	-	-	1236	-
Clast	Quartz	-	-	-	3300	-
Flake, small	Quartz	6.0	4.3	1.9	3108	Fragment of pebble
Flake, small	Quartz	4.6	4.0	2.2	7370	-
Flake, medium-sized	Quartz	4.2	7.1	1.8	2963	-
Flake, medium-sized	Quartz	4.9	7.1	1.0	2962	Exhibits cortex
Flake, small	Quartz	2.4	1.6	0.9	7381	-
Flake, small	Quartz	3.9	5.2	1.8	3438	-
Flake, very small	Quartz	2.9	2.5	0.8	3535	-
Flake, very small	Quartz	2.3	1.3	0.6	7373	-
			DM site, Trench C, level 0-20 cm			
Flake small	Quartz	4.6	2.9	2.0	1840	-
Flake small	Quartz	2.9	3.4	1.5	2913	-
			DM site, Trench C, level 20-40 cm			
Clast	Amphibolite	4.4	3.9	2.4	903	-
Clast	Quartz	-	-	-	1242	-
Core	Quartzite	8.8	8.2	5.6	2145	Pebble reduced on one of its faces
Core	Meta-quartzite	9.6	5.7	4.9	3459	-
Flake, medium-sized	Amphibolite	7.2	6.0	4.1	2147	-
Flake, medium-sized	Quartz	3.6	8.1	2.7	2169	Fragment of pebble
Flake, medium-sized	Quartz	6.8	7.3	3.6	2136	Fragment of core
Flake, medium-sized	Quartz	3.8	4.1	3.2	3454	Fragment of core; exhibits cortex
Flake, medium-sized	Meta-quartzite	7.9	5.7	2.4	3445	-
Flake, small	Quartz	4.2	4.2	1.2	830	-
Flake, small	Quartz	4.6	4.1	1.2	1839	-
Flake, small	Quartz	4.0	4.6	1.8	903	-
Flake, small	Quartz	2.2	3.4	1.6	1838	-
Flake, small	Quartz	3.2	1.7	1.4	1830	-
Flake, small	Quartz	2.1	3.3	1.3	3447	-
Flake, small	Quartz	3.2	4.1	0.9	1842	-
Flake, small	Quartz	2.8	4.5	1.2	2262	Fragment of pebble
Flake, small	Quartz	3.6	2.8	1.2	3446	Fragment of pebble
Flake, small	Amphibolite	3.9	5.8	1.6	898	-
Flake, small	Quartz	4.7	3.0	0.9	3452	-
Flake, very small	Quartz	2.2	2.9	1.1	1831	-
Matrix	Amphibolite	12.1	7.1	5.3	2140	-
Flake, medium-sized	Quartz	6.2	5.9	2.6	1837	-
			DM site, Trench E, level 20-40 cm			
Flake, small	Quartz	4.0	5.6	1.5	2935	Exhibits cortex

TABLE 71. (cont.)

Artefact	Mineral	a	b	c	Catalogue number	Observations
			CS/D site, Trench A, level 0-20 cm			
Flake, medium-sized	Quartz	4.5	5.9	2.5	2379	-
Flake, medium-sized	Quartz	3.2	7.8	2.0	2381	-
Flake, medium-sized	Quartz	8.7	8.3	2.0	2377	Fragment of pebble
Flake, small	Quartz	4.2	4.6	1.2	2378	-
			CS/D site, Trench A, level 20-40 cm			
Flake, small	Quartz	4.7	4.2	1.9	3189	-
Flake, medium-sized	Quartz	4.8	7.4	3.2	4512	-
Flake, small	Quartz	4.3	4.3	1.2	3090	-
Flake, small	Quartz	3.6	1.6	1.6	3085	-
Flake, small	Quartz	4.0	4.7	0.9	4513	-
Flake, small	Quartz	2.4	2.7	1.1	3084	-
Flake, small	Quartz	4.7	2.8	0.9	2678	-
Flake, small	Quartz	2.8	3.8	0.8	1757	-
Flake, small	Quartz	3.2	3.5	1.4	2679	Shows very small negatives
Flake, small	Quartz	3.3	2.6	1.0	2677	Shows very small negatives
Flake, small	Quartz	3.4	4.8	1.1	4510	-
Flake, small	Quartz	2.3	2.9	1.2	3106	-
Flake, small	Quartz	4.7	4.0	1.6	3088	-
Flake, small	Quartz	2.9	5.0	1.5	3089	-
			GR site, Trench A, level 0-20 cm			
Matrix	Amphibolite	10.7	4.9	2.9	2532	-
			CA/A site, Test pit 1, Level 20-40			
Flake, medium-sized	Quartzite	6.3	3.2	3.6	764	Fragment of core; exhibits cortex

Morphologic and functional analysis by Arturo Jaimes, Museo Arqueológico de Coro. Petrologic analysis by Giselle Gedler, Maraven SA. Metrical attributes in cm. Codes and abbreviations: a - maximum length, b - maximum width, c - thickness at maximal medial point.

A third specimen seems to be a *metate* abandoned in its early stage of use. It is 47.5 cm long, 35.5 cm wide and 6.1 cm thick flat coral stone. The centre of one of its flat surfaces is barely abraded. It was found in a test pit 2.5 m east from the first *metate* fragment. It was associated with potsherds, fish and turtle remains and *botuto* shells. This could be the successor of two other discarded *metates*.

It is striking that no hard stone *metates* or *manos* were found in Valencioid deposits. Was the selection of coral as a raw material strictly guided by a practical reason, i.e. not to transport too heavy items in the canoes? Were they used to grind maize or other products such as marine salt, burnt shells for lime powder and/or pigments (ochre)? Even if I assume that the coral *mano* and *metate* are not as efficient or durable as their stone counterparts, I cannot determine whether they were used for maize grinding or not. What may be said is that the evidence indicates that maize and/or bitter manioc was processed for flour in DM site. If coral *manos* and *metates* were used exclusively for grinding marine salt and shells, then the choice of raw material of marine origin may have obeyed unknown ideological patterns rather than practical reasons.

One rectangular flat fragment of large coral was found in the centre of the cluster of artefacts in Trench B. It served as a base on which ceramic vessels were found. It shows no intentional modification except for one broken edge. Three smaller, artificially broken rectangular fragments of coral that may have served similar purposes were found in Trench E, in a refuse area. Trench C yielded 68 small and medium sized fragments of coral stones, all of them artificially broken. 11 of them were heat-affected indicating that they may have served as hearth bases. However, only one well defined hearth base made of 24 coral stones was located in Trench A.

One large, flat metamorphic rock was accidentally found at a depth of 20 cm, about 30 meters north from Trench D (Juan Manuel Posada, personal communication 1988; Figure 30, feature M). It is discussed separately from other stone artefacts since there is no assurance about its Amerindian origin. Both flat surfaces of the artefact were abraded, possibly as a result of grinding. In the radius of 2-3 meters from the spot where the artefact was found there are shallow (x<25cm) scatters of whole and broken *botuto* shells, patches of fish and turtle bones and sparse potsherds. The sand is grey, containing burned particles. These remains, and probably also the artefact in question, pertain to a culturally unidentified, 'pre-Valencioid' component.

Two unmodified fragments of hematite from Trench B show a mass of specular crystals (see Pellant 1995: 80). The third is artificially altered and interpreted as a lateral scraper, possibly used to work vegetal fibre (Arturo Jaimes, personal communication 1994). All these artefacts were found within the cluster of ceramic, bone and shell artefacts. One elongated fragment of impure native iron oxide or ochre was found in Trench A, also within the cluster of artefacts. One edge of this specimen was cut off or scraped away. It is probable that this earthy hematite was used as a red pigment for body painting.

In conclusion, the direct use of stones with or without moderate modification suggest an effective management of time investment by Dos Mosquises Valencioids. Tools were not elaborate but highly specialised, destined basically for hammering and pecking shells. All stone was brought from the mainland where the raw material is easily available in the Cordillera de la Costa. The serpentinite is the only exotic material that was probably imported from the Venezuelan Andes, Guajira Peninsula or La Orchila Island (Wagner and Schubert 1972). No evidence for exploitation of serpentinite from the interior of La Orchila Island (see Schubert 1976: 1131) was found, nor do the rocks of Gran Roque Island seem to have been exploited.

Searching for comparable specimens

In north-central Venezuela numbers of different types of polished stone artefacts were recovered. However, only a few came from systematic excavations. The early reports by Marcano (1971[1888-92]), Ernst (1871), Jahn (von den Steinen 1904) and Oramas (1917) describe celts and pendants which were found in the Valencia Basin, Valley of Caracas and on the Central Coast. They were predominantly associated with the Valencioid sites. The majority of these artefacts were not accurately measured or lack contextual data.

TABLE 72. *Stone tools and debitage from Valencia-related sites of the central-western coast.* *

Artefact category	Puerto Maya	Playa Chuao	La Cesiva	Cueva del Otro Lado	Sinamaica	El Paraiso	Cepe	Total
Debitage (primary and secondary flakes)	48	49	-	-	-	-	-	97
Axe	10	4	4	1	1	3	2	25
Scraper	16	4	-	-	-	-	1	21
Cores	14	-	-	-	-	-	-	14
Percussor	4	-	-	-	-	-	-	4
Mano	-	1	-	-	2	-	-	3
Knives	-	2	-	-	-	-	-	2
Net sinker	-	1	-	-	-	-	-	1
Total	92	61	4	1	3	3	3	167

* Compiled from Martín 1995.

Martín (1995) made morphological and functional analyses of 165 lithic tools and debitage from Valencia-related sites on the central-western coast of Venezuela. This inventory includes artefacts obtained in systematic excavations and surface collections and recovered from different types of natural environments (including caves). These artefacts certainly come from diverse sites in terms of function, occupational intensity and time. In consequence, the results of comparative analyses of quantitative and qualitative distribution of tool types between coastal sites and absence/presence statistics offer limited insights into the socio-economy of ancient systems. For example, the overall absence of perforators and *metates*, as well as low frequency of percussors and the high frequency of axes may be a result of recovery biases and/or functional differentiation of the sites. However, it is striking that only two axes from Puerto Maya may be related to DM specimens on the basis of their small size and lack of use-wear. A fragment of a similar micro-axe came from Playa Chuao site (Martín 1995: 209, 212). One axe/sharpener, morphologically similar to specimens from DM, was found in Playa Chuao (Martín 1995: 212).

The DM axes are made from far more diverse raw material than the mainland specimens. 12 coastal axes were made of jadeite (see Martín 1995), eight of amphibolite, four of serpentinite and one of quartzite. Besides these raw materials, the DM specimens were also made of epidote, hornblendite metadiabase, limonite and gabbro metadiabase. The small size, lack of use-wear and diversity of raw material of insular specimens stand out when compared to their mainland counterparts.

Requena (1932: 135) found several polished axes of diverse sizes on the eastern shore of Lake Valencia. He stated that they were made of granite and jade. He also excavated elongated pendants similar to these from Dos Mosquises Island (Requena 1932, Figure on page 157, specimens 2-5 from the top of the page). However, all of these pendants have two medial superior perforations instead of the single one characteristic of the DM specimens. Dozens of polished stone artefacts were found by Requena in burial contexts. Unfortunately they are 'hidden' behind vague labels such as 'war or industrial axes', 'knives' or 'symbolic pendants', and no metrical attributes, use-wear and contextual are provided (Requena 1932: 269, 272, 276, 299, 301).

Osgood (1943: 37-38) excavated 21 celts in the mound in Tocorón; 12 of them were made from 'dark green porphyry' and some of 'fine green schist'. One trapezoid celt resembles common forms of DM specimens (Osgood 1943: Plate 13, G). The maximum length of all Osgood's celts varies between 6.5 and 18 cm, which implies that the smallest of his celts is as long as the longest of the DM axes. It is noteworthy that four pieces of ochre of irregular form, similar to the DM specimen, were found in Tocorón Mound (Osgood 1943: 39).

Bennett (1937: 124; Fig.16, 3, 4) found 47 celts, mainly in the upper part of the La Mata mound. Some of them morphologically resemble the specimens from DM; however, the smaller of Bennett's complete specimens (Fig.16, 4) is over eight centimetres in length, which is two centimetres more than the maximum length of the longest DM celt. Bennett (1937: 124; Fig.16, 3, 4) also found five complete and two fragments of so called 'bat wing' thick pendants. They have triangular extension of superior medial edge where the perforation for suspension is situated. The insular specimens lack this extension and have straight, parallel edges.

Kidder (1944: 72-73) found 47 polished stone celts in the Península de La Cabrera. They were predominantly trapezoid in form and 27 of them have heavy use-wear and average length of 15 cm. 20 were 'small' whole celts whose length ranged from five to nine centimetres, indicating that they are, in general, still larger than the DM micro-axes. The small specimens were made of metamorphic diorite, tuff and 'slaty rock' (Kidder 1944: 72-73). It is noteworthy that 'humus deposits [Valencia Phase] of all trenches [in the La Cabrera site] produced only five large celts, broken or unbroken'. The small celt stratigraphic distribution is reversed: only one, unworn specimen was found in an burial, in La Cabrera Phase levels, while 19 worn celts were associated with upper Valencia Phase deposits (Kidder 1944: 73). Kidder suggested that the low abundance of large celts in the Valencia Phase may account for lack of 'specialisation', without giving clue what kind of specialisation he had in mind. My guess is that if the large celts were used for clearance of the woods and for horticultural purposes, so it may reasonably be expected that the first settlers, the bearers of Barrancoid pottery, had to use them much more frequently than their successors. Kidder supposed that the smaller celts were not 'hafted for use as hatchets' even though their shape is very similar to that of the large specimens (Kidder 1944: 72). He further hypothesised that these small celts would have been used as scrapers or chisels, given the lack of chipped stone and bone scrapers in the site. It is also noteworthy that one small celt made of nephrite, without use-wear, was found in an urn burial (Kidder 1944: 73, 51, Pl. I, 5; Fig. 16, 6). Only one pendant made of 'impure limestone', similar to Bennett's 'bat wing' pendants with central triangular element and biconical hole, was recovered from the lower, La Cabrera Phase, deposit (Kidder 1944: 71, Pl. 11, 30).

Kidder (1944: 73) emphasised that no true *metate* was found in La Cabrera nor in any other Valencia Basin site, and suggested that 'food grinding on stone played a minor part in the lives of the Lake Valencia Indians'. The lack of *metates* and scarcity of *manos* in VLB and on the coast may indicate that maize was ground on fixed grinders, was consumed entire and roasted and/or played a marginal role in Valencioid diet. These data may also strengthen the hypothesis that DM coral *metates* may have been used for tasks other than maize grinding.

It is interesting that Berry (1939: 558) reported relatively abundant corals in a surficial Valencioid deposit in La Cabrera site believing they were used for 'shredding manioc (cassava)'. This evidence indicates that corals were imported from reduced coastal reef areas or from Los Roques Islands, in the latest period of Valencioid occupation of the site.

Except for double-holed pendants recovered by Requena, no polished stone pendants comparable to insular specimens were reported from the Valencia Basin. The only similar ones were found outside north-central Venezuela, on Cubagua Island, close to Margarita Island. Cruxent and Rouse (1958, vol. 2, Pl. 13: 1, 2, 9) described three pendants found in the early 16th century Hispanic town of Nueva Cádiz. They range between 9 and 4.7 cm in length and at least one of them seems to be made of serpentinite. Rouse and Cruxent (1963: 135, 138) suggested that part of the Amerindian artefacts found in Nueva Cádiz site came with the Indian slaves who had been brought by Spaniards from all over the Caribbean, to work in the pearl fisheries. Given the presence of Valencioid pottery in this site (Rouse and Cruxent 1963:138), it is highly probable that the enslaved bearers of this pottery would have brought the pendants with them. These data are an indicator of late prehistoric/protohistoric production and/or use of stone pendants similar to those recovered in the Dos Mosquises site.

In conclusion, the Valencia Basin sites yielded many polished stone celts; however, the majority of them were considerably larger and more worn than the insular specimens. The small axes and pendants were often associated with burials. Many more micro-axes without use-wear, and made of more diversified raw material, were found in Trench B at the DM site than in all above described continental sites. Such high spatial concentration of non-utilitarian, special purpose lithic artefacts may be indicative of the votive character of their deposition on remote Dos Mosquises Island.

Part Three

Back and forth from the islands

Chapter Nine

Concluding discussion

In this chapter I discuss selected results of the analyses presented in earlier sections of the dissertation in order to shed light on the social organisation, economy and ideology of the insular Valencioids, and to explore their macro-regional connections. The outcome of this concluding discussion may, perhaps, fall short of expectations for two reasons. Firstly, to achieve an integrated perspective, analyses of the non-ceramic evidence should be complemented by the study of pottery from the same temporo-spatial frames (Hodder 1986). In this respect, my research has been conceived as a point of departure for any future ceramic analyses (see the forthcoming PhD thesis of Marlena Antczak, who discusses the pottery from Valencioid insular sites, and especially explores the social meaning of hundreds of pottery figurines found at DM).

The second limitation lies in the fact that the understanding of the nature and dynamic of a society(ies) that operated in a peripheral area (i.e. the insular Valencioids), cannot be achieved without comparable understanding of the societies in the core region, their socio-political realities and a whole historical context in which both operated (see Wallerstein 1974). Throughout this study I have often referred to the mainland sites and archaeological specimens, comparing them with their insular counterparts. This was done in order to anchor the insular non-ceramic artefacts (both culturally and chronologically), independently of results derived from comparative analyses of the pottery (a task to be performed by M. Antczak). In consequence, I roughly identified the cultural origin of the insular material, but did not address the questions of the exact social identity of their producers/users. I refrained from making specific social identifications on the mainland because the normative concepts of 'style' and series' (as set out in Cruxent and Rouse 1958) were never meant to represent social units, much less to distinguish among ethnic groups and polities. Those archaeologists who used the concept of culture (not to be equated with society) were explicitly dedicated to the analyses of the norms exhibited in material culture (mainly in ceramic and lithic artefacts). They were cognisant that their approach (and data base) restricted access to sociological and/or behavioural realms (i.e. Cruxent and Rouse 1958). This caution was not observed by certain scholars who claimed to establish dynamic models of socio-economic and socio-political interactions in north-central Venezuela, on the basis of artefact-oriented studies (Sanoja and Vargas 1974; Vargas 1990). Their inferences about regional political economy were drawn from inadequate and insufficient samples of archaeofaunal and environmental data. Handfuls of potsherds, gathered from the surface stood, in some cases, for whole settlements and were integrated into 'dynamic' models of political-economical regional interactions. The potsherds were 'obliged' to interact.

Attempts to apply theoretical models to the archaeology of north-central Venezuela are worthwhile and important; my critique is not directed toward the theoretical base of socio-political or developmental reconstructions. I maintain only that the insufficiency and imprecision involved in such exercises, imposed mainly by the data base, should be made explicit.

Neither of these two groups of archaeologists adopted a contextual archaeological methodology, nor applied it in systematic and controlled excavations of socially meaningful contexts, i.e., settlements, households, market places. For two reasons the insular and mainland data are incompatible and preclude socially meaningful comparisons. Firstly, there is a difference between the data obtained as a result of a 'high resolution' contextual archaeology (obtained i.e. through horizontal excavation, fine mesh screening, off-site control units and statistical control over sample size) practised on the islands, and 'low resolution', artefact-oriented studies on the mainland. Secondly, while moving from the islands to the mainland, the social identities of DM Valencioids diffuse and 'hide' behind the 'styles' of the Valencia series. Certainly, the socially, economically, ideologically and chronologically defined DM Valencioids cannot be fitted into the cultural, coarsely grained, panorama of the cultures of the north-central-Venezuela. The cultural (stylistic) unity does not equate with any historically concrete, politically, socially or economically integrated human group. Even though the term/concept Valencioid (as applied to the mainland), assumes only cultural homogeneity of material traits (i.e. pottery, urn burials, mounds), archaeologists have became to thinking of the Valencioids as a monolithic society, economy or political entity (i.e. chiefdom). When using the term mainland, coastal or inland Valencioid(s) throughout this study, I refer simply the bearers of Valencia styles of pottery, and am cognisant that these people are a mosaic of diverse societies, which should be identified in terms of their particular histories of socio-cultural development. Each component society may well have adopted its own, diachronically fluctuating, forms of economy, social organisation and ideology (see Hirth 1996: 206). Different types and forms of settlements of each one of these societies might have been dispersed through the region, including even the higher mountain tops (i.e. Amerindian pottery collected at Pico Naiguatá, almost 2800 masl). The inhabitants of each of these settlements participated in continuously fluctuating webs of socio-economic, political and ideological interactions with their closer and farther neighbours. Every Amerindian society, and at any time in its history, should be considered as a dynamic social unit, composed of living individuals capable of negotiating (individually and/or in groups) all issues crucial for biological and social reproduction, through trade, intermarriage, ceremonial assistance, co-operation in resource exploitation, in war and peace. Certainly none of these societies can be understood on the basis of a bunch of potsherds, nor treated as a socially anonymous pawn on the socially unanimated chess-board of the Valencioid 'chiefdom'.

The methodological means to identify and analyse contexts which are adequate to answer socially formulated questions (i.e. households), already exist in the repertoire of the discipline. To discover the societal richness concealed behind the pottery styles, or in other words, to construct the social realities of the Amerindian societies of the north-central Venezuela, according to whatever theoretical principles, artefact-oriented studies should be complemented by high resolution contextual archaeology, in which socially meaningful questions are directed toward such archaeological contexts that can answer them.

The Dos Mosquises Valencioids: society, economy, ideology

It has been determined that the Dos Mosquises Island was occupied by the bearers of the Valencioid pottery from a.d. 1430±80, and reoccupied in short cycles, probably, for a few decades or less. We do not know whether the island was still visited during early historic times. If so, then the contact between its occupants and the Europeans seems to have been sporadic or nil.

Some data shed light on the social composition of the occupants of the DM site. The individuals who were skilful in *botuto* processing for delayed consumption worked almost exclusively on the shore of the island, discarding the empty shells in low heaps. On the other hand, the individuals less efficient in this task were processing molluscs in the interior of the island, for immediate consumption, and separating shell lips for delayed manufacture.

It has been suggested that both specialised and non-specialised individuals were operating within different temporal frames and were representatives of different cultures. The more efficient individuals pertained to the 'pre-Valencioid' societies, present at DM Island before a.d. 1270±80. We know that these people depended on *botuto* gathering as much, or even more, than their successors. They left behind them heaps of efficiently processed *botuto* shells, plain, undiagnostic pottery, and indications of ephemeral use of other biotic resources of the islands. Whether they were, or were not, the creators of the *botuto* mega-middens, located on some islands, has not been yet determined.

A highly inefficient method of *botuto* processing is ascribed to DM Valencioids; however it may hardly be ascribed to the Valencioid male fisher-folk from the mainland coast. It may be expected that the fishermen possessed the knowledge and skills necessary to process effectively these marine resources, even if the *botuto* was a rare mollusc on the coast. If so, then the individuals who were inefficient in *botuto* processing were most likely women, inexperienced adolescents and/or children. However, such conspicuously inefficient processing might alternatively have been associated with some unknown ceremonial activities.

The evidence allows us to infer that women, men and children were present at the DM site. By the nature of long-distance open-sea navigation it may reasonably be expected that men (paddlers) were present regularly and were the most numerous site occupants. We do not know whether the women and children were regularly present at the site or came only for special occasions.

I suggest that the proportions of males and females at the site depended on the gender-scheduled activities in the permanent settlements on the mainland. The data indicate that no late prehistoric culture on the north-central coast of Venezuela was a truly maritime nor littoral culture; in other words nobody's staple diet depended primarily on sea resources (see Lyman 1991: 76-77). All cultures of the region depended mainly on agriculture and additionally, and in variable measures, on both terrestrial hunting and marine fishing. Therefore, it is expected that during the dry season some men dedicated themselves to terrestrial hunting; toward the end of this season, the presence of all men was necessary for the communal clearance of the agricultural fields. The women had to stay on the mainland during the major part of the rainy season for planting and looking after the crops. The data suggest that the DM Valencioids would more likely navigate to the islands between May and October (see Chapter 4), when the sea in this region is relatively calm in comparison to the first months of the year. Given that the rainy season on the coast begins in May, the women could only sporadically join the men during all these months of calm sea, and therefore, they were not recurrent visitors to the islands.

Some additional light on the social composition of the DM Valencioids may be shed by the fact that the dog, a companion *par excellence* of the historic Amerindian families (Civrieux 1980; Roe 1995b), was absent in DM. If dogs were not taken on the insular voyages, then these enterprises might normally have been short term and composed of specialist parties of experienced adult men rather than all members of the household (see also Civrieux 1980: 177 for the description of the *romerías* of Carib men). These inferences may strengthen the assumption that the presence of women at the DM site was only sporadic.

In Chapter 8 I have demonstrated that a chief, shaman and/or warriors were present at DM, at least during some occupational events. These high status individuals might have occasionally been accompanied by women and children. It may be suggested that they were responsible for the overall success of the island enterprise. The data indicate that some insular food resources were used to emphasise the asymmetrical social relations of the occupants of the site. Significantly larger quantities of lobsters, fish and turtle were consumed within the area of Trench B, where the indicators of the presence of high status individual(s), as well as women and children, were concentrated. These foods, as well as the flesh of *botuto*, conspicuously extracted without damaging the shell, were preferentially consumed by these individuals. Specialists in fine shell work were also working in the area of Trench B. Whether they were attached to the high status individuals, who could have been brought to the islands to supervise the procurement of shell raw material, or whether some of the high status individuals were personally dedicated to shellworking, cannot be determined.

Another datum on the social composition and status of DM Valencioids comes from the analyses of the human burial context (Trench C). The articulations of the arms and vertebrae of the skeleton of the man recovered from the Trench C show heavy attrition that, according to our physical anthropologist, strongly suggest that the deceased was a paddler and/or fishermen during his life (E. de Berrizbeitía, personal communication 1990). The disposal of a burial along with everyday refuse, and the fact that the burial offerings were relatively poor in comparison to the items deposited in other areas of the site, may indicate that the deceased was a low status person. If the DM Valencioids considered the discarded *botuto* shells as symbol-laden items, then the dozens of shells upon which the corpse was intentionally disposed may be seen as grave-furniture for somebody who was instrumental in procuring *botutos* during his life.

I conclude that the DM site was occupied by social segments quantitatively dominated by men but differentiated by sex, age, specialisation (skill?) and status. The proportions of males to females varied from one occupation to another. I should emphasise, that I cannot identify the composition of any concrete Valencioid society that visited the DM Island at any particular moment of time. For now, I only indicate who, in cultural and social terms visited DM and how long people may have stayed there during the whole occupational history of the site.

The economy of DM Valencioids relied on the gathering of *botuto* (*Strombus gigas*), probably, throughout whole occupational history of the site; however, we do not know what amount of *botuto* flesh was consumed *in situ* and what (if at all), was prepared for delayed consumption on the mainland. From the economic point of view, the exploitation of *botuto* might have been preferred over other local resources because of its high population densities in the Los Roques Archipelago, as well as the remarkably low risk, effort and minimal technological and co-operative involvement necessary in its procurement. The high volume and nutritious quality of the meat are much greater than those of any other marine mollusc. These data strongly suggest that the importance of *botuto* for prehistoric economies in north-central Venezuela is different from that of all other marine molluscs, which have traditionally been portrayed as marginal or buffer resources, and whose contribution to the prehistoric diets could not compete with those of land game and/or fishing resources (Osborne 1977; see Waselkov 1987). The extraordinary spatial concentration of natural *botuto* populations and large *botuto* shell middens in Los Roques Archipelago suggest that the prehistoric exploitation of this resource could successfully compete with subsistence strategies based on exploitation of other local resources such as marine turtle, reef fishes and lobsters. I further argue that even if the *botuto* was not a staple food for the societies from the adjacent mainland coast, the periodical input of such large amounts of *botuto* meat (dried and/or salted) could have had an impact on the regional economies, politics, as well as, possibly, demography and health status, in ways which should be archaeologically detectable through systematic investigations of mainland Valencioid sites.

However, the *botuto* was not only perceived and valued as food by the DM Valencioids; they also gathered it for its shell and because of its symbolic value. The outer lips were separated from shells, piled up together and subsequently shipped to the mainland for further elaboration. The data from the mainland coast indicate that these preforms were channelled directly toward the inland communities of the Valencia Basin. There, part of this exotic raw material was converted into personal adornos and other valuables.

The data from the Valencia Basin indicate that the *botuto* shells began to play an increasingly important role in the socio-economic and symbolic life of its inhabitants, at least since Barrancoid times (a.d. 310±120). Whether or not the roots of the Valencioid *botuto* symbolism should be sought in a wider, Pan-American scenario, or in a local tradition, is a question of further controversy. What should be emphasised here is that the central coast of Venezuela has no natural habitats which can sustain large populations of *botuto*. Therefore, the demand for *botuto* had to been satisfied from outside the central coast; i.e. in the Morrocoy area to the west. However, the only habitats that could assure a constant supply of large quantities of *botuto* shells are on the offshore islands, mainly Los Roques and Las Aves (de Sotavento) Archipelagos and on Bonaire. Given the strong economic, social and symbolic role of *botuto* for Valencia Basin societies it may reasonably be expected that they were able to use variable strategies to gain and secure the access to the natural Strombidae 'mines' on the islands.

We know that the economy of the DM Valencioids relied largely on *botuto* gathering; however, we also know that they procured other local resources. I established that fishing was focused on inshore habitats, preferably on the seagrass bottoms and reefs, and that the pocket seine was used rather than large gill nets or traps. The bow and arrows and spear were also used in fishing, although only occasionally. The majority of fish were processed, boiled and consumed *in situ*. Turtles were captured on the beach and at sea, but their exploitation was not carried out on such a large-scale as would be expected, given that the islands provide ideal habitats for turtle feeding and breeding.

Lobsters, marine crabs, chitons and sea urchins were marginal food resources. Birds were also exploited incidentally; the flamingos may have been pursued for feathers rather than for meat

These data indicate an opportunistic, 'prudent' exploitation of all inshore habitats of DM island, as well as an unexpectedly low exploitation of such abundant local resources as turtle and lobsters. This may suggest that the DM Valencioids were not representatives of a fishing society with an open-sea fishing techno-economy. However, it may also be argued that the occupants of the site might have been skilful offshore fishermen who, once on the islands, adopted the inshore fishery patterns. They were not interested in taking risks and engaging in open-sea fishing while staying in an area which is situated so far from their homeland and, above all, has an abundant supply of protein guaranteed by the *botuto.* The evidence seems to favour the second hypothesis.

The DM Valencioids were, undoubtedly, good navigators. People who were regularly crossing a 135 km long passage of open-sea, which is one of the longest inter-island gaps in the Caribbean, must have been acquainted with the open-sea environment and its resources. The teeth of *mako* shark, found in DM, also indicate that some of the site's occupants were engaged in specialised off-shore fishery (see Widmer 1986: 244). On the other hand, the Valencioids settled on Cayo Sal Island (CS/D site) were very audacious fishermen engaged in exploiting the pelagic bill fishes.

It seems more than likely that the majority of DM navigators came from the mainland coast and were members of Valencioid fishing communities. We know that coastal Valencioids possessed an open-sea fishing technology since at least a.d. 1200. Taking into account the above considerations, I conclude that the DM Valencioids did not reproduce on the islands the patterns of off-shore fishing which they practised on the coast. Instead, they focused on the exploitation of *botuto,* and secondarily, on turtles and reef fishes, all of them rare, exotic resources on the mainland coast.

I have already pointed out the symbolic use of *botuto* in the Valencia Basin since 'pre-Valencioid' times (see Chapter 8). This may strongly suggest that ideological, as well as economic, reasons could underlie the emphasis on *botuto* exploitation on the islands. The possible influx of dried *botuto* meat to the mainland sites cannot be directly traced in the archaeological record and the indirect evidence (i.e. character and change in temporo-spatially congruent sets of coastal and inland economies) is insufficient and inadequate. In consequence we do not know whether the Valencioid people were consuming *botuto* meat only during their stay on the islands, or also preserved it and brought it to the mainland. We do know, however, that they were bringing to the mainland *botuto* shells and preforms.

In any case, both symbolic and economic reasons underlay the exploitation of this resource on the offshore islands. The strength with which the supposed aphrodisiac properties of *botuto* meat and turtle eggs drive the exploitation of these resources by the contemporary inhabitants of these islands may echo pre-Hispanic preconceptions; however, if any evidence to test such assumptions does exist it is beyond my reach. Having determined that the main reason for insular enterprises was the exploitation of *botuto*, can we shed more light on the ideology hidden behind this phenomenon?

The quantity and diversity of all non-ceramic artefacts per cubic meter of cultural deposit were larger in the area of Trench B than in any other part of the DM site, and in any other site in the islands. Additionally, the conspicuous spatial concentration of high value (high energy-investment and symbol-laden) artefacts, such as polished stone micro-axes (with no use-wear), pendants made of non-local raw material, as well as marine and land shell pendants, suggest that these items were not accidentally 'lost' in this area. They were rather consciously deposited, perhaps using the place for the provisional storage of artefacts to be used at a later visit to the site (see Siegel 1995: 60). Indeed, the small artefacts could easily be lost in the sandy soil of the islands if they were not kept together. The data indicate that many of the Trench B items might have been kept in containers of turtle carapace.

The one-sided interpretation of this conspicuous deposit escapes us. Several symbol-laden items of possibly ceremonial character which were also found in this deposit along with the sumptuary stone artefacts, suggest that this feature was not, or not exclusively, for the provisional storage of artefacts. Such items as deer bone flutes and land-shell whistles, as well as resin (probably for ritual burning) and ochre (for body painting), indicate that ceremonies, accompanied with music and the ritual burning of resin, were carried out at this area. I speculate that the ceremonies included propitiatory rites dedicated to the spirit-protectors of marine animals, among them particularly the *botuto* (see Chapter 8). The contextual analyses of these items suggest that they may have been disposed purposefully as offerings. Therefore, the deposit of artefacts in Trench B may rather be interpreted as an 'offertory cache' (Schiffer 1987: 80) than as storage of artefacts for future use. Around this core locus were carried out ceremonial activities, food preparation, consumption, and roughly spatially patterned discard of food debris by the prominent members of the society and their relatives. Fine shellwork was also involved. In conclusion, this core locus has polysemous meanings and the surrounding area served as a place for activities of diverse nature.

Given that almost all sumptuary items and the symbol-laden ceremonial paraphernalia from this core locus came from the mainland, and are of terrestrial origin, it may be suggested that that the ceremonies were developed by societies characterised by strongly land-oriented ideologies. The wide repertory of bone remains from mainland animals found in the core locus suggests that the ceremonial activities were rooted in the ancestral ideological complex developed for terrestrial hunting in north-central Venezuela. Furthermore, the data seem to indicate that the *botuto* was also included into the ideological pantheon of DM Valencioids.

To conclude this discussion dedicated to DM Valencioids I should briefly emphasise the large hearth feature recovered in the Trench C, that was undoubtedly re-used during several occupational episodes. Such a large fire place might have served different purposes. Apart from its role in cooking, it might have been used as a 'lighthouse' for orienting Valencioid sailors, and as a marker (by means of fire in the night and smoke during the day) of the special position and role of the DM site within the web of Valencioid campsites in Los Roques Archipelago. The spatial reproduction of certain activities related to both subsistence and ceremonial domains suggests that the DM Valencioids might have been not only culturally homogeneous (as already determined) but also a socially and ideologically bounded group of people, at least during the substantial time span of the site occupational history. I further speculate that we may, in fact, be dealing with a particular group of Valencioid people (i.e. members of a few households from a particular coastal village) who visited the DM site regularly, led by their high status villagers.

Inter-insular micro-contexts

It is a great temptation to speculate that the high status DM Valencioids might have been entrepreneurs recruited from coastal Valencioid settlements, who controlled all activities in the entire Los Roques Archipelago. Furthermore, the DM settlement, with its 'offertory cache', have served as the pivotal point around which gravitated all organisational and ceremonial activities. The DM site has, undoubtedly, many special locational advantages that make it an exceptional feature in the geography and landscape of the archipelago (Antczak and Antczak 1991b). It is located in the middle of the natural gateway en route to and from the central and central-western coasts of Venezuela. It lies at the liminal point where the open sea meets the shallow, interior lagoons of the archipelago, where the perception of danger and uncertainty blends with those of safety and security. The island has ideal conditions for an observation point and as a guiding 'lighthouse'. The location also gave to its occupants an immediate access to the resources of sea-grass and coral reef habitats. The island is also situated close to large, natural salt pans (Cayo Sal) and to the only permanent brackish but potable water aquifer (Cayo de Agua).

The quality, quantity, diversity and density of Valencioid artefacts within the DM site, as well as the complexity of their contexts, has not been surpassed by any other insular site we have investigated thus far. These characteristics may suggest that several locational advantages, as well as some unknown ideological reasons, have been taken into account by the founders of the DM settlement.

These data seem to suggest that during certain periods, sets of Valencioid settlements in Los Roques Archipelago could serve as seats of diverse groups of labour subordinated to the central authority that resided in Dos Mosquises Island. Unfortunately the data from other Valencioid sites in Los Roques Archipelago cannot shed much light on the nature of the interactions between their inhabitants. This is because the sites in Los Roques, as well as in the La Orchila islands, enclose aggregations of remains, some of which might have been deposited within either different or the same spatio-temporal frames, and which reflect diverse episodes and forms of organisational arrangements on the part of their occupants. Certainly, these do not preclude the intuitively plausible possibility that the people from various Valencioid sites in Los Roques could coexist and interact, being co-ordinated by the DM authorities. However, the available data are inadequate to determine whether this was so, and what groups were centrally co-ordinated, totally independent, temporally dependant or opportunistic.

We know that the Cayo Sal Valencioids (CS/D and CS/C sites) were, almost certainly involved in salt exploitation, as well as very intense harvesting of *botutos*. The lack of European artefacts in these sites suggests that contact with the Europeans was incidental or nil. This leads me to suppose that Pimentel (1964[1578]) was not referring to the exploitation of Los Roques salt pans by the post-contact 16th century *Caraca* Indians, unless it was a sporadic event which did not leave archaeologically recoverable evidence. A similar situation is repeated at La Tortuga, the island with second largest source of salt in north-central Venezuela. The Amerindian sites located on the border of the salt pans in this island did not yield European artefacts either. In conclusion, I suggest that Pimentel referred rather to the still 'living' memory of pre-Hispanic salt exploitation.

Some non-ceramic artefacts from CS/D and CS/C sites share formal characteristics with those from DM; however, the economy, group composition and ideologies of the occupants of these sites may have been different. Let me emphasise that the CS/D Valencioids practised both inshore and open-sea fishing. Large marine turtles and pelagic fishes were incorporated into their ritual activities, which were accompanied by music of flutes and whistles. I assume that a shaman and women were present at the CS/D but there is no evidence of the presence of other high status members such as chiefs and/or warriors. The geographical location of this site in the south-western corner of the archipelago is privileged; however, the visibility from and defensibility of CS/D was notably inferior to that of DM site.

In conclusion, it seems probable, though not yet proved, that the people from the DM site could coexist and interact with other Valencioids in the Los Roques Archipelago. The natural, cultural and social data seem to suggest that the DM Valencioids controlled the exploitation of Los Roques natural resources in socio-political and ideological terms. However, until the relations between the Valencioid sites and societies in the archipelago are fully disentangled these issues cannot be further pursued.

Inter-island macro-contexts

The special nature of Dos Mosquises Island and its archaeological deposits should also be assessed from a wider inter-island geopolitical perspective. This settlement was located at the interface between the northern peripheries of the spheres of interaction of the bearers of two late prehistoric mainland pottery series, namely Valencioid and Dabajuroid. By a.d. 1200 the Dabajuroids had already colonised the islands of Aruba, Curaçao and Bonaire (Oliver 1989; 1997). About a.d. 1260±80 they were present at the Las Aves de Sotavento Archipelago (AG sites). However, Las Aves de Barlovento Archipelago, which lies between Las Aves and Los Roques, was not occupied until late prehistoric or even early historic times (Isla del Tesoro and Curricai sites, both dated to a.d. 1530±80). This late eastward expansion of the Dabajuroid people could coincide approximately with the latest phases of the occupation of DM site.

These data indicate that the DM settlement, being the westernmost extension of the Valencioid insular domain, could have functioned as a frontier outpost. If so, then the material deposited within the 'offertory cache' area at DM site might have served, among other things, as a transmitter of a warning message: 'access rights-reserved space' (see Acheson 1981: 281). By loading the DM settlement with artefacts, whose producers and users could easily be identified by any non-Valencioid visitor, the Valencioids may have wanted to legitimise their exclusive rights and advertise a potential use of force to defend the resources of the area, if borders were violated and resources exploited.

Before turning the discussion toward the mainland I should emphasise that, for now, there is no logical necessity to insist that insular enterprises were under the control of a 'chiefdom'. A headman of a Valencioid village and his high status followers from the mainland, a 'Big Man' such as the historically known *cacique* Naiguatá, could easily have promoted and controlled the Valencioid activities in the Los Roques Archipelago.

Macro-regional problems and issues for future research

In the previous section I used data from the islands to discuss some key issues related to the archaeology of north-central Venezuela. In the present, and final, section of my thesis I return to the broader picture and emphasise certain questions which still remain unanswered - and may, in the present state of knowledge, be unanswerable. Nevertheless, it is possible to put forward some ideas for future testing. I am well aware of the limitations imposed by the inadequate data-base from mainland sites, and of the fact that my cultural-historical reconstructions are based on 'potsherd animation' procedures. However, my intention is not to formulate models of societal interaction but to provide some new insights and perspectives to be taken into account in future archaeological research in the region.

Rather surprisingly, the data suggest that some of the DM Valencioids were representatives of inland societies located in the Valencia Basin, and not, as one might expect, of Valencioid communities from the mainland *coast*. The question then arises: By what means did these inland people come to possess the skills, knowledge, and technology of open-sea navigation and marine resource exploitation? To reconcile this apparent contradiction I suggest that the high status individuals present at the DM site were inland Valencioids who moved seasonally from the Valencia Basin down to the coast, where they joined with the coastal Valencioids before setting off for the islands. Back on the mainland, the bulk of the exotic resources obtained from the islands was, according to the evidence, channelled directly to the inland settlements. This would suggest that some inland polity(ies), whose forms of socio-political organisation might have ranged of between a 'Big Man' type of headman leadership and a chiefdom led by a paramount chief and his elite, could have promoted the insular enterprise in order to gain access to differentiated resources.

I would further suggest that possible receivers of the insular goods might have been the late occupants of the La Cabrera site, located on the north-eastern shore of Lake Valencia. *Botuto* shell artefacts and fragments, as well as pieces of coral, were conspicuously abundant in the upper levels of this deposit (Berry 1939: 558). If, in fact, the La Cabrera Valencioids were the receivers of the insular products, and were at the same time the entrepreneurs who promoted and controlled the insular voyages, then the Valencioid villages on the coast (i.e. Playa Chuao, Puerto Maya) were not completely independent units. The economic interaction might have been asymmetrical as regards the flow of *botuto* and other island products, but the coastal communities could have been compensated by the exchange of inland foodstuffs, by assistance with craft specialisation, and by ceremonial and military support. The articulation between coastal and inland Valencioids could have been structured through the asymmetrical relation of power between the societies of the centre and the periphery, between egalitarian and non-egalitarian, and between the dominant and the dominated. This, however, remains a speculation. These same interactions may alternatively be seen as based on processes of mutual assistance and complementarity. For reasons I explain below, I am more inclined to favour the second hypothesis, while admitting that neither of them can be decisively proved or refuted on the basis of existing archaeological evidence.

The establishment of Valencioid villages on the coast somewhere around a.d. 1200 (if we can rely on the single radiocarbon date of a.d. 1206±98 from the Playa Chuao site) seems to be the culmination of a gradual, long-term 'affair' between the Valencioid people and the marine environment, mediated by their Ocumaroid counterparts who had inhabited the coast since 'pre-Valencioid' times. In the following pages I argue that by a.d. 1200 the inland Valencioids already had at least 300 years of contact with Ocumaroid people, which probably involved economic, social and ideological interaction.

Archaeologically, one of the outstanding, and still unresolved, problems is: What exactly was happening on the north-central coast between ca. a.d. 900 and 1200? The existing, somewhat unreliable, radiocarbon chronology confirms the presence of Valencioid communities in the

Valencia Basin by a.d. 900, if not before (see below), but on the coast we have no Valencioid sites demonstrably earlier than 1200±100. Various alternative scenarios can be constructed for the 'missing centuries' in the coastal sequence:

1. the coast was uninhabited at this time
2. some of the still undated Valencioid sites on the coast (i.e. Puerto Maya, Cata, Cepe, among others [see Martín 1995]) may begin earlier than we think
3. the north-central coast was occupied at this time by Ocumaroid fishermen who maintained some sort of relationship with the inland Valencioids.

The first of these alternatives can be ruled out. Although the coastal Valencioid sites of Playa Chuao and Puerto Maya have no known pre- or non-Valencioid components, this does not imply that the bays of Chuao, Puerto Maya, Cepe, etc. were uninhabited and unexploited in 'pre-Valencioid' times.

Archaeologically, sherds of Ocumaroid pottery have been excavated in early (pre-Valencioid) contexts at various sites. On the coast, at El Palito they occurred as export pieces in the Barrancoid strata (Cruxent and Rouse 1958: 152; 163) and in the Valencia Basin, at the site of La Cabrera, in the Barrancoid deposits stratified below the Valencioid levels (Cruxent and Rouse 1958: 309; Cruxent 1948; see Figure 91).

The second alternative cannot be confirmed or disproved until we have more stratigraphies and radiocarbon dates. Chronology is critical. The conventional view, expressed in most Venezuelan archaeological texts, imagines an expanding 'chiefdom', centred on the Valencia Basin, that eventually 'took over', or even 'conquered', the adjacent coast - though there is absolutely no archaeological evidence for the violent subjugation or displacement of the coastal Ocumaroids by Valencioid newcomers.

The third scenario (which is the one I am advocating) has not previously been put forward in the literature, and it envisions a more complex situation for the period a.d. 900-1200. In the present state of information I present it only as a hypothesis and as a pointer to the direction of future research.

If the first Valencioid villages really did appear on the coast as late as a.d. 1200, then fractions of the inland Valencioid communities might have moved seasonally to the coast, with increasing participation in coastal (perhaps multiethnic) fishing activities, for at least three centuries before this date. Following on from this suggestion, I argue that the foundation of Valencioid villages on the coast was an outcome of multivariate, diachronically fluctuating processes of negotiation of mutual interests, largely peaceful, between the inland Valencioids and the coastal Ocumaroids.

It should be remembered that the Ocumaroids were the first identifiable pottery-using people who visited the offshore islands. But before examining the possible origins and nature of Ocumaroid insular enterprise we must first return to the Valencia Basin and question certain 'received truths' about the chronology and development of the inland Valencioid polity(ies).

The first doubt concerns the conventional, and often quoted, date for the beginnings of the Valencia culture (a.d. 900). According to the radiocarbon dates, the artificial mounds on the western shore (the Los Cerritos site) were already built up and occupied by a.d. 925±115 (Peñalver 1969). In fact, the whole sequence of radiocarbon dates from the mounds on both western and eastern lake shores, which bracket the most conspicuous remains of the Valencia culture, shows a high internal consistency, ranging from a.d. 925±115 and 970±110 (Rouse and Cruxent 1963; Peñalver 1969). Given the large error-margins, these determinations suggest that the 'golden age' of the Valencioid moundbuilders could fall anywhere between a.d. 800 and 1100. At the 2 sigma range the potential time span is even greater. After the peak period of mound-building, the later history of the Valencioid culture in the Basin becomes rather confused. The mounds themselves may have been abandoned, but Valencioid occupation clearly continued until just before the Spanish Conquest. It is at precisely this late stage that the inhabitants of La Cabrera might have gained importance on the regional socio-political scene. At this time, too, marine items appear abundantly at this site (Berry 1939).

Secondly I would question the popular view of the 'paradisiacal' nature of the Valencia Basin environment, which has permeated uncritically into archaeological discourse. Although the fertile agricultural plains are attractive for agriculture, life in the Basin was not without hazards. Apart from long-term fluctuations in the global climate, which brought about changes in rainfall, lake levels and vegetation (Schubert 1978, 1980; Bradbury et al. 1981; Leyden 1985; Curtis et al. n.d.; see Chapter 1) the area is prone to more sudden local catastrophes. Violent and unpredictable water level rises of up to several metres are recorded and, in the past, must have had serious consequences for human settlements and crops. Without falling into the trap of environmental determinism, we might suggest that the development of the Valencia culture had its ups and downs, and was not necessarily a story of continuous and uninterrupted progress towards increasing complexity and economic-political power.

I discuss these issues here because many archaeologists have seen the 600 year-long development of Valencioid societies as a unilinear process of socio-cultural 'evolution' that continued progressively up to, or even beyond, the threshold of the European Conquest. The Valencioid culture cannot be considered as a monolithic producer of stylistically unified pottery over the period of 600 years. My view differs totally from such a perspective. I conceive Valencioid history as a kaleidoscopic sequence of interconnected periods of evolutionary progression and recession of one or more local polities, embedded in a web of interactions of diverse nature, intensity and duration, between each community and its neighbours. In this perspective all possible causes of the social change should be analysed and assessed according to their historical and contextual specificity (Shanks and Tilley 1987: 185). Certainly the available data do not permit us to determine the origins of the Ocumaroid insular enterprise; however some preliminary ideas on this issue may be forwarded.

We know that the Ocumaroid site in Domusky Norte Island was occupied between a.d. 1020±80 and 1330±80, and the date of its foundation seems to coincide with the purported end of the 'golden age' of the Valencioid mounded villages (a.d. 970±110). On the other hand it pre-dates or is contemporary with the establishment of Valencioid villages on the coast (a.d. 1206±98). In consequence, the causes of the Ocumaroid insular enterprise may be sought in the nature of the relationships between Valencioid and Ocumaroid polities and may also be linked to the changes in wider geopolitical scene of the region; i.e., the expansion of the Dabajuroid polity (here we do have grounds for thinking that it was a polity under a paramount chief [see Oliver 1989; 1997]). Given the long-lasting Valencioid/Ocumaroid liaison, my guess is that the DMN settlement was an outpost which guarded both Ocumaroid and Valencioid interests in the insular area, in view of the imminent expansion of the Dabajuroid people toward the east. The Valencioids might have moved toward the coast to strengthen the Ocumaroid settlements and in this way support the insular enterprise which they could not undertake by themselves.

I further suggest that the origins of the Valencioid insular enterprise should be sought in the rupture in the Valencioid/Ocumaroid 'alliance'. The evidence indicates that the Ocumaroids were supplying Valencioids with insular resources for centuries; however, after the establishment of Valencioid settlements on the coast the competition for exclusivity in the distribution of marine resources toward the mainland, might have produced tensions and open conflicts which may have ended in the rupture of the long-lasting relationship. As a consequence the DMN settlement declined, about a.d. 1330±80, and was almost immediately succeeded by the first Valencioid settlement, in (a.d. 1430±80).

In fact, several possible causes of the rupture in the Ocumaroid/Valencioid alliance may be mentioned. It could be a result of (1) the competition for redistribution of insular resources toward the Valencia Basin (discussed above), (2) the growing intensity of the alliance between Valencioid and Dabajuroid societies and/or (3) the fall of the inland Valencioid polity. Archaeological evidence indicates that all these processes could have coincided about a.d. 1400.

The second of these hypotheses seems plausible since Dabajuran sherds of Late Urumaco phases (a.d. 1400-1450) have been found as trade artefacts in the Playa Chuao site (Oliver 1989 vol. 2: 428). On the islands, some Dabajuroid potsherds were found in both DM and CS/D sites. Valencioid potsherds were also found in the Dabajuroid site at Ave Grande, at about the same time (this site has two radiocarbon dates: a.d. 1260±80 and 1480±80). I incline to ascribe the same temporal frame to the westward spread of Valencioids, toward the area of Tucacas (Tucacas style; Cruxent and Rouse 1958). However, without high resolution and socially sensitive archaeological data it is impossible to determine the nature of the alliance between Valencioids and Dabajuroids and to distinguish whether it may be considered as a result, or a cause, of the rupture of the Valencioid/Ocumaroid alliance.

In fact, the Valencioids and Dabajuroids could have been competing for the control over the long-distance trade in *botuto* shells toward the Venezuelan Andes; however, *botuto* shells are exceedingly rare in the Dabajuroid sites in Falcón State (José Oliver, personal communication 1998). This suggests that we should consider the bearers of the San Pablo/Osoid and Tierroid pottery from the Lara and Yaracuy States, an region located between the Valencioid and Dabajuroid core areas (Nectario María 1942; Cruxent and Rouse 1958; Arvelo and Wagner 19923; Arvelo 1995), as possible middlemen in *botuto* trade.

The inter-regional geopolitical perspective provides evidence according to which the exploitation of *botuto* on the offshore islands could be driven not only by internal, Valencioid needs but also by external demand. The pectorals representing the bat with open wings, found in the Venezuelan Andes, Andean Piedmont (Lara State) and as far as Puerto Rico (Oliver 1992) are made of the outer lip of *botuto* (see page 123). The quantity of these items in archaeological sites decreases when moving from the west to the central regions of Venezuela (Spinden 1916: 326). In north-central Venezuela such pectorals are uncommon; only a few specimens made from *botuto* or stone are known (von den Steinen 1904; Oramas 1946: 49). These data suggest that a large centre of demand for *botuto* shells was located in the Andean region and that commercial and, probably, certain ideological connections united the Amerindian societies across the whole of western Venezuela. I further speculate that only one part of the *botuto* shells, brought from the islands, was used locally by the Valencia Basin societies, while the other was converted into exotic commodities which were traded through middlemen into the Andean region. It is very tempting to continue this speculation about the nature of exchange mechanisms and their possible influence on social complexity in the Valencia Basin. However, there are neither adequate nor sufficient data to unmask the origins, chronology, nature and intensity of these processes (see also Molina 1985; Sanoja and Vargas 1987). For now, I would emphasise that both the symbolic importance of *botuto,* as well as the significance of Los Roques Archipelago as the major 'mine' of this resource in the whole of Venezuela, should be taken into account when discussing the socio-economic developmental trajectories of the prehistoric societies of north-central Venezuela, and their inter-regional connections.

The last hypotheses relate to the demise of the inland Valencioids, after a.d. 1400. We know, from historic sources, that the level of the Lake Valencia was exceptionally high in the early 16th

century. Undoubtedly, the lake flooded the fertile alluvial plains which were the agricultural heartland of inland Valencioids. If some mounded sites were occupied by that time they would soon have disappeared under water, as confirmed by the data collected by Kidder (1944) and Berry (1939). Such a huge flood could have destabilised the economic base of the inland polity(ies) and have resulted in an exodus toward north, east and west. These hypotheses may explain why the Spanish Conquerors did not leave any written testimonies about the mounded villages or their inhabitants, and did not record the existence of any Valencioid individuals characterised by spectacularly artificially deformed heads. They never encountered them. Could the origin of the DM Valencioids lie in the dramatic fall of such inland polity(ies)?

J. M. Cruxent suggested that the permanent, coastal settlements of the DM Valencioids have not yet been discovered on the mainland coast (J. M. Cruxent, personal communication 1989). I can agree with him if under 'coast' we include both the narrow strip of land adjacent to the seashore and the northern slopes of the Cordillera de La Costa, that fall toward the sea. The evidence indicates that the colonial settlement pattern in the region closely reproduced the Amerindian pattern of settlements, and that the belt of truly coastal settlements was paralleled by another, located on the slopes of the Cordillera (Martín 1995). These patterns survived until today and are the best indicators of a quite dense net of settlements spread all over the different micro-ecological zones of the region.

This pattern makes good ecological sense for prehispanic times as well as the present. A society dependant on a broad range of foodstuffs (i.e. maize and other crops, terrestrial game and sea food) can have its main settlement anywhere within its production-area. It is possible, then, that the prehispanic coastal sites were not more than outliers of agricultural sites located on the lower slopes of the Cordillera.

It may be expected that the settlements located toward the mountain slopes were situated at strategic points where the routes which follow natural paths over the Cordillera begin, and connect the seashore with the inland valleys of Aragua, Carabobo, Caracas and Tuy. Some of these sites, such as El Topo (Cruxent and Rouse 1958), San Gean (Peñalver n.d., b, c) and La Cesiva (Martín 1995) are already identified, but none of them has been systematically excavated. Sites such these are the eventual candidates for the permanent village(s) of the DM Valencioids on the mainland.

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APPENDIX 1. *Distribution of modified Strombus gigas shells, DM, site, Dos Mosquises Island, Los Roques Archipelago.*

Area of Trench C	Type	J							J/A					A							A/O				V			Total
		?	0	1	2H	2V	3H	3	?	0	1	2H	2V	?	0	1	2H	2V	3	4	? 2H	0	1		?	0	1	
A	1	0	0	0	0	0	0	0	0	4	0	0	0	0	5	8	0	0	0	0	0	1	2	0	0	0	0	20
B	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	2	0	0	0	0	0	0	0	0	0	0	9
C	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	2	5
D	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	1	0	0	0	0	1	1	0	0	0	0	10
E	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
F	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	9	0	0	0	0	0	1	0	0	0	0	2	15
Subtotal		0	0	0	0	0	0	0	0	4	0	0	0	0	15	28	3	0	0	0	0	3	4	0	0	0	4	61
A	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
B	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
C	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
D	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	1	0	0	0	0	0	0	0	0	0	0	8
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	0	3	8	1	0	1	0	0	0	0	0	0	0	0	13
A	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
B	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	1	0	0	0	0	4
C	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	10	0	0	0	3	16
E	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	1	0	0	0	1	6
F	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	1	0	0	0	0	1	12	0	0	0	4	27
A	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
A	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	5	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	1	0	0	0	2	0	0	9
C	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	5	0	0	0	0	0	0	0	1	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	6
E	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
F	5	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Subtotal		1	0	0	0	0	0	0	1	0	0	0	0	13	0	0	0	0	0	0	2	0	0	0	2	0	0	19

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A	6	0	0	0	0	0	0	0	0	13	0	0	0	0	12	0	0	0	0	0	0	8	0	0	0	0	0	33
B	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
C	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
D	6	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	7
E	6	0	0	1	0	0	0	0	0	0	0	0	0	0	11	2	0	0	0	0	0	0	0	0	0	1	0	15
F	6	0	0	1	0	0	0	0	0	1	0	0	0	0	16	1	0	0	0	0	0	1	0	0	0	0	0	20
Subtotal		0	0	2	0	0	0	0	0	14	0	0	0	0	43	6	0	0	0	0	0	11	0	0	0	1	0	77
A	7	0	1	35	0	0	1	1	6	0	6	0	0	18	0	25	2	0	0	0	9	0	0	0	1	0	0	105
B	7	1	68	97	6	0	1	0	0	7	20	2	0	1	13	42	5	0	0	1	2	0	0	0	0	1	2	268
C	7	0	22	37	4	0	1	0	0	5	3	0	0	1	2	22	1	1	0	0	0	0	0	0	0	1	0	100
D	7	0	87	23	3	0	0	0	0	6	4	1	0	8	14	18	1	0	0	0	1	0	0	0	0	1	0	167
E	7	0	64	40	1	1	0	1	1	0	4	0	0	3	17	83	3	0	0	0	1	0	2	0	1	0	1	223
F	7	0	123	120	1	0	1	1	1	20	59	0	1	11	22	124	8	1	0	0	1	1	5	1	0	0	7	508
Subtotal		1	365	352	15	1	4	3	8	38	96	3	1	42	68	314	20	2	0	1	14	1	7	1	2	3	10	1372
A	8	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
B	8	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
C	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	8	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	3
E	8	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
F	8	0	0	0	0	0	0	0	0	1	0	0	0	0	8	0	0	0	0	0	0	2	0	0	0	0	0	11
Subtotal		0	0	0	0	0	0	0	0	3	0	0	0	0	15	0	0	0	0	0	0	3	0	0	0	0	0	21
A	9	1	0	0	0	0	0	0	1	0	0	0	0	15	0	0	0	0	0	0	2	0	0	0	1	0	0	20
B	9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
C	9	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
D	9	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	3	0	0	0	0	0	0	6
E	9	1	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	7
F	9	1	0	0	0	0	0	0	5	0	0	0	0	6	0	0	0	0	0	0	2	0	0	0	3	0	0	17
Subtotal		3	0	0	0	0	0	0	10	0	0	0	0	28	0	0	0	0	0	0	7	0	0	0	4	0	0	52
A	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	10	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
A	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	11	0	0	0	0	0	0	0	4	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	12
C	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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D	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	11	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
F	11	2	0	0	0	0	0	0	11	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	19
Subtotal		2	0	0	0	0	0	0	15	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	32
A	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	12	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
A	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
B	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
A	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	14	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	4
E	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	4
A	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	3
E	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	3
A	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
B	16	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
C	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	16	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1

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Subtotal		0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	4
A	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	17	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
C	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
D	17	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	3
E	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	17	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Subtotal		0	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3	1	8
A	18	0	18	14	0	0	0	0	0	13	2	0	0	0	6	3	0	0	0	0	0	3	0	0	0	0	0	59
B	18	0	9	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	14
C	18	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
D	18	0	0	0	0	0	0	0	0	1	1	0	0	0	4	0	2	0	0	0	0	0	0	0	0	2	0	10
E	18	0	9	6	0	0	0	0	0	2	1	1	0	0	7	11	3	0	0	0	0	1	1	0	0	1	2	45
F	18	0	7	8	0	0	0	0	0	8	29	0	0	0	16	30	2	0	0	0	0	0	1	0	0	4	2	107
Subtotal		0	44	28	0	0	0	0	0	27	33	1	0	0	33	45	7	0	0	0	0	4	2	0	0	8	4	236
A	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	19	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
D	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	19	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
F	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
A	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	20	0	0	0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0	8
E	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
F	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Subtotal		0	0	0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4	1	10
A	21	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
B	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2
D	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	3
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	1	0	0	0	1	0	7
A	22	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
B	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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C	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
E	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2
A	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	23	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
A	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	24	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
F	24	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
A	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	25	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
F	25	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
A	26	1	0	0	0	0	0	0	1	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	11
B	26	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
C	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
E	26	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
F	26	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Subtotal		2	0	0	0	0	0	0	1	0	0	0	0	12	0	0	0	0	0	0	1	0	0	0	1	0	0	17
A	27	2	0	0	0	0	0	0	4	0	0	0	0	22	0	0	0	0	0	0	3	0	0	0	2	0	0	33
B	27	0	0	0	0	0	0	0	3	0	0	0	0	5	0	0	0	0	0	0	2	0	0	0	2	0	0	12
C	27	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
D	27	4	0	0	0	0	0	0	3	0	0	0	0	10	0	0	0	0	0	0	6	0	0	0	1	0	0	24
E	27	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	2	0	0	6

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F	27	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Subtotal		7	0	0	0	0	0	0	12	0	0	0	0	43	0	0	0	0	0	0	12	0	0	0	7	0	0	81
A	28	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
B	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
C	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	28	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2
F	28	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	2	0	0	0	1	0	0	7
A	29	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	1	0	0	0	2	0	0	7
B	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	29	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
F	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	1	0	0	0	2	0	0	8
A	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	30	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
A	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	31	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
A	32	0	0	0	0	0	0	0	4	1	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	9
B	32	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
C	32	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	3
D	32	0	1	0	0	0	0	0	1	0	0	0	0	2	1	5	0	0	0	0	1	0	0	0	1	0	0	12
E	32	1	0	0	0	0	0	0	0	1	0	0	0	1	0	10	0	0	0	0	1	0	1	0	1	0	2	18
F	32	1	0	4	0	0	0	0	2	1	3	0	0	5	0	4	0	0	0	0	1	0	0	0	1	1	0	23
Subtotal		3	1	5	0	0	0	0	7	3	4	0	0	9	3	21	0	0	0	0	3	0	1	0	3	1	3	67
A	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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B	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	33	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
A	34	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2
B	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	34	1	0	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	1	0	0	0	0	0	0	7
F	34	3	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Subtotal		4	0	0	0	0	0	0	4	0	0	0	0	6	0	0	0	0	0	0	1	0	0	0	1	0	0	16
A	35	0	0	0	0	0	0	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	7
B	35	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
C	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	35	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	4
E	35	2	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5
F	35	2	0	0	0	0	0	0	5	0	0	0	0	8	0	0	0	0	0	0	1	0	0	0	2	0	0	18
Subtotal		4	0	0	0	0	0	0	7	0	0	0	0	20	0	0	0	0	0	0	2	0	0	0	2	0	0	35
A	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	36	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	3
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	3
A	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	37	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
E	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	37	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Subtotal		0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
A	38	5	0	0	0	0	0	0	28	0	0	0	0	65	0	0	0	0	0	0	32	0	0	0	12	0	0	142
B	38	2	0	0	0	0	0	0	4	0	0	0	0	12	0	0	0	0	0	0	3	0	0	0	2	0	0	23
C	38	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
D	38	1	0	0	0	0	0	0	2	0	0	0	0	14	0	0	0	0	0	0	8	0	0	0	2	0	0	27

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E	38	2	0	0	0	0	0	0	2	0	0	0	0	32	0	0	0	0	0	0	5	0	0	0	4	0	0	45
F	38	1	0	0	0	0	0	0	8	0	0	0	0	39	0	0	0	0	0	0	14	0	0	0	5	0	0	67
Subtotal		11	0	0	0	0	0	0	46	0	0	0	0	163	0	0	0	0	0	0	62	0	0	0	25	0	0	307
A	39	4	0	0	0	0	0	0	3	0	0	0	0	29	0	0	0	0	0	0	3	0	0	0	0	0	0	39
B	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	39	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3
D	39	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0	0	5
E	39	0	0	3	0	0	0	0	1	0	1	0	0	1	0	2	0	0	0	0	1	0	3	0	0	0	1	13
F	39	1	0	4	0	0	0	0	6	1	8	0	0	4	1	5	0	0	0	0	3	0	2	0	1	0	1	37
Subtotal		5	0	7	0	0	0	0	11	1	9	0	0	36	1	7	0	0	0	0	8	0	5	0	4	0	3	97
A	40	4	0	0	0	0	0	0	6	0	0	0	0	20	0	0	0	0	0	0	4	0	0	0	0	0	0	34
B	40	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
C	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	40	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
E	40	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	6
F	40	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Subtotal		7	0	0	0	0	0	0	7	0	0	0	0	33	0	0	0	0	0	0	4	0	0	0	1	0	0	52
A	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
C	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
F	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	3
A	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	42	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
C	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total		50	411	394	15	1	4	3	132	94	143	4	1	455	189	444	32	2	1	1	122	26	32	1	58	21	32	2668

APPENDIX 2. Taxonomic list of molluscs, Minimum Number of Shells (MNS) and Minimum Number of Individuals (MNI) from trenches A-F, DM site, Dos Mosquises Island, Los Roques Archipelago.

Taxa	DM/A			DM/B			DM/C			DM/D			DM/E			DM/F			MNS	MNI
	0-20	20-40	Subt.	0-20	20-40	Subt.	0-20	20-40	Subt.	0-20	20-40	Subt.	0-20	20-40	Subt.	0-20	20-40	Subt.		
Aequipecten sp.	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Americardia media (Linné, 1758)	4	0	4	3	2	5	1	0	1	0	0	0	0	0	0	0	0	0	10	5
Amphineurans	90	5	95	80	475	555	214	625	839	5	3	8	2	4	6	17	0	17	1520	190
Anadara notabilis (Röding 1798)	6	0	6	8	2	10	6	1	7	0	0	0	0	0	0	0	0	0	23	11
Anadara sp.	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Arca zebra (Swainson, 1833)	26	0	26	0	19	19	0	10	10	0	0	0	0	0	0	1	0	1	56	28
Arcopagia fausta Pulteney, 1799	17	0	17	12	25	37	0	11	11	0	0	0	0	0	0	0	0	0	65	32
Asaphis deflorata (Linné, 1758)	1	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	3	1
Astraea sp.	39	0	39	0	20	20	0	16	16	1	0	1	0	0	0	0	0	0	76	76
Bulla striata Bruguiére, 1792	0	0	0	2	1	3	0	3	3	0	0	0	0	0	0	0	0	0	6	6
Bursa corrugata (Perry , 1811)	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Cassis flammea (Linné, 1758)	0	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Chama sp.	61	0	61	0	39	39	0	48	48	1	0	1	4	0	4	2	1	3	156	78
Chamidae	0	1	1	1	2	3	1	2	3	2	5	7	0	3	3	3	12	15	32	16
Charonia variegata (Lamarck, 1816)	2	0	2	5	0	5	0	1	1	0	0	0	0	0	0	0	0	0	8	8
Chicoreus brevifrons (Lamarck, 1822)	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
Chione paphia (Linné, 1758)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Chlamys imbricata (Gmelin, 1791)	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Cittarium pica (Linné, 1758)	24	0	24	0	58	58	0	79	79	1	0	1	0	3	3	11	0	11	176	176
Codakia orbicularis (Linné, 1758)	113	0	113	48	133	181	12	104	116	2	0	2	0	2	2	2	16	18	432	216
Columbellidae	98	12	110	3	2	5	0	2	2	0	0	0	0	0	0	0	0	0	117	117
Conus sp.	18	0	18	1	10	11	0	10	10	0	0	0	0	0	0	0	0	0	39	39
Crepidula fornicta (Linné, 1758)	12	39	51	32	65	97	53	118	171	13	26	39	2	18	20	17	5	22	400	400
Cymatium pileare (Linné, 1758)	0	1	1	3	0	3	0	0	0	0	0	0	1	0	1	0	0	0	5	5
Cyphoma gibbosum (Linné, 1758)	4	0	4	0	2	2	1	1	2	0	0	0	0	0	0	0	0	0	8	8
Cypraea cinerea Gmelin, 1791	0	6	6	12	3	15	0	2	2	0	0	0	0	0	0	0	0	0	23	23
Cypraea sp.	0	11	11	0	9	9	2	7	9	0	0	0	0	0	0	0	0	0	29	29
Cypraea spurca acicularis Gmelin, 1791	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	2
Cypraea zebra (Linné, 1758)	16	1	17	12	29	41	1	3	4	0	0	0	0	0	0	0	0	0	62	62
Cypraecassis testiculus (Linné, 1758)	2	0	2	3	0	3	1	0	1	0	0	0	0	0	0	0	0	0	6	6
Diodora listeri (Orbigny, 1842)	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Fasciolaria tulipa (Linné, 1758)	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Glycymeris americana (DeFrance, 1829)	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Glycymeris decussata (Linné, 1758)	26	0	26	0	12	12	0	10	10	0	0	0	0	4	4	0	0	0	52	26
Glycymeris pectinata (Gmelin, 1791)	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1

APPENDIX 2. (cont.)

Glycymeris undata (Linné, 1758)	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1
Haustellum messorius (Sowerby, 1841	0	0	0	3	0	3	1	0	1	0	0	0	2	0	2	0	0	0	6	0
Laevicardium laevigatum (Linné, 1758)	4	0	4	5	1	6	5	1	6	0	0	0	0	0	0	0	0	0	16	8
Latirus infundibulum (Gmelin, 1791)	0	2	2	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	5	5
Leucozonia nassa (Gmelin, 1791)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1
Leucozonia ocellata (Gmelin, 1791)	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Lithopoma caelata (Gmelin, 1791)	22	0	22	25	9	34	10	4	14	0	0	0	0	0	0	0	0	0	70	0
Lithopoma sp.	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Lithopoma tecta (Lightfoot, 1786)	3	0	3	4	4	8	1	0	1	0	0	0	0	0	0	0	0	0	12	0
Lopha frons (Linné, 1758)	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	7	0
Lucina pectinata (Gmelin, 1791)	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1
Lyropecten nodosus (Linné, 1758)	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3	1
Macrocallista maculata (Linné, 1758)	2	0	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3	1
Marginella prunum (Gmelin, 1791)	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Marginellidae	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Melongena melongena (Linné, 1758)	3	0	3	1	3	4	0	19	19	0	0	0	3	0	3	0	0	0	29	29
Modiolus americanus (Leach, 1815)	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Murex macgintyi M.Smith, 1938	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2
Natica canrena (Linné, 1758)	0	0	0	2	0	2	1	0	1	0	0	0	0	0	0	0	0	0	3	3
Nerita peloronta (Linné, 1758)	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Nerita versicolor Gmelin, 1791	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Oliva reticularis Lamarck, 1810	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Oliva sp.	26	6	32	5	69	74	1	24	25	0	0	0	1	1	2	0	2	2	135	135
Olivella sp.	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Olivellidae	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1
Pecten ziczac (Linné, 1758)	3	0	3	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	6	3
Pectinidae	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1
Periglypta listeri (Gray, 1838)	14	0	14	3	11	14	0	5	5	0	0	0	0	0	0	0	0	0	33	16
Phalium granulatum (Born, 1778)	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1
Pinctada imbricata Röding, 1798	0	0	0	1	14	15	0	1	1	0	0	0	0	0	0	0	0	0	16	8
Pinna carnea Gmelin, 1791	0	0	0	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	3	1
Pisania pusio (Linné, 1758)	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Polinices lacteus (Building, 1834)	1	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Pseudochama radians (Lamarck, 1819)	9	0	9	4	1	5	6	1	7	0	0	0	2	0	2	0	0	0	23	11
Pteria colymbus (Röding, 1798)	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	4	2
Spondylus americanus Hermann, 1781	1	0	1	7	22	29	8	6	14	0	0	0	3	0	3	0	0	0	47	23
Strombus costatus Gmelin, 1791	0	3	3	1	6	7	0	6	6	0	0	0	2	4	6	0	0	0	22	22
Strombus gallus (Linné, 1758)	0	5	5	2	3	5	0	2	2	0	0	0	0	0	0	0	0	0	12	12
Strombus gigas Linné, 1758	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Strombus pugilis (Linné, 1758)	3	0	3	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	5	5
Strombus raninus Gmelin, 1791	2	4	6	5	6	11	7	8	15	0	0	0	0	0	0	0	0	0	32	32

APPENDIX 2. (cont.)

Tellina listeri Röding, 1798	1	0	1	0	5	5	0	1	1	0	0	0	0	0	0	0	0	0	7	3
Tellina radiata Linné, 1758	2	0	2	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	14	7
Thais deltoidea (Lamarck, 1822)	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	2	2
Thais rustica (Lamarck, 1822)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Tivela mactroides (Born, 1778)	4	1	5	6	15	21	2	5	7	0	0	0	0	2	2	1	1	2	37	18
Tonna maculosa (Dillwyn, 1817)	1	0	1	3	2	5	2	1	3	0	0	0	0	0	0	0	0	0	9	9
Trachycardium isocardia (Linné, 1758)	1	0	1	0	1	1	0	2	2	0	0	0	0	0	0	0	0	0	4	2
Trachycardium magnum (Linné, 1758)	3	0	3	7	2	9	1	1	2	0	0	0	0	0	0	0	0	0	14	7
Trachycardium muricatum (Linné, 1758)	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1
Trachycardium sp.	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3	1
Turbo canaliculatus Hermann, 1781	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Vasum capitellum (Linné, 1758)	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Ventricolaria rigida (Dillwyn, 1817)	8	0	8	4	4	8	0	3	3	0	0	0	0	0	0	0	0	0	19	8
Vermetidae	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Voluta musica (Linné, 1758)	0	0	0	1	2	3	3	0	3	0	0	0	0	0	0	1	0	1	7	7
Total	681	101	782	323	1146	1469	342	1151	1493	27	34	61	22	42	64	56	37	93	3962	1982

FIGURE 1. *North-central Venezuela within the Caribbean.*

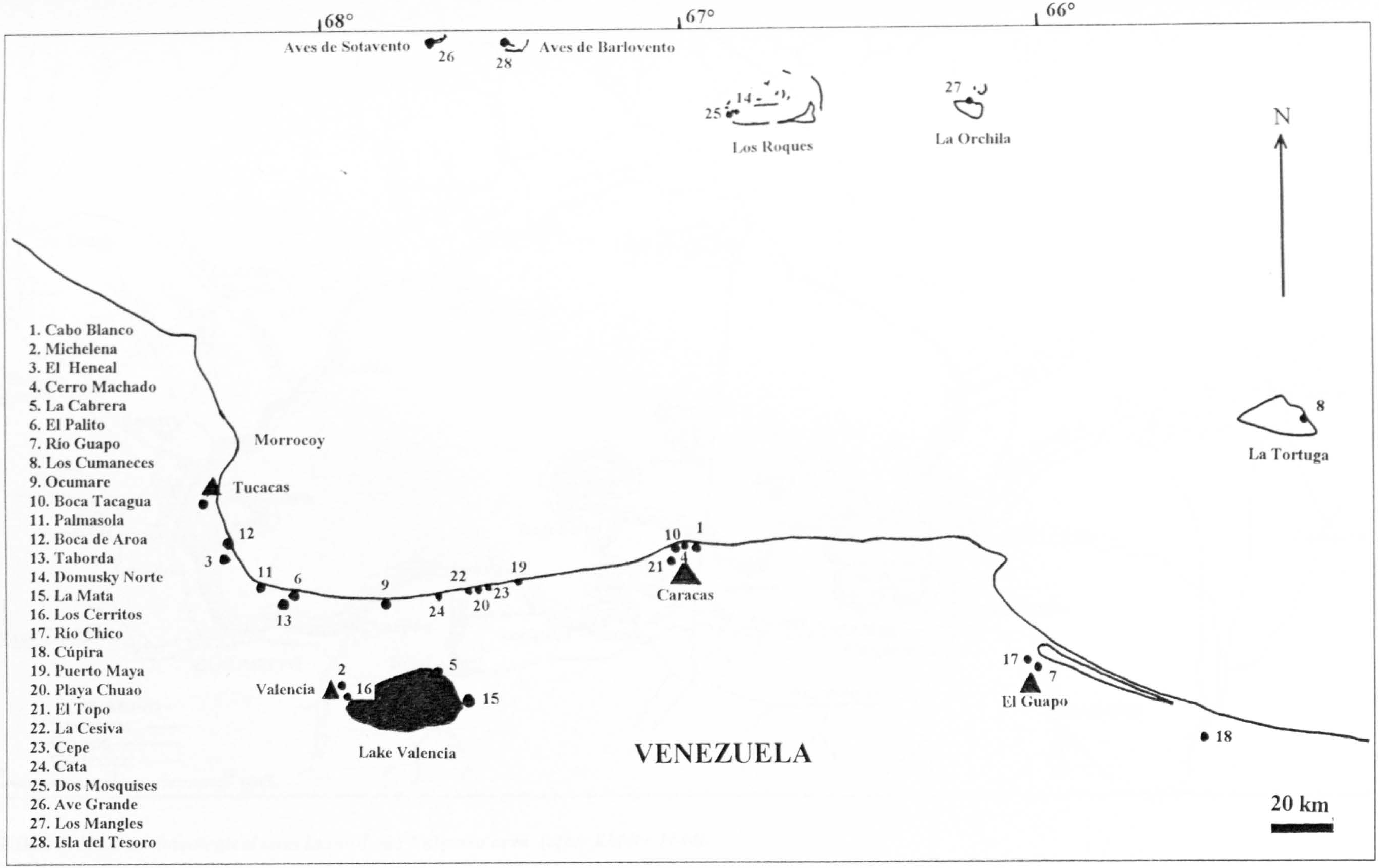


FIGURE 2. *Main archaeological sites in north-central Venezuela.*

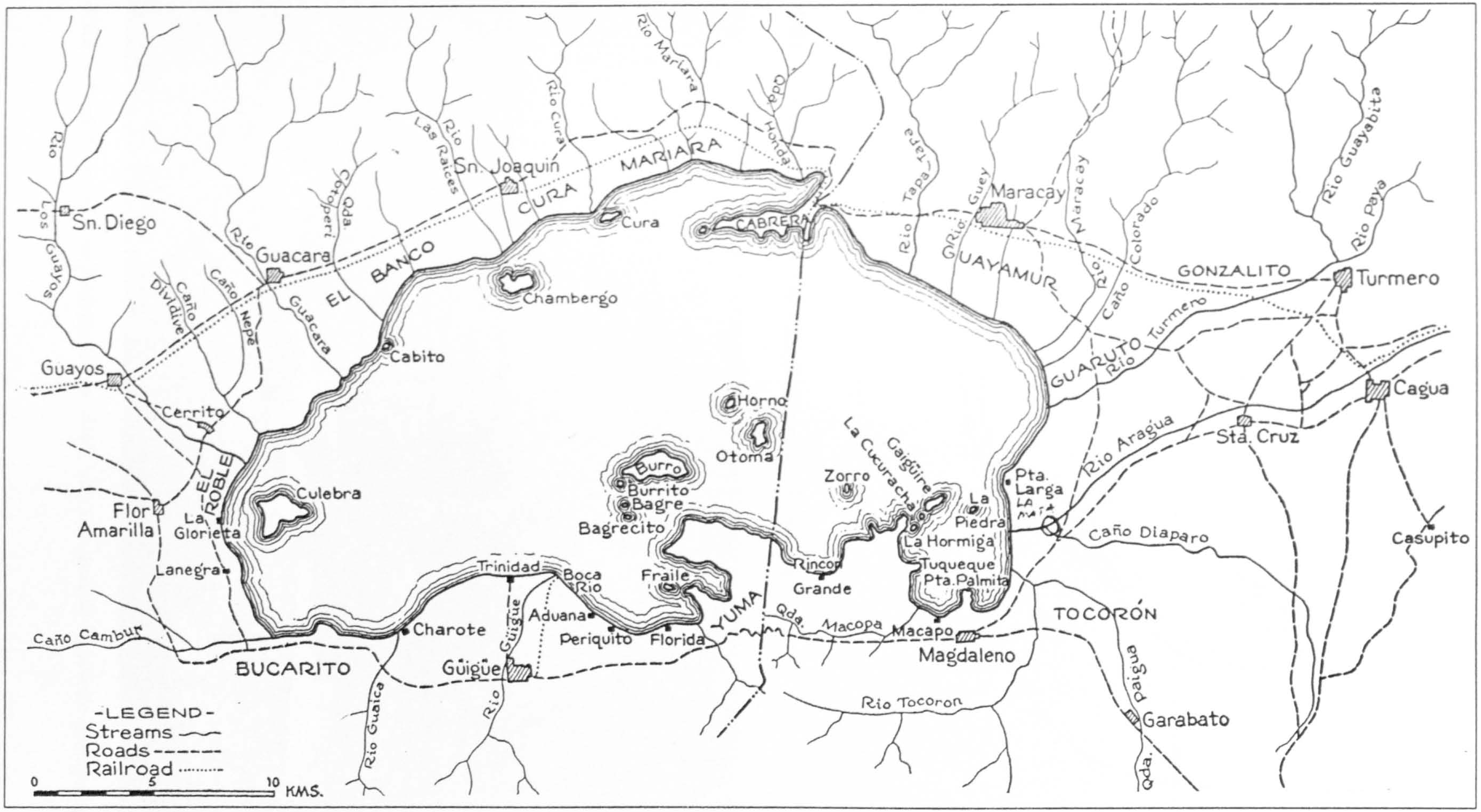


FIGURE 3. *Main archaeological sites in the Lake Valencia area (after Kidder 1944).*

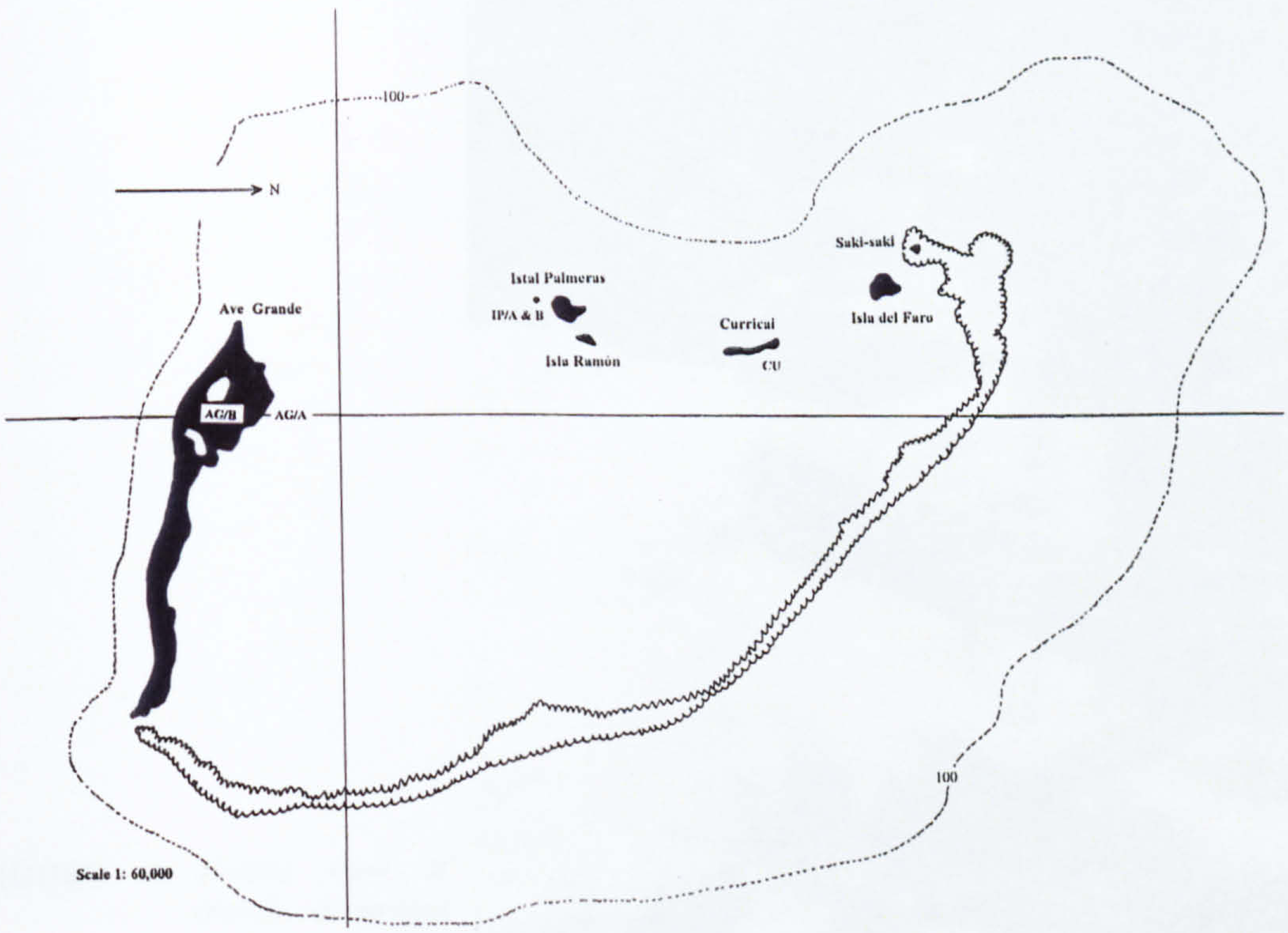


FIGURE 4. ***Amerindian sites in Las Aves de Sotavento Archipelago.***

FIGURE 5. ***Partial view of trench excavated at AG/A site, Las Aves de Sotavento Archipelago.***

FIGURE 6. *Partial view of trench excavated at AG/A site, Las Aves de Sotavento Archipelago.*

FIGURE 7. *Selected profile at AG/A site.*

FIGURE 8. *Selection of lithic and bone artefacts from AG/A site.*

FIGURE 9. *Corrugated rims from AG/A site.*

FIGURE 10. *Painted Dabajuroid pottery from AG/A site.*

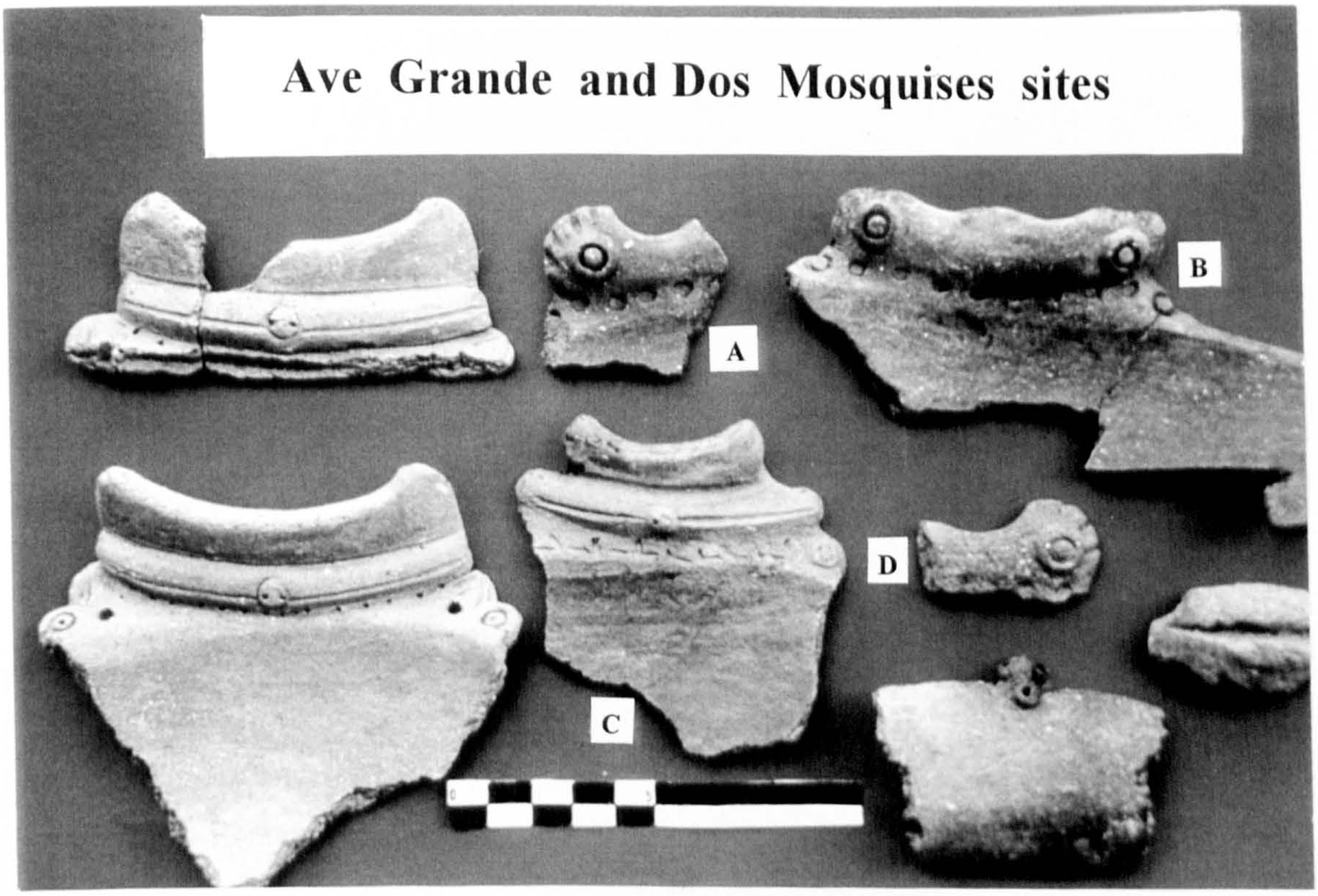


FIGURE 11. *Modelled Valencioid adornos from AG/A (A-D) and DM sites.*

FIGURE 12. ***Surface view of the deposit at Isla Palmeras, IP/A site, Las Aves de Sotavento Archipelago.***

FIGURE 13. ***Excavations at IP/A site.***

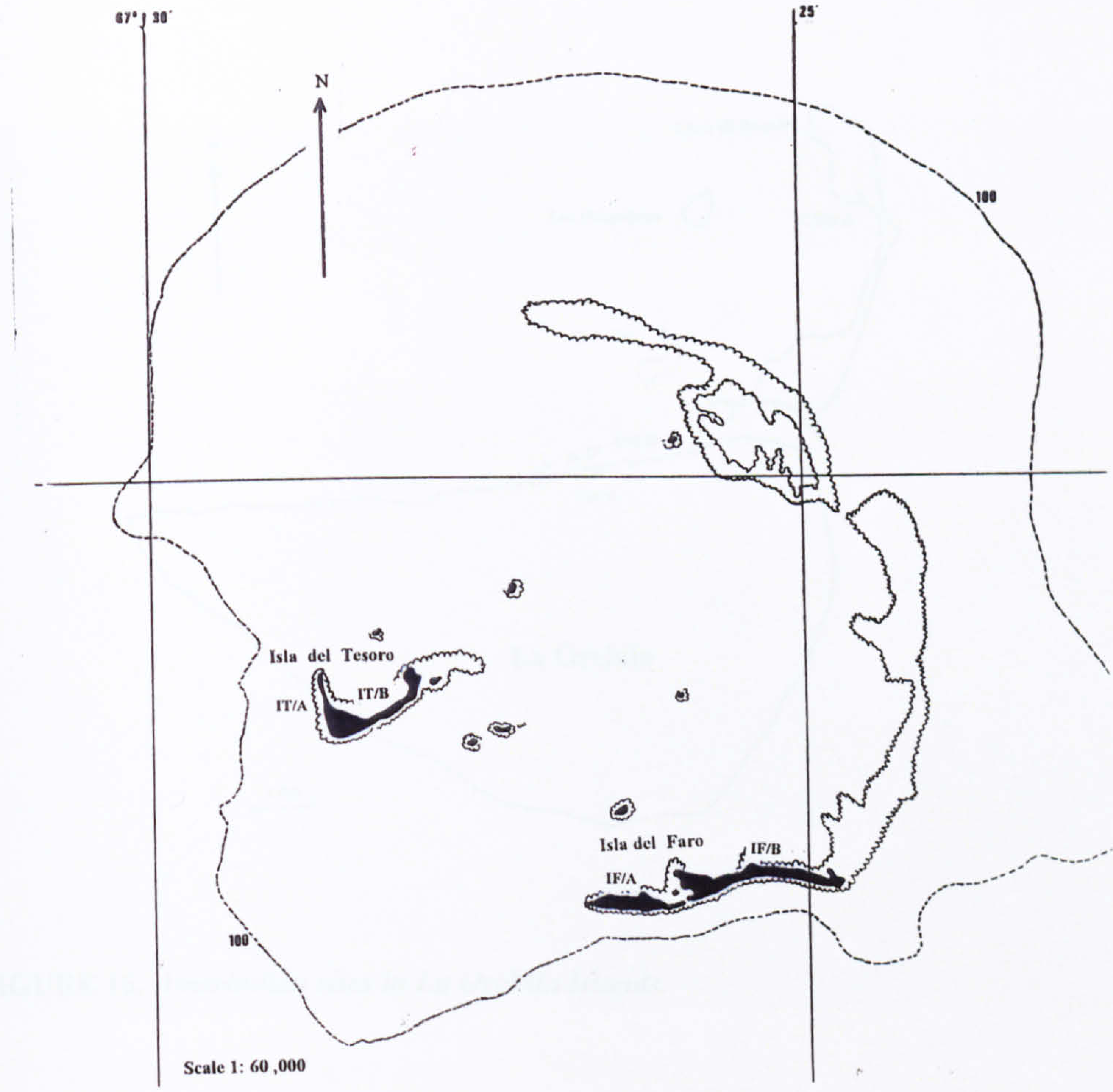


FIGURE 14. *Amerindian sites in Las Aves de Barlovento Archipelago.*

FIGURE 15. *Excavations at Isla del Tesoro, IT/B, Las Aves de Barlovento Archipelago.*

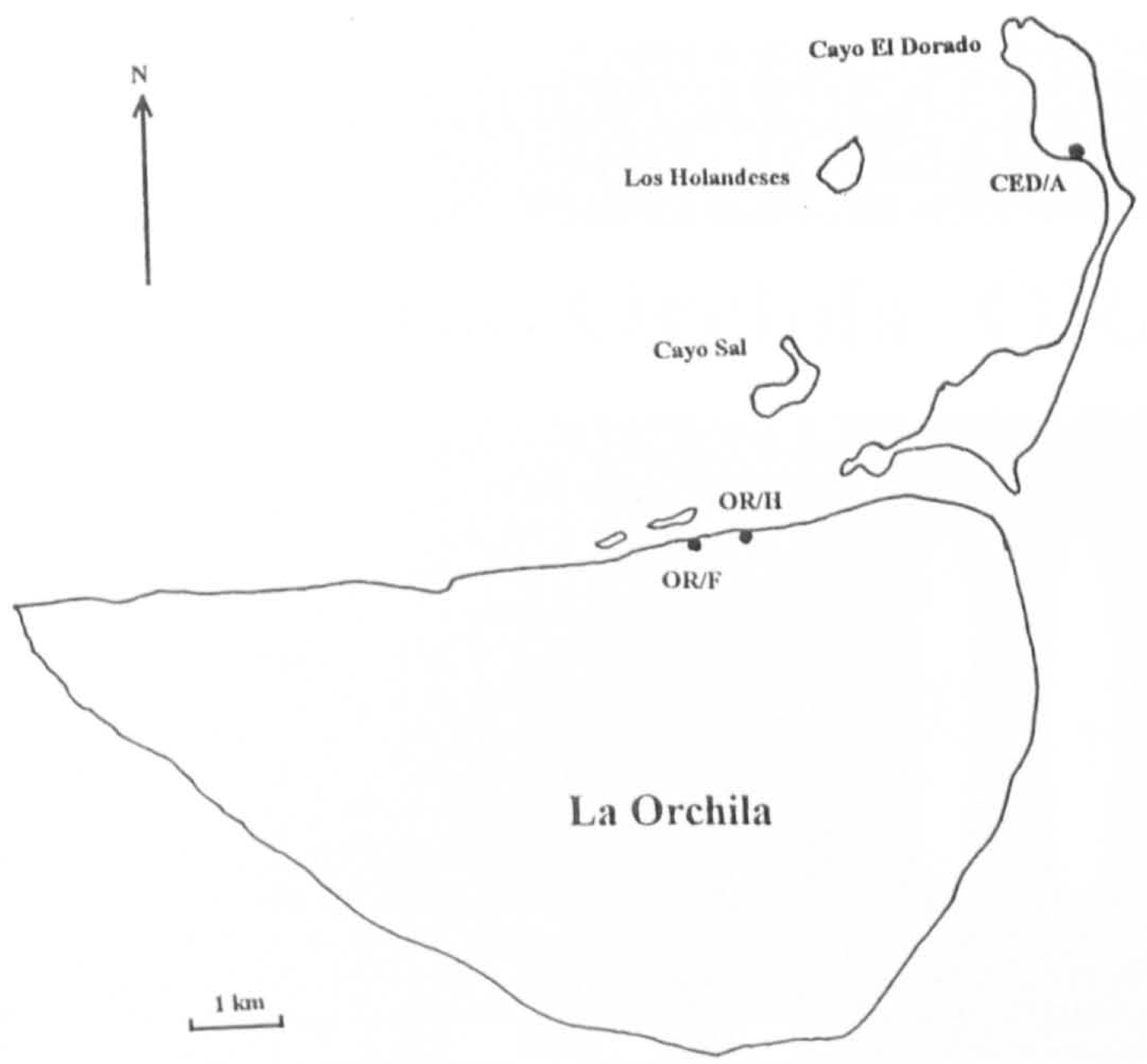


FIGURE 16. *Amerindian sites in La Orchila Islands.*

FIGURE 17. *Excavations at Los Mangles, OR/F site, La Orchila Island.*

FIGURE 18. *Selection of artefacts from OR/F site.*

FIGURE 19. *Decorated neck of a globular jar from OR/F site.*

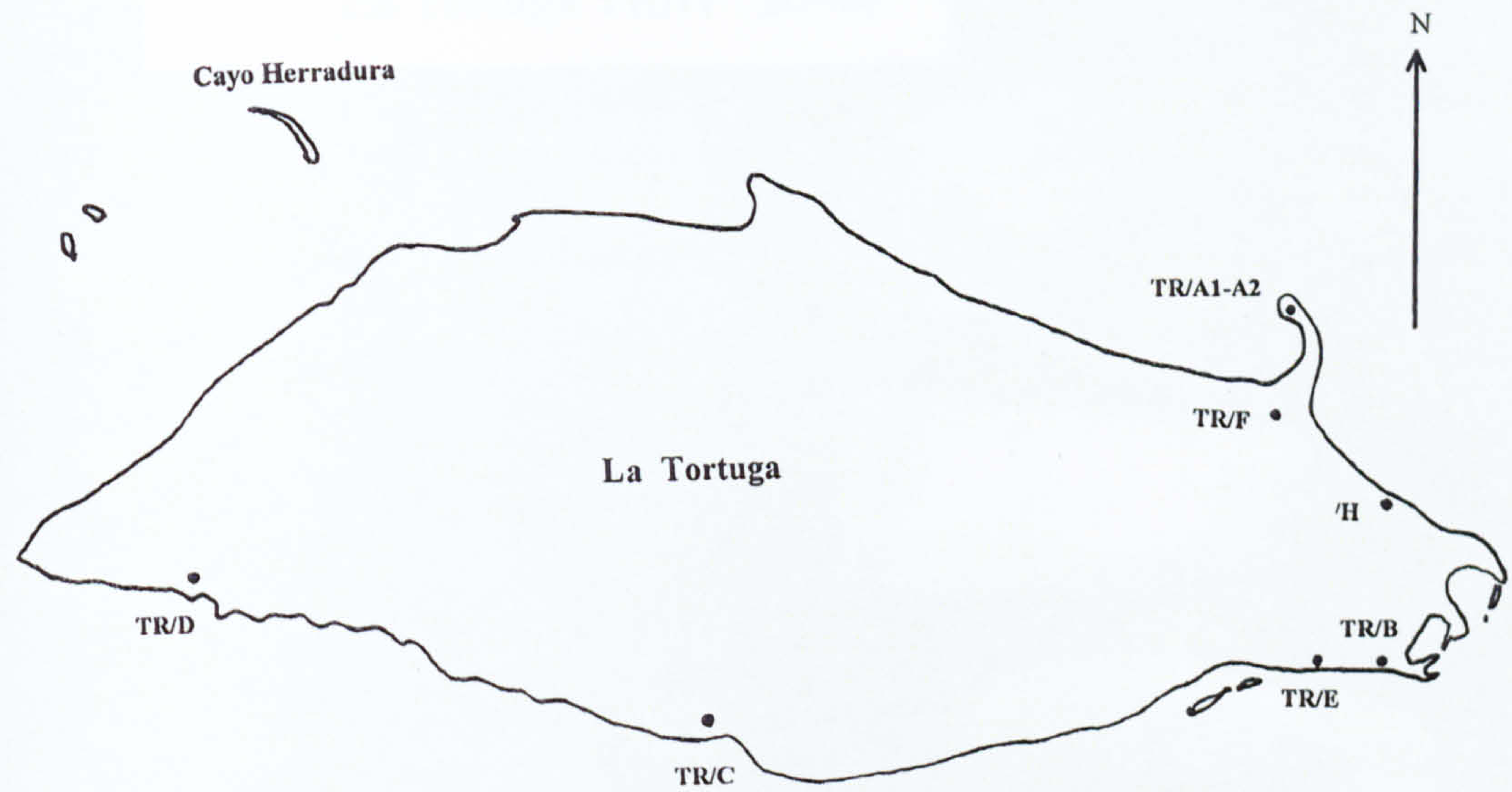


FIGURE 20. ***Amerindian sites in La Tortuga Island.***

FIGURE 21. ***Excavations at Los Cumaneces, TR/H site, La Tortuga Island.***

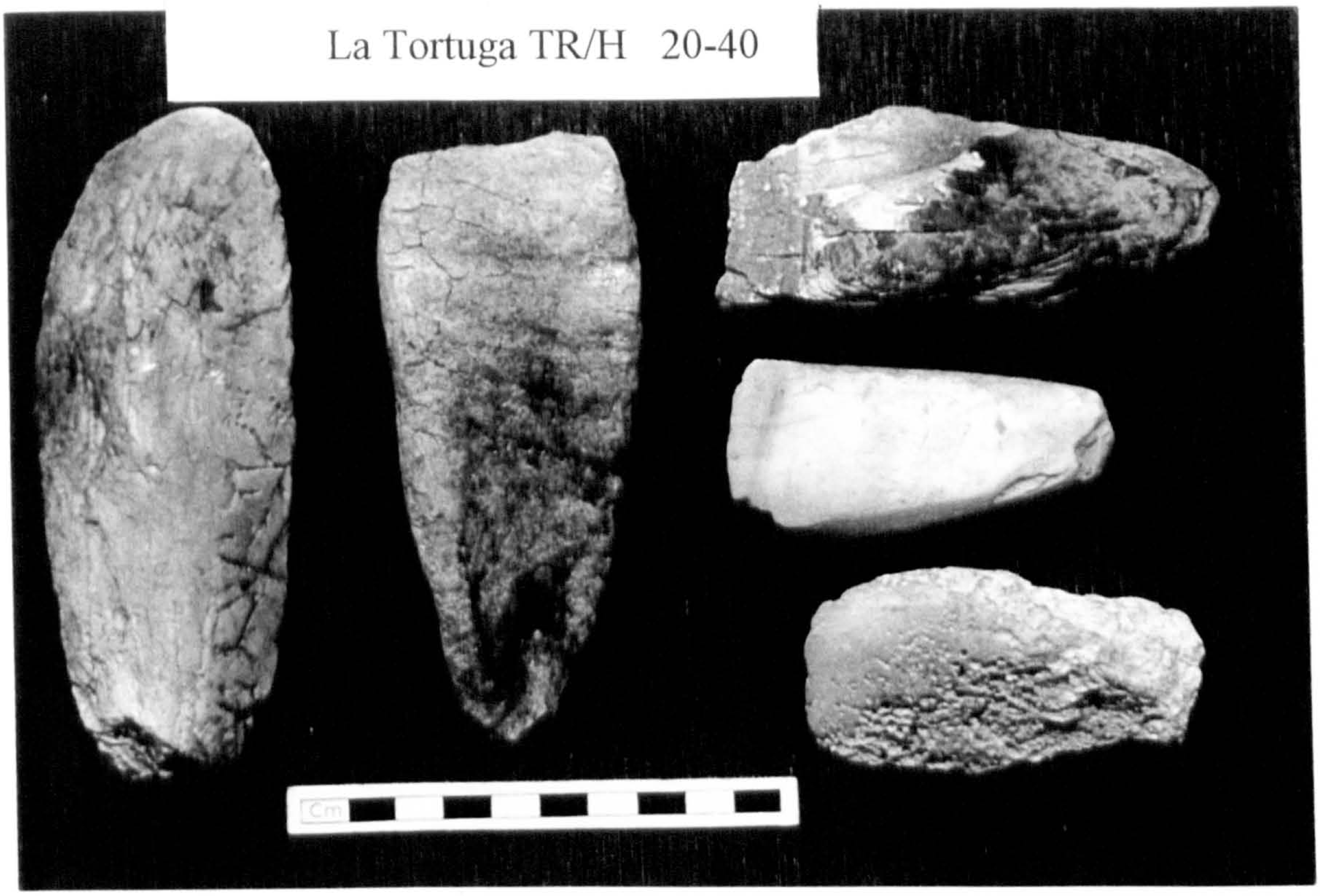


FIGURE 22. *Strombus gigas shell adzes from TR/H site.*

FIGURE 23. *Sample of decorated pottery from TR/H site.*

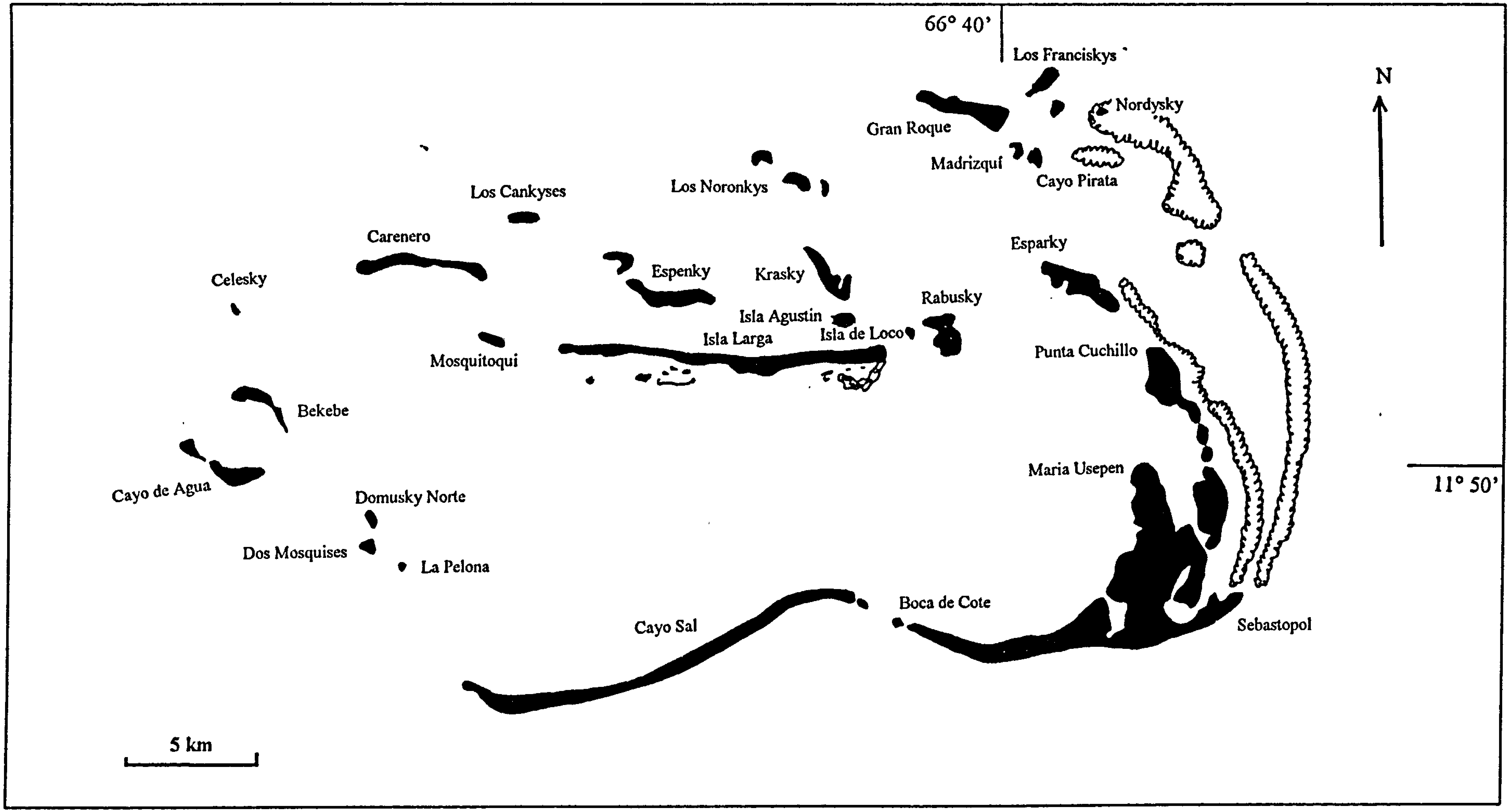


FIGURE 24. *The Los Roques Archipelago.*

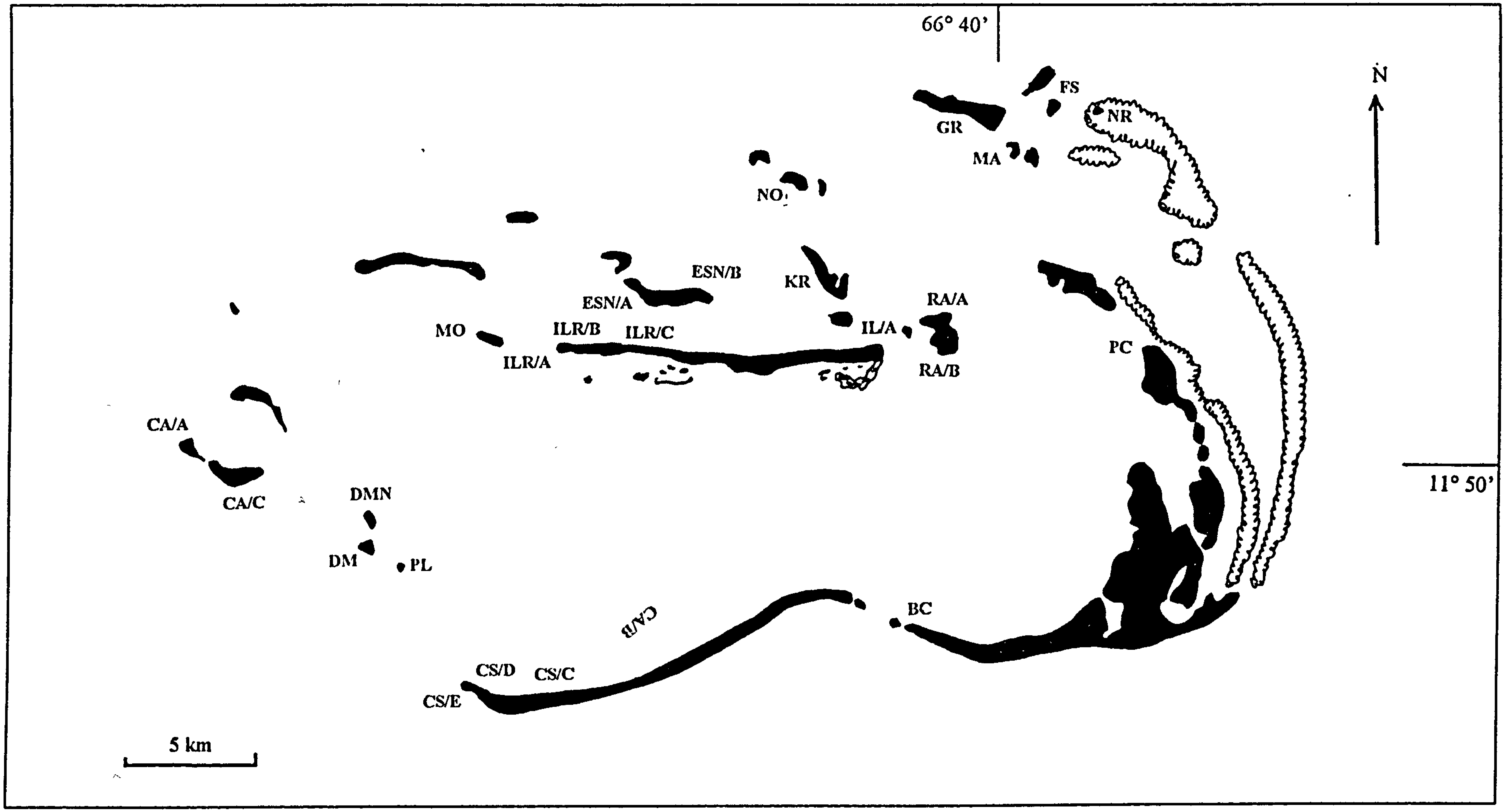


FIGURE 25. *Amerindian sites in Los Roques Archipelago.*

FIGURE 26. ***Aerial view of Dos Mosquises (in foreground) and Domusky Norte Island in the distance.***

FIGURE 27. ***Northern coast of Dos Mosquises Island.***

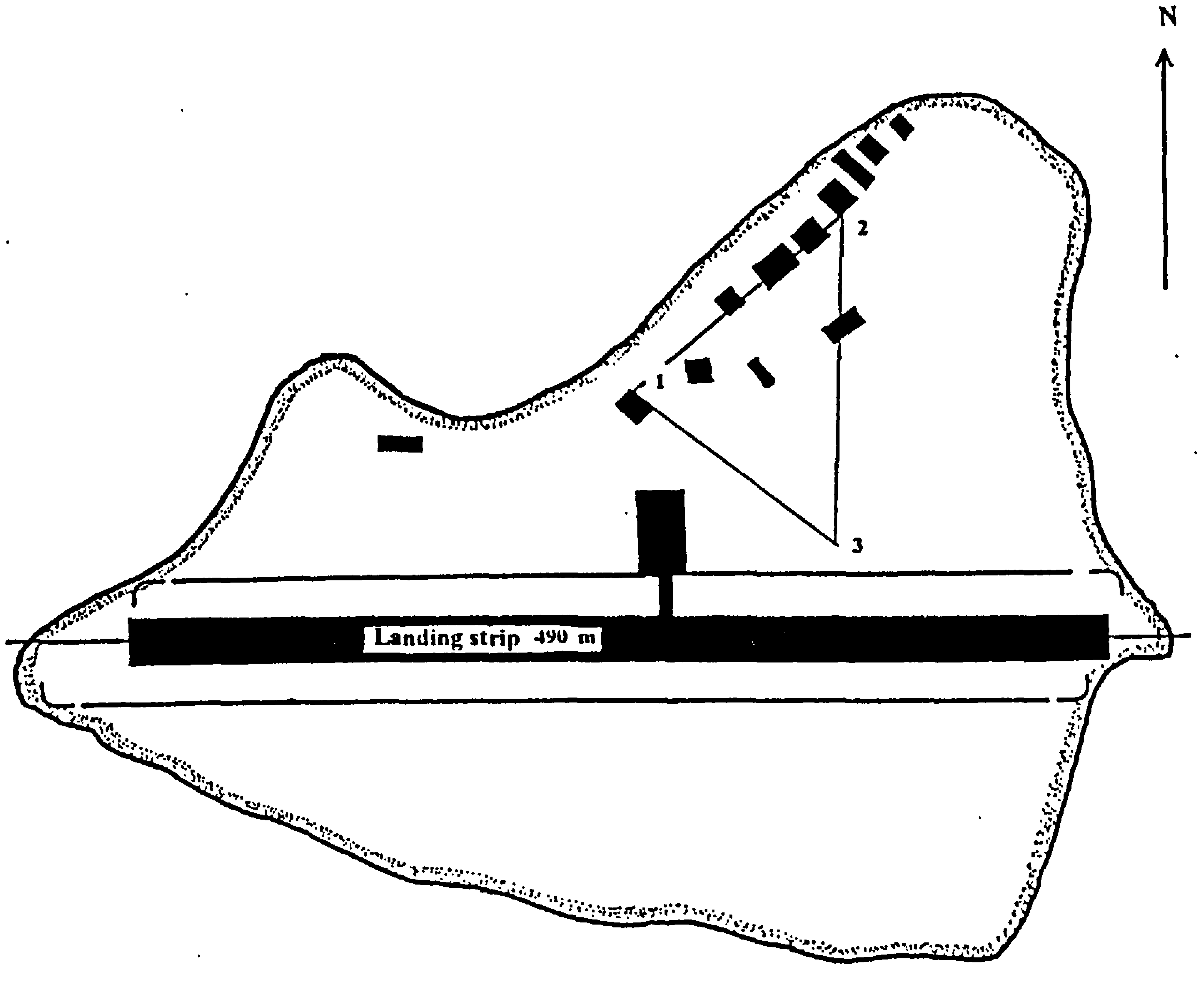


FIGURE 28. *Plan of Dos Mosquises Island and location of the DM site.*

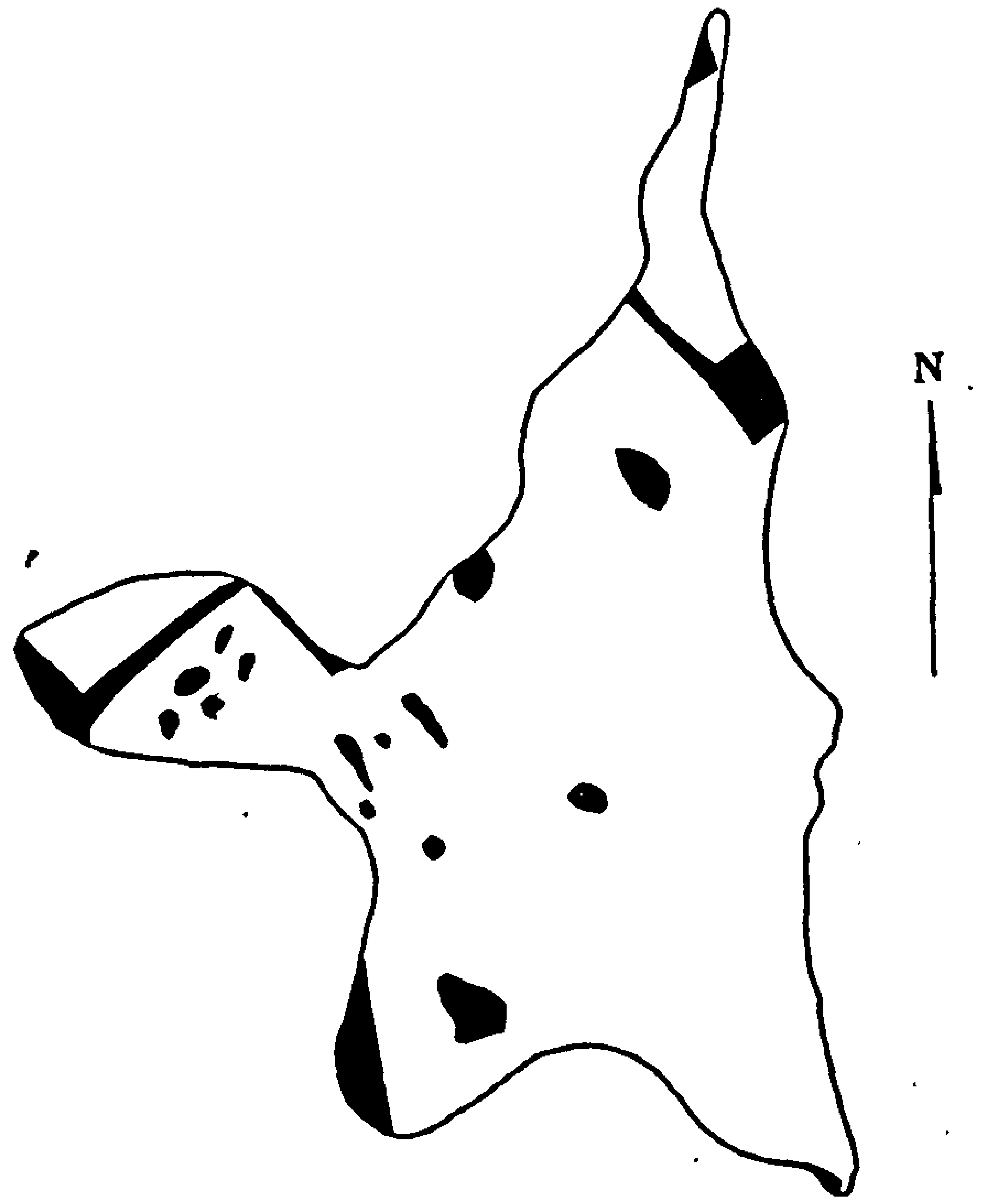


FIGURE 29. *The areas of major anthropic alteration in the DM site (situation in 1982).*

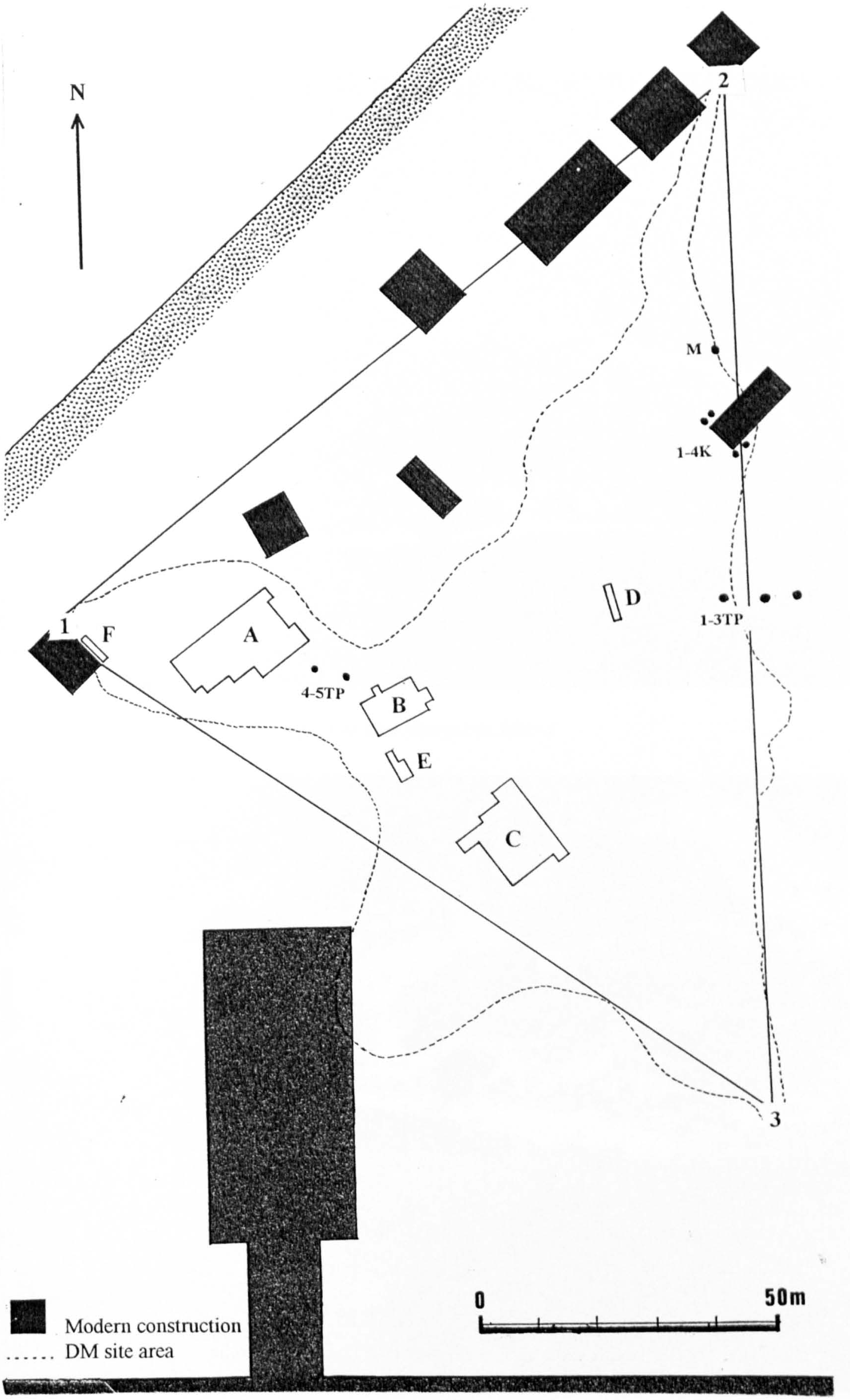


FIGURE 30. ***General plan of excavations at DM site.***

FIGURE 31. *Aerial view of northern part of Dos Mosquises Island.*

FIGURE 32. *Aerial view of north-eastern part of Dos Mosquises Island featuring palaeoshorelines.*

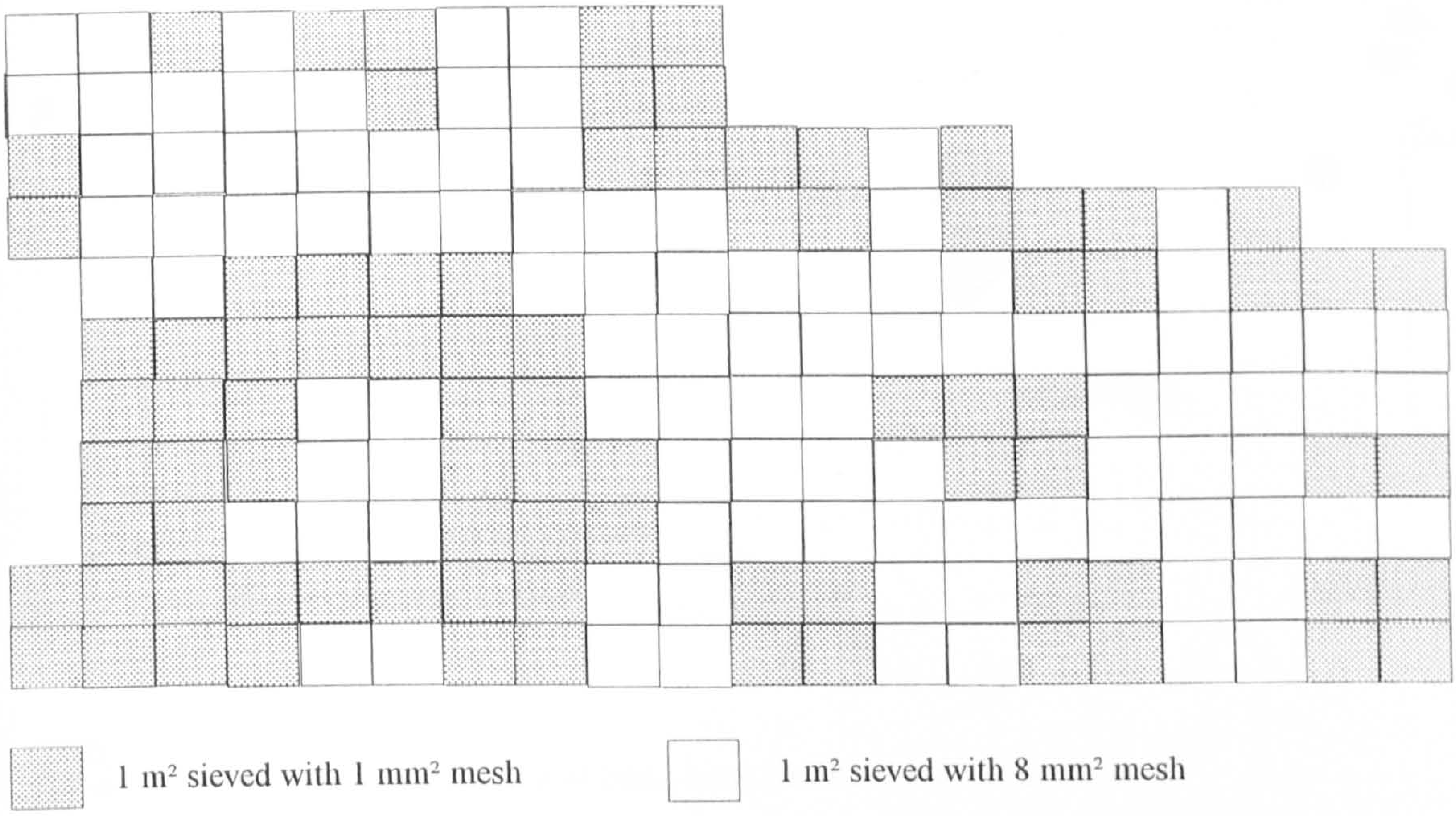
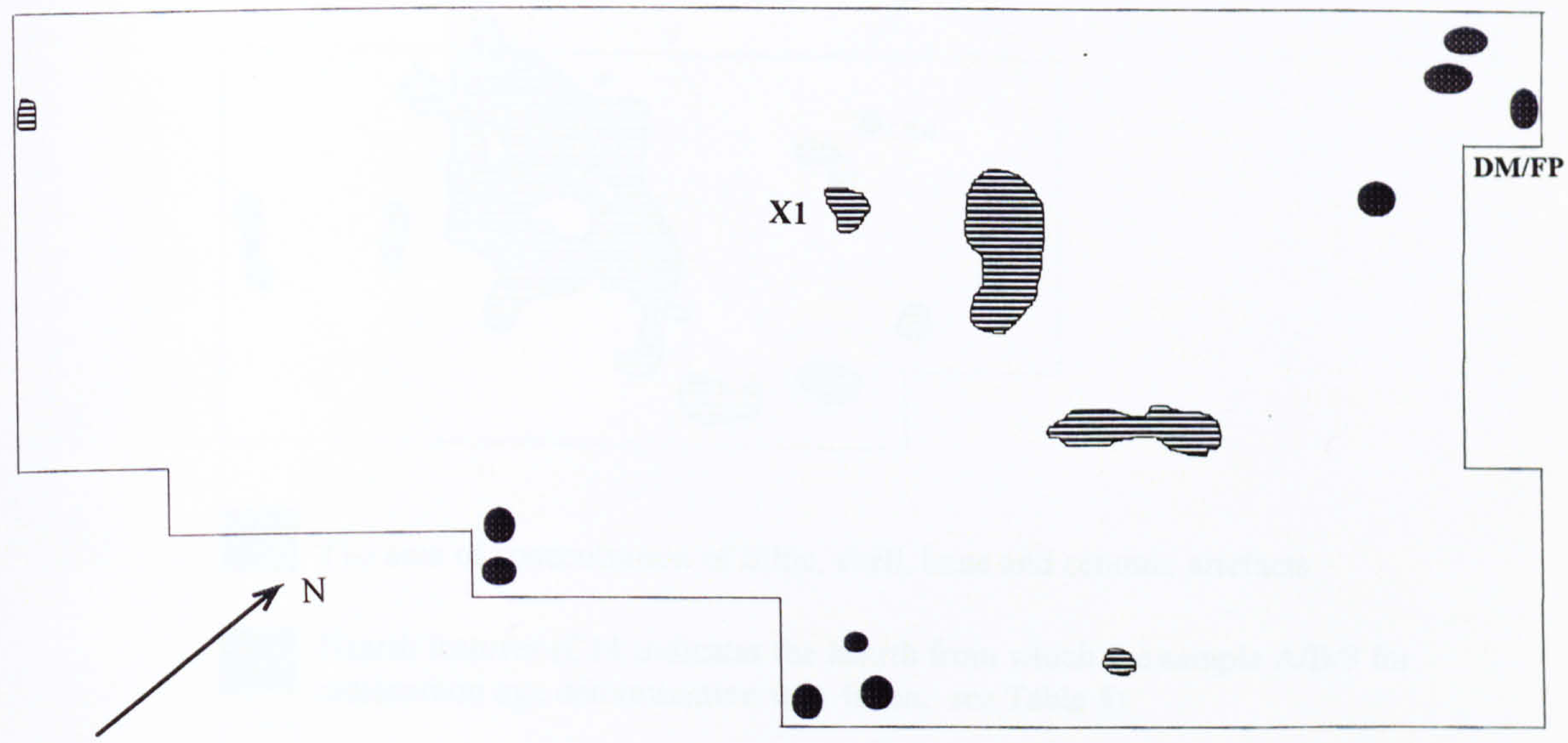


FIGURE 33. ***Differential sieving in Trench A, DM site.***

FIGURE 34. ***Base of hearth made of coral stones (feature DM/FP; see Table 16).***

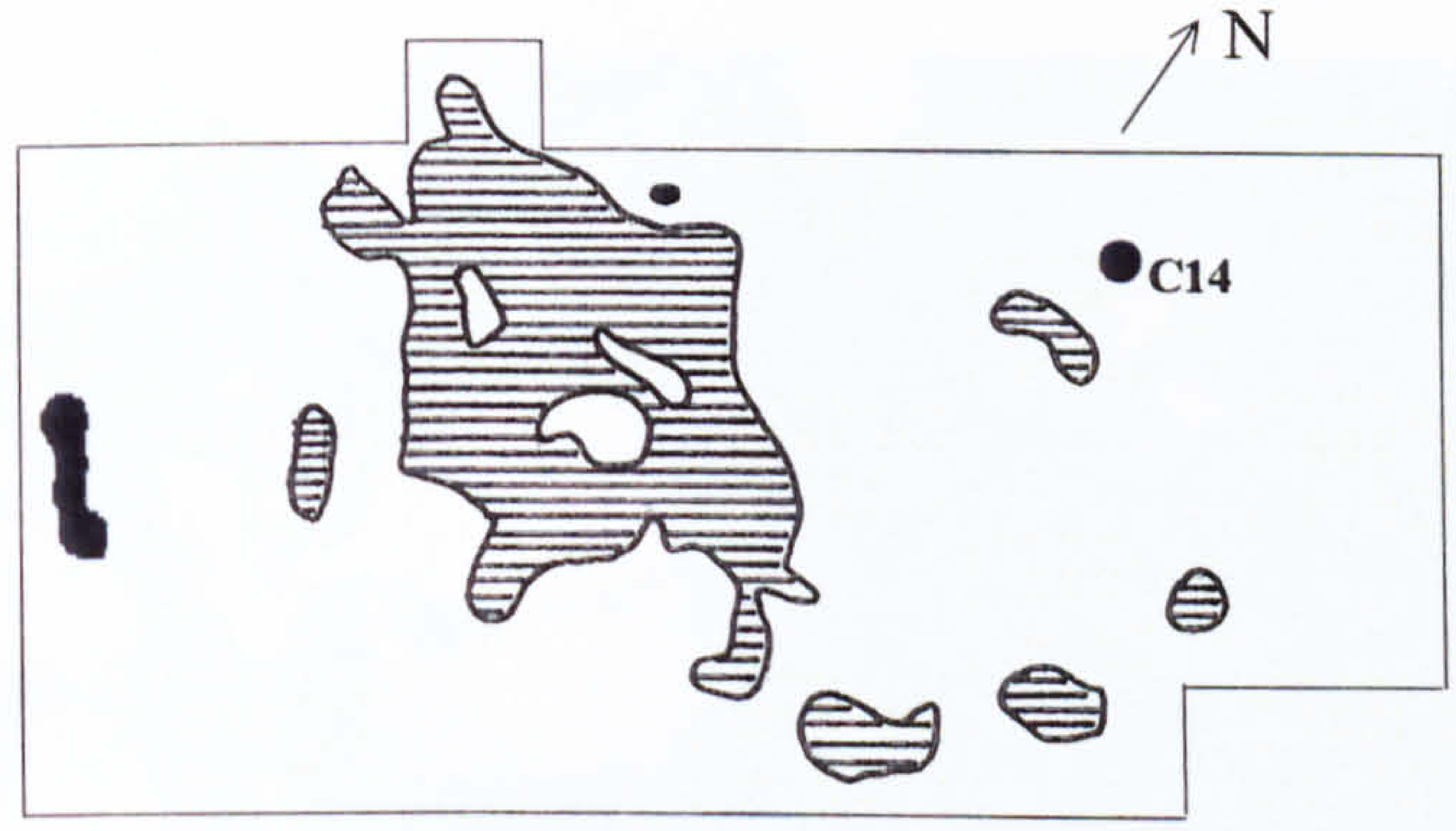


Areas of major concentration of lithic, bone, shell and ceramic artefacts

Hearth feature (for the description of the feature DM/FP see Table 16)

FIGURE 35. ***Hearths and areas of high artefactual density in Trench A, DM site.***

FIGURE 36. ***Partial view of area of high artefactual density in Trench A, DM site.***



The area of concentration of lithic, shell, bone and ceramic artefacts

Hearth features (C14 indicates the hearth from which the sample A/B/9 for radiocarbon age determination was taken; see Table 4)

1 m²

FIGURE 37. ***Hearths and areas of high artefactual density in Trench B, DM site.***

FIGURE 38. ***Partial view of area of high artefactual density in Trench B, DM site.***

FIGURE 39. *Partial view of area of high artefactual density in Trench B, DM site, featuring Tivela spp. pendant and Plekocheilus spp. whistle surrounded by ceramic artefacts.*

FIGURE 40. *Micro-context from Trench B, DM site, showing anthropomorphic vessels and Labyrinthus plicatus pendant.*

FIGURE 41. ***Micro-context from Trench B, DM site, showing ceramic vessels standing on flat coral stone, Strophocheilus spp. and Codakia spp. shells.***

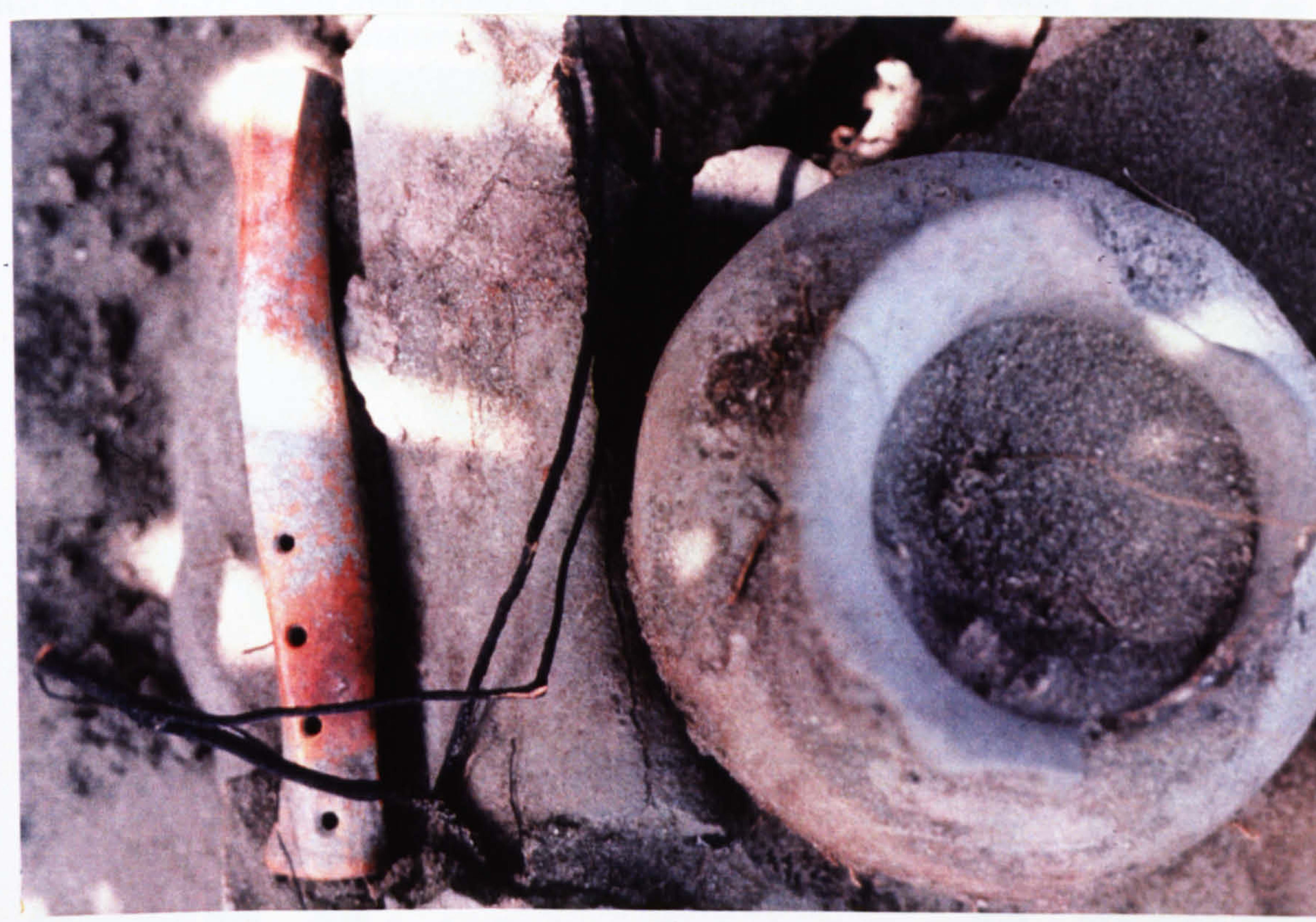


FIGURE 42. ***Micro-context from Trench B, DM site, showing ceramic vessel, bone flute and turtle bone.***

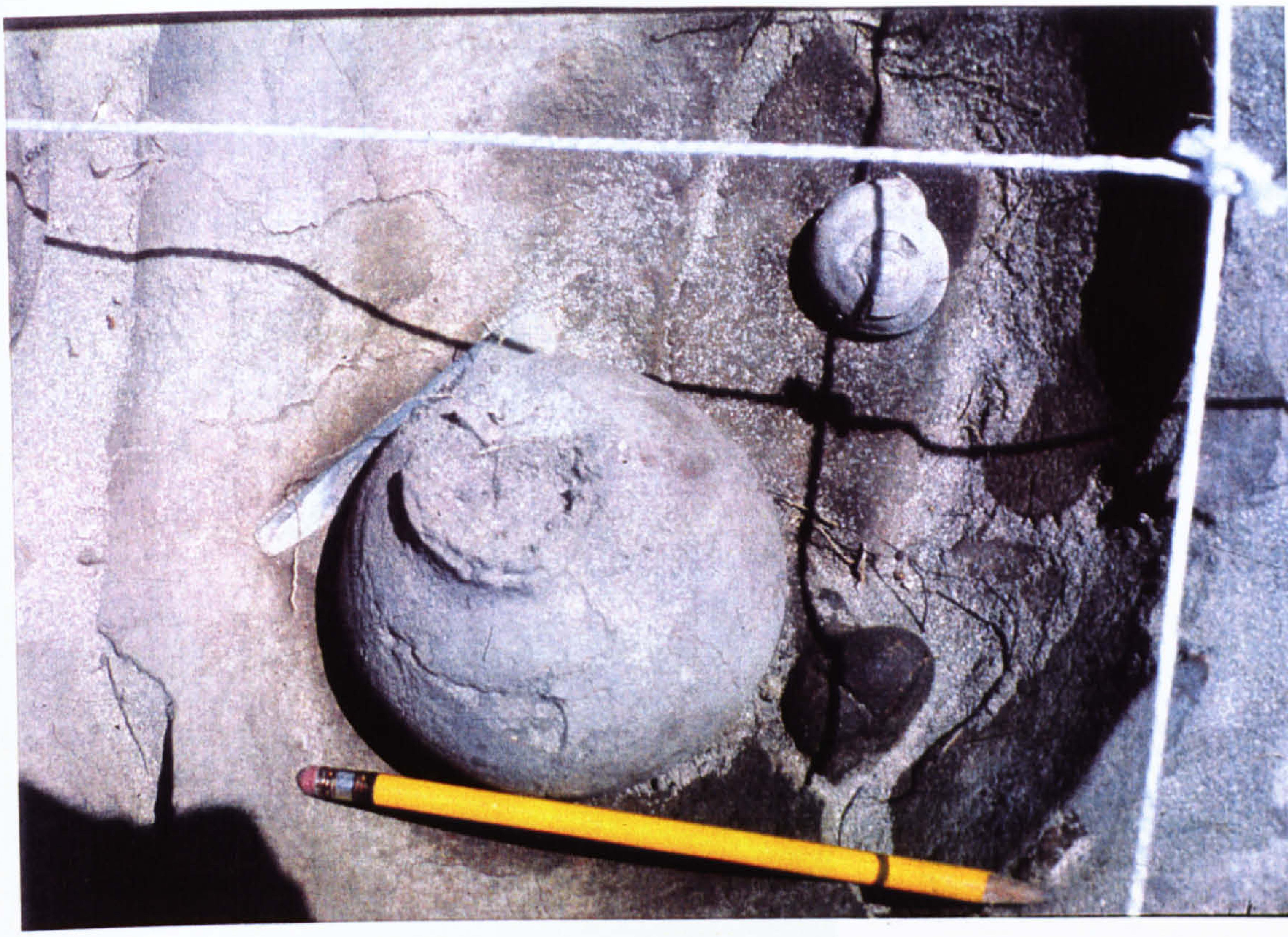


FIGURE 43. *Micro-context from Trench B, DM site, showing small ceramic vessel, Labyrinthus spp. and stone pendants and ceramic figurine, all lying in a fragment of large olla.*

FIGURE 44. *Pendants made of Labyrinthus spp. (top row), Tivela mactroides (middle row) and Olivellidae (Trench B, DM site).*

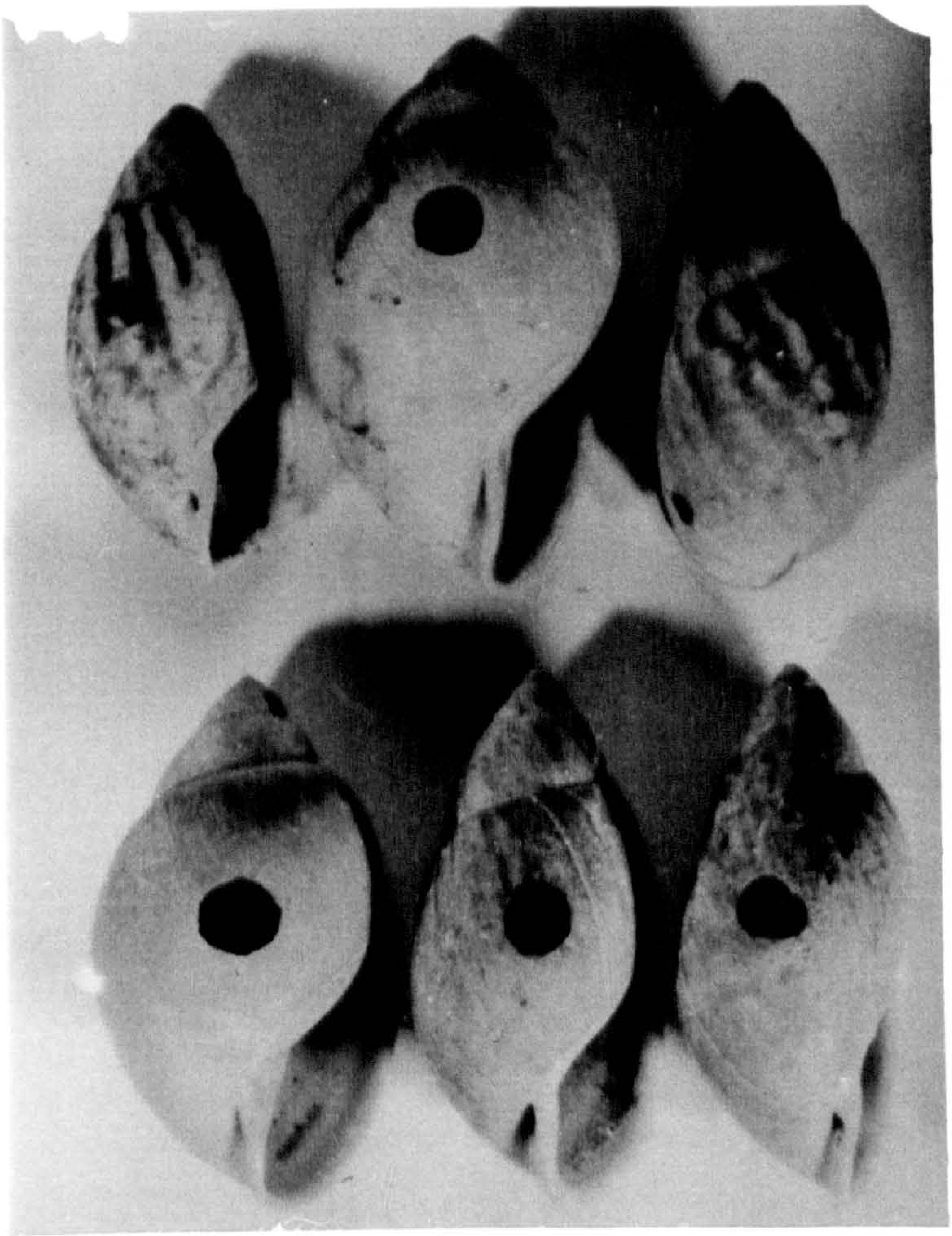


FIGURE 45. *Plekocheilus spp. and Strophocheilus spp. whistles from DM site.*

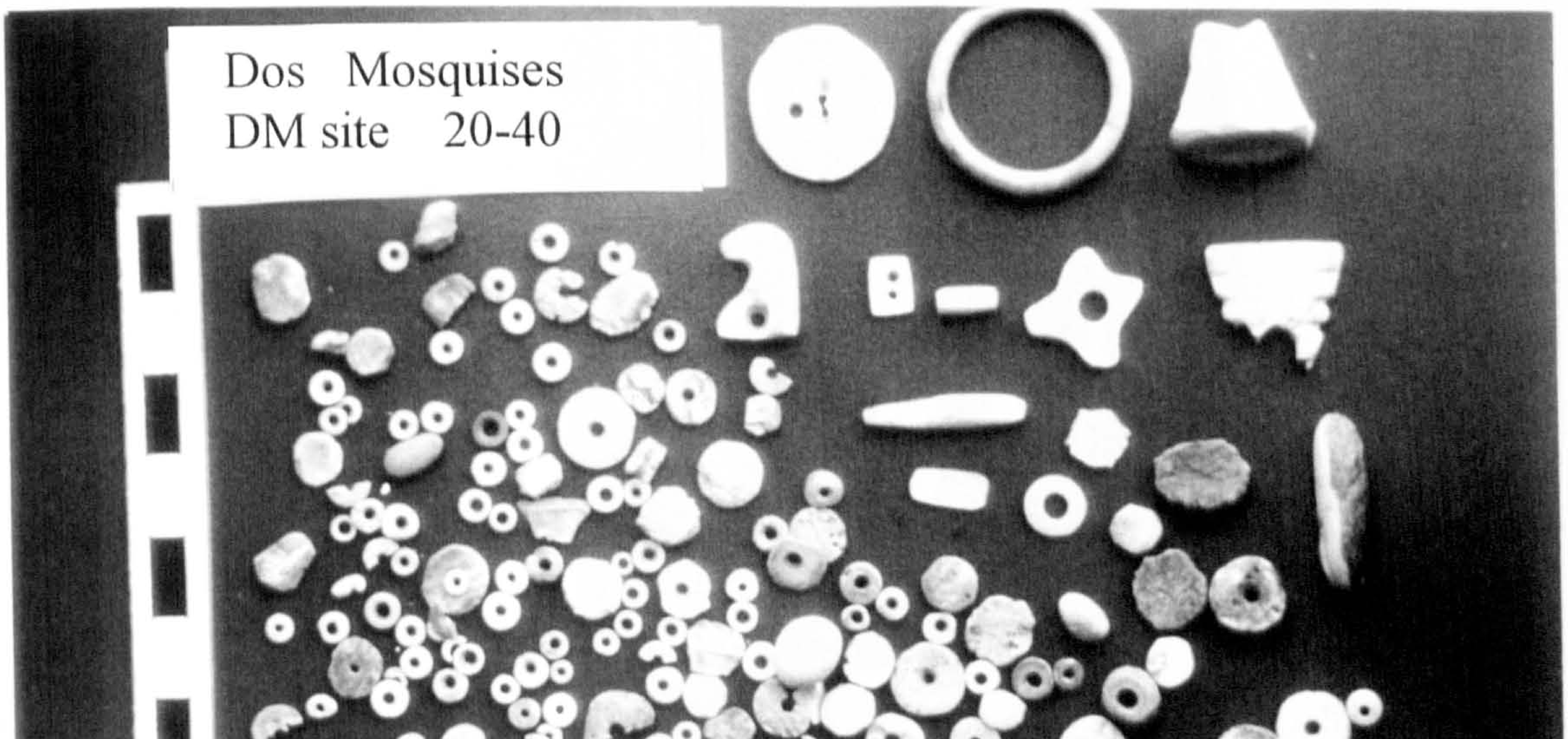


FIGURE 46. *Selection of beads, pendants and miscellaneous shell work from DM site.*

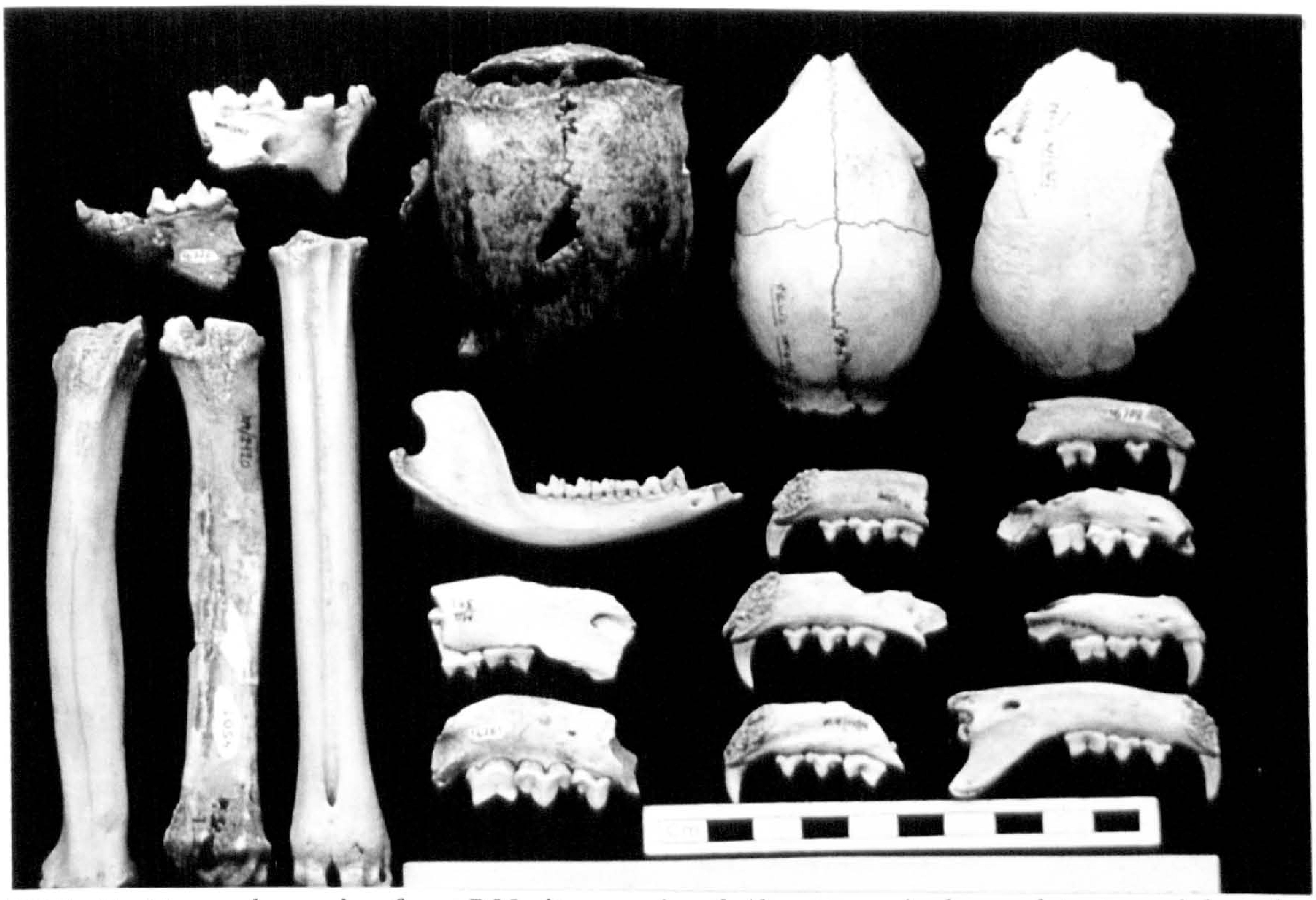


FIGURE 47. *Mammal remains from DM site: crania of Alouatta seniculus and two cranial vaults of Felidae (top row), three bones of deer(lower row left), ramus of the mandible of Didelphis marsupialis and mandibular fragments of Felis wiedii and Felis pardalis.*

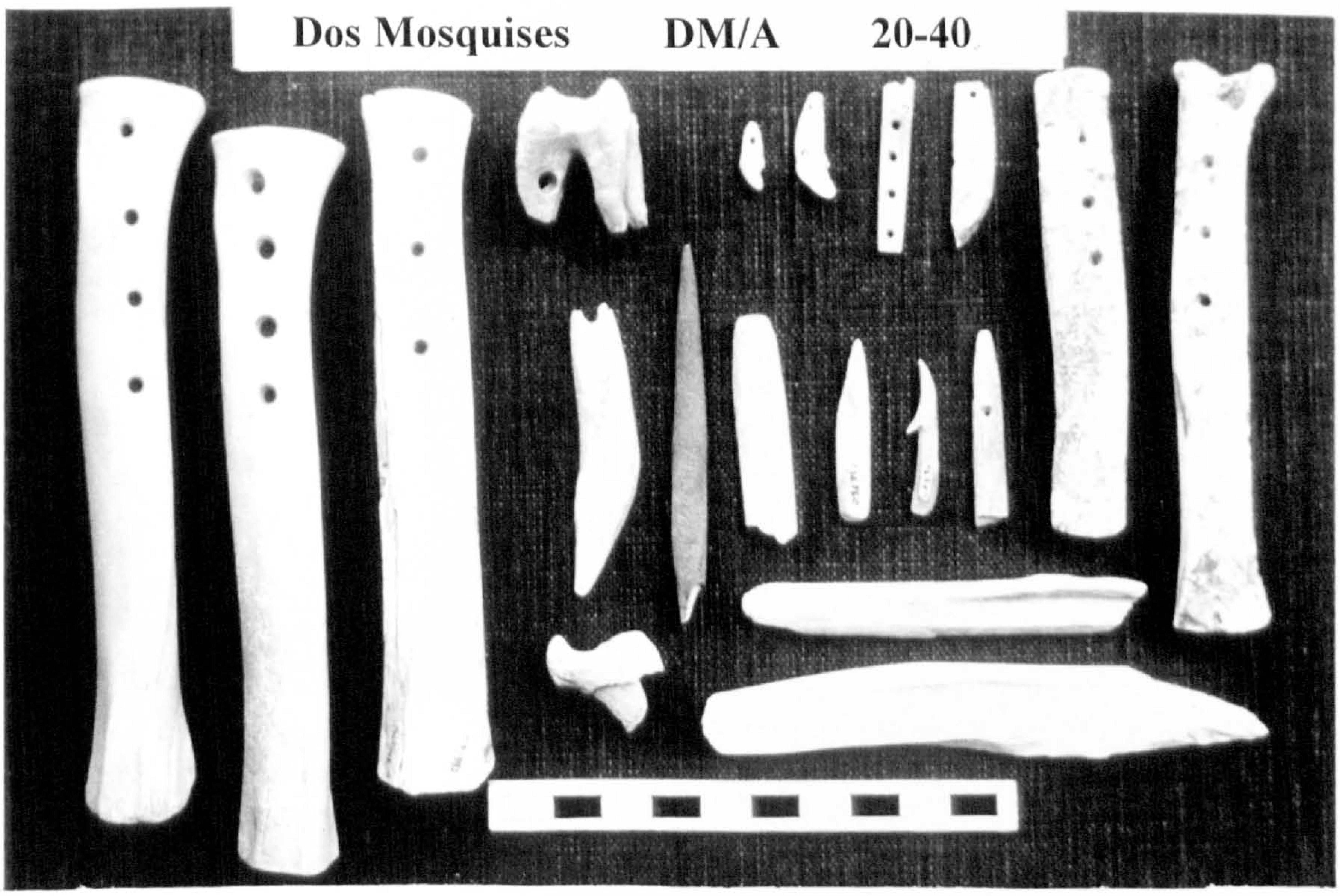


FIGURE 48. *Flutes and other mammal bone artefacts from DM site and two flutes from CS/D site (right upper corner).*

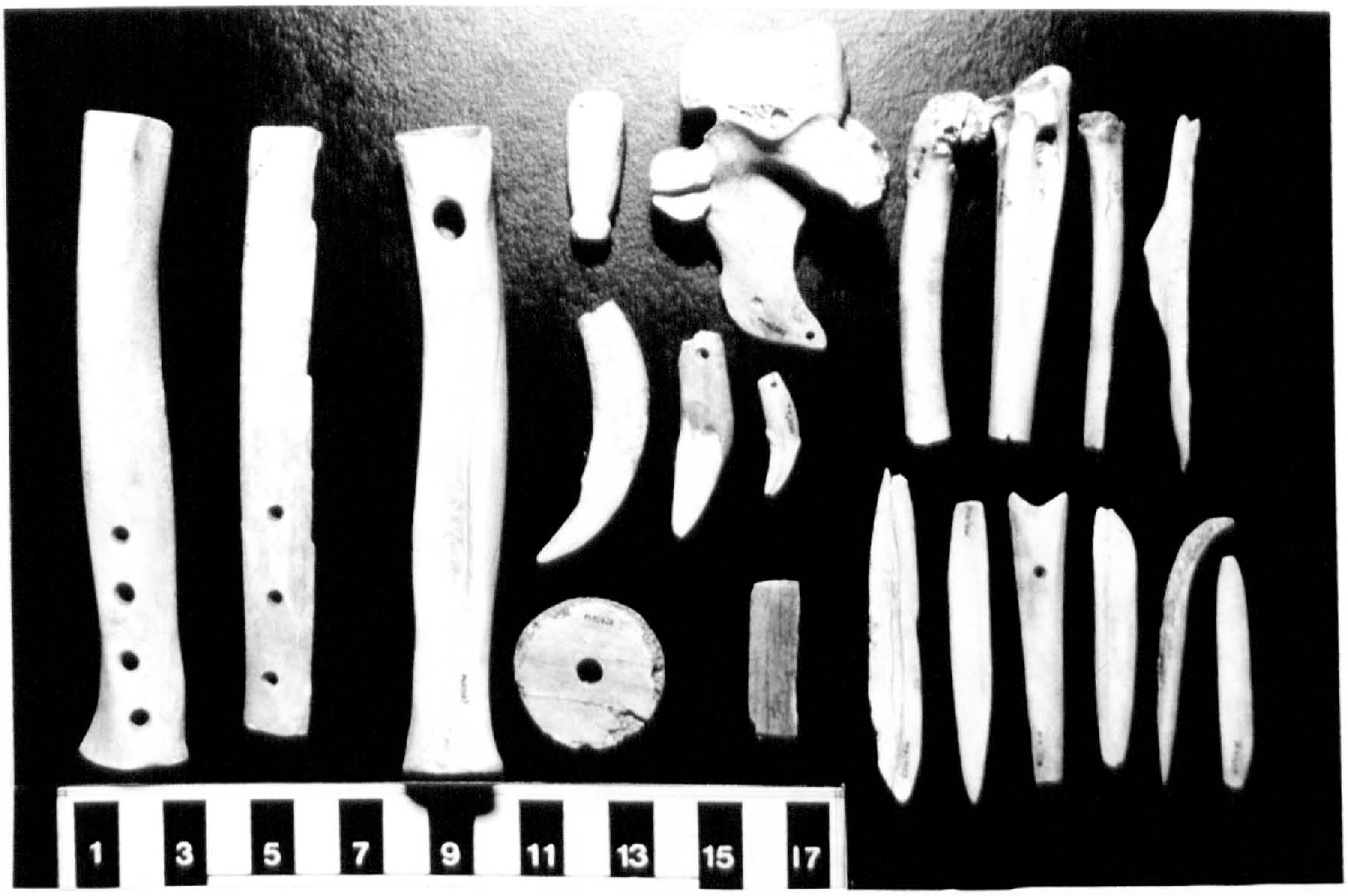


FIGURE 49. ***Mammal bone flutes, teeth pendants, worked vertebrae, projectile points and worked bird bones from DM site.***

FIGURE 50. ***Mammal bone projectile points and awl perforator from DM site.***

FIGURE 51. *Lithic artefacts from DM site (micro-axes, pendants and various).*

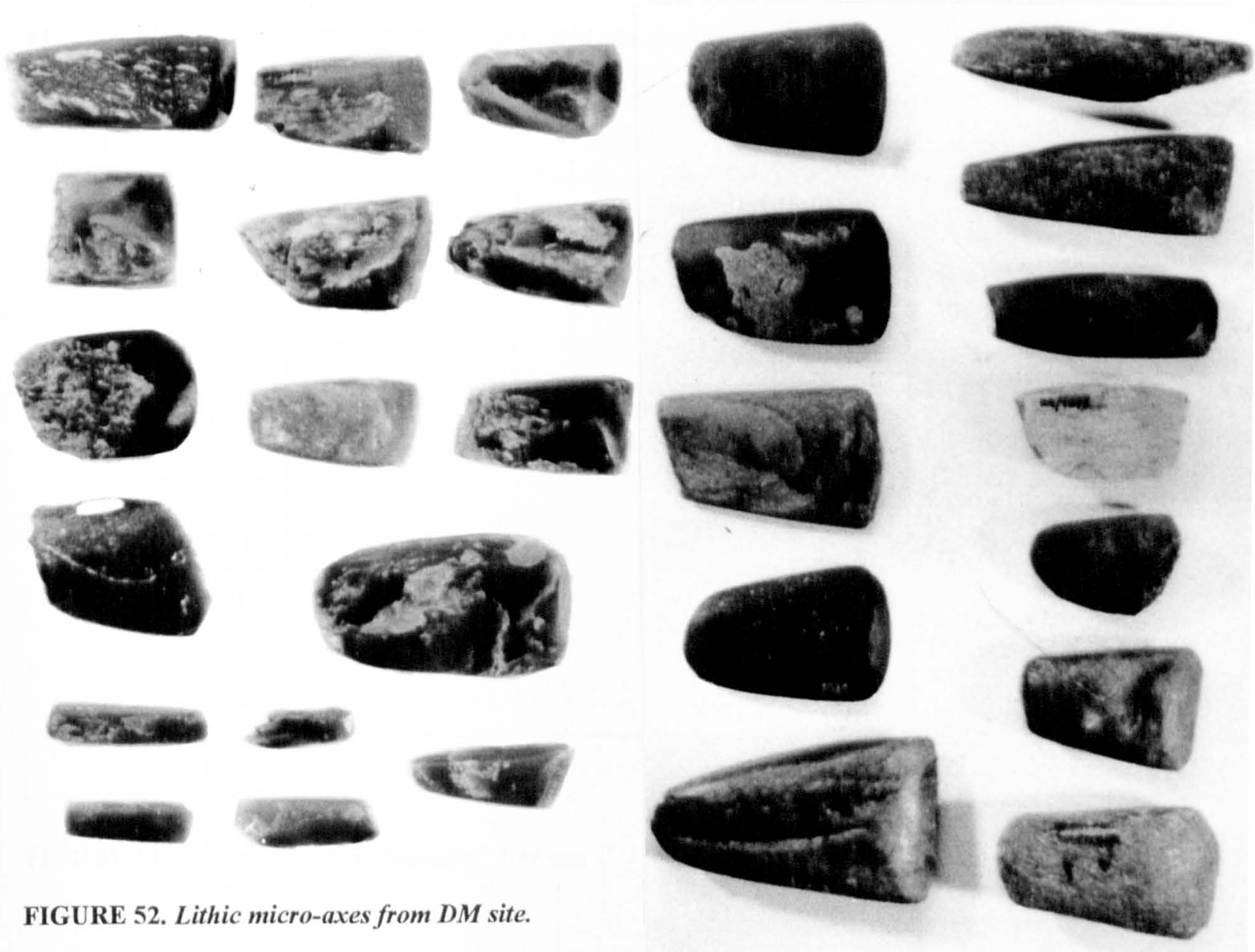


FIGURE 52. *Lithic micro-axes from DM site.*

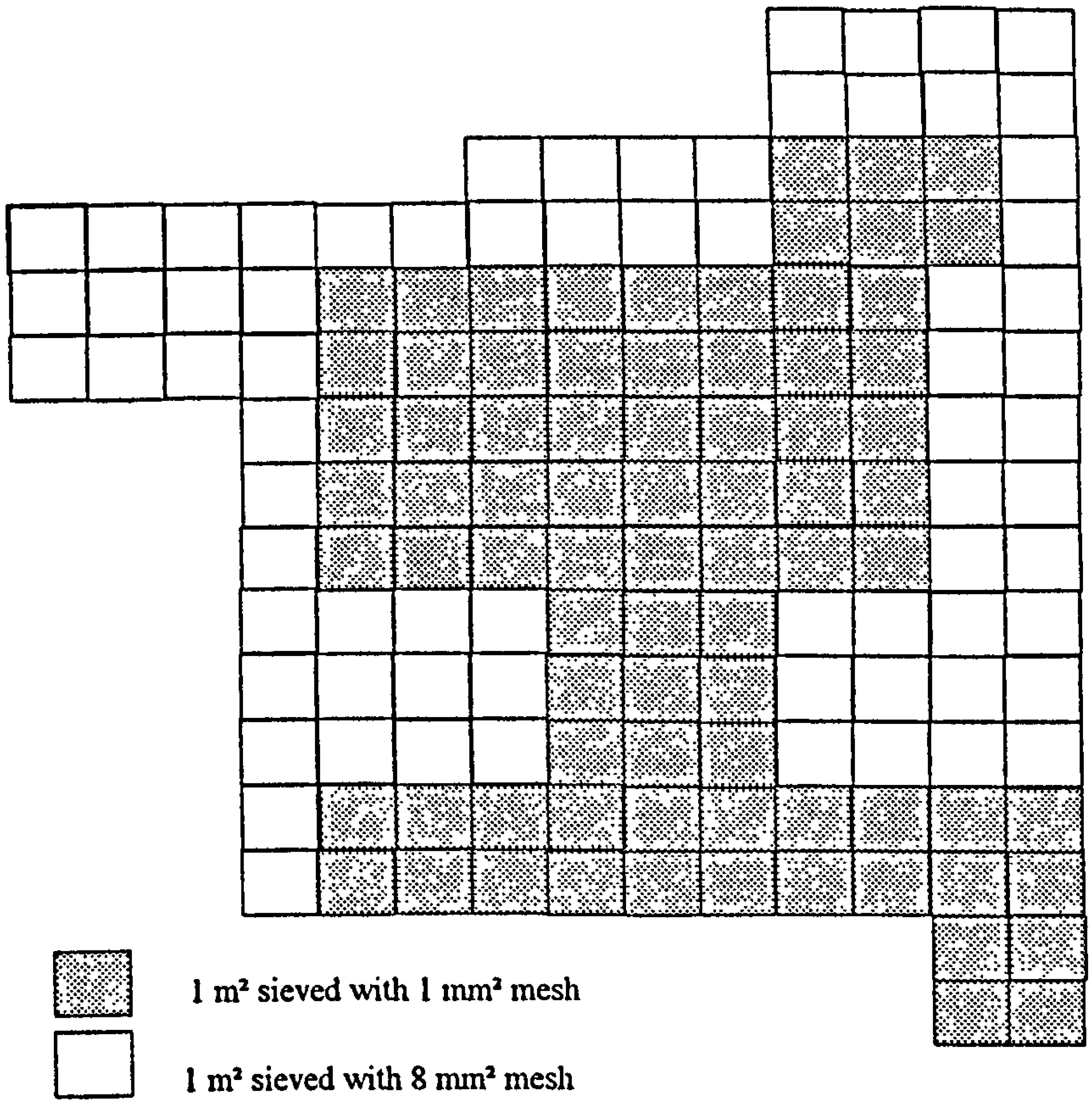


FIGURE 53. ***Differential sieving in Trench C, DM site (see also Table 10).***

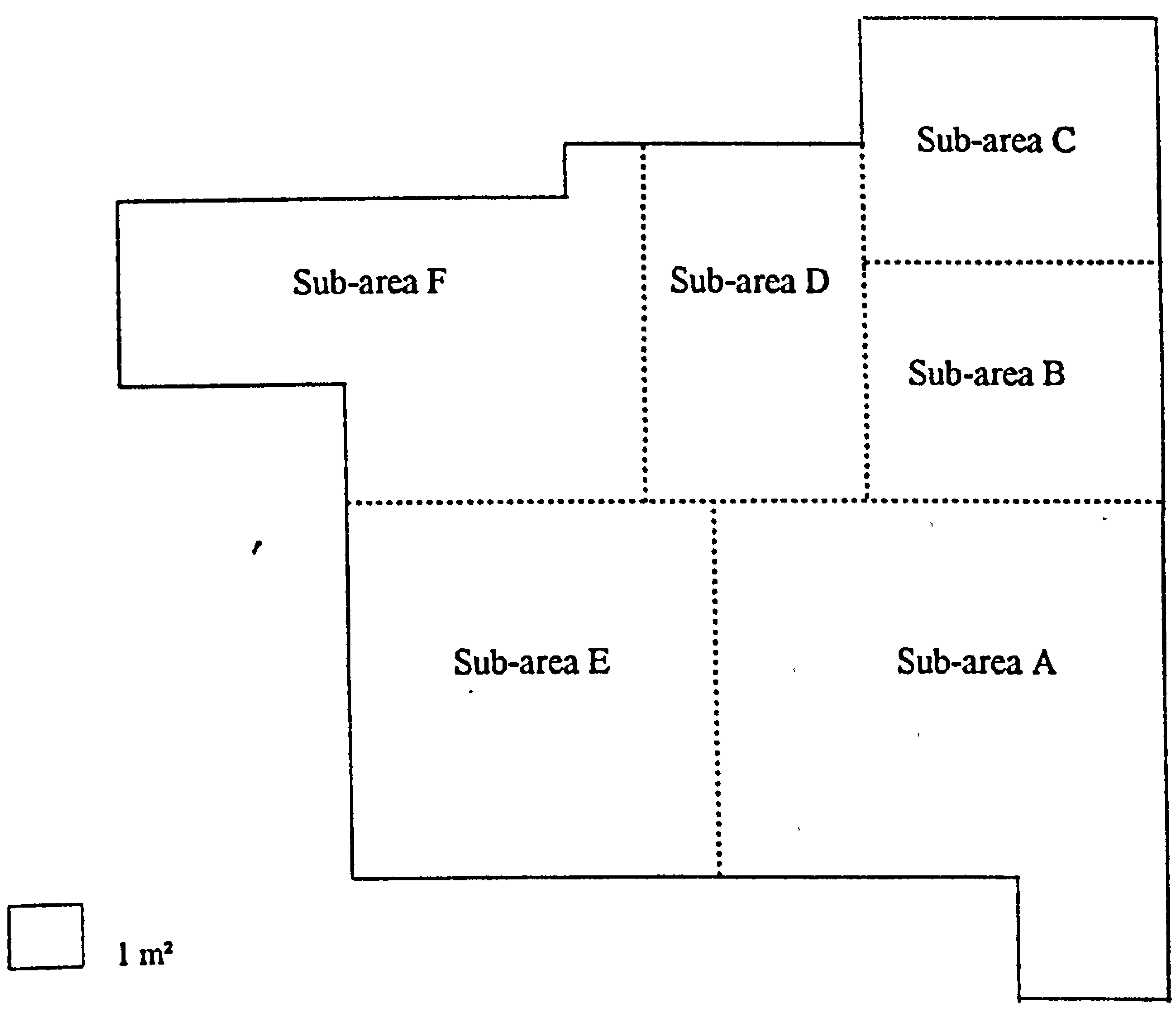


FIGURE 54. ***Sub-areas A-F in Trench C, DM site.***

FIGURE 55. ***Partial view of excavation of Trench C, DM site.***

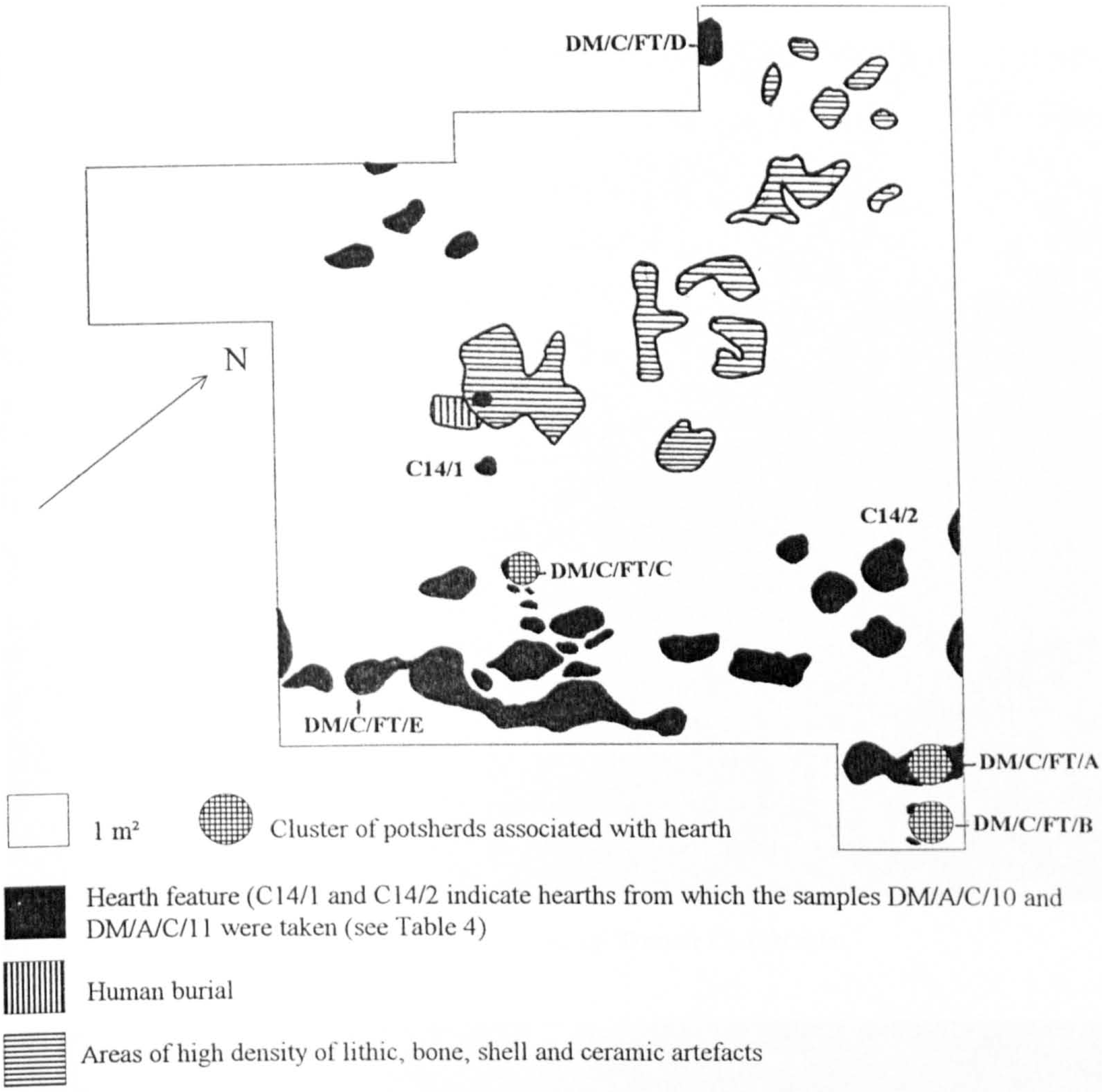


FIGURE 56. ***Hearths and areas of high artefactual density in Trench C, DM site.***

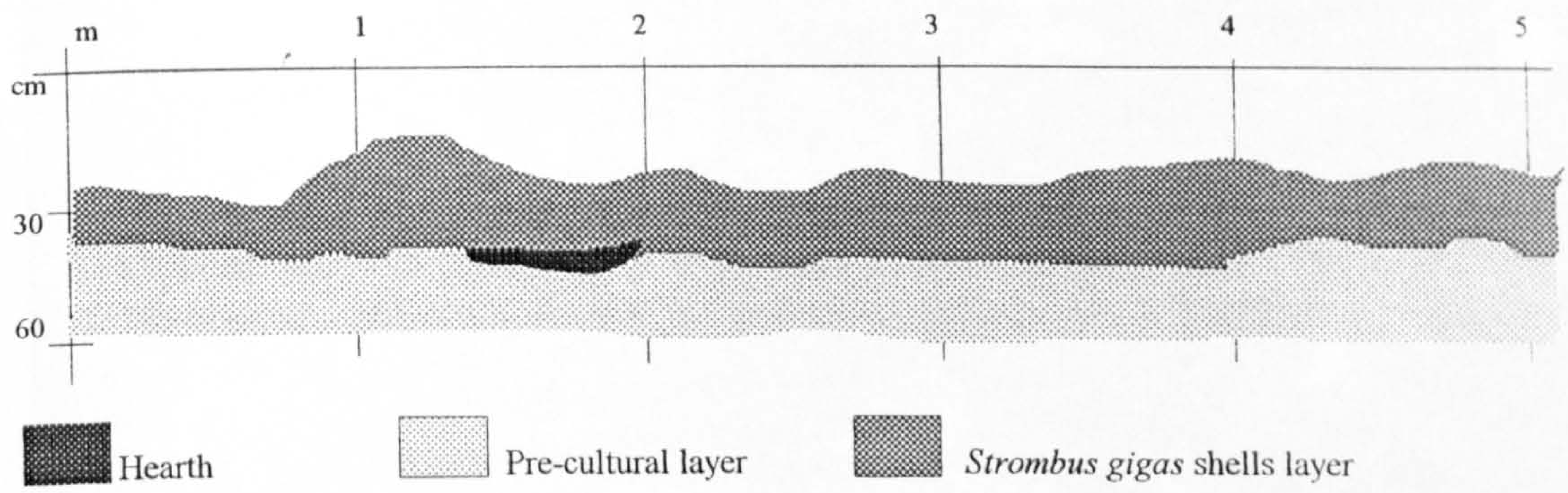


FIGURE 57. ***Selected profile section from Trench C, DM site.***

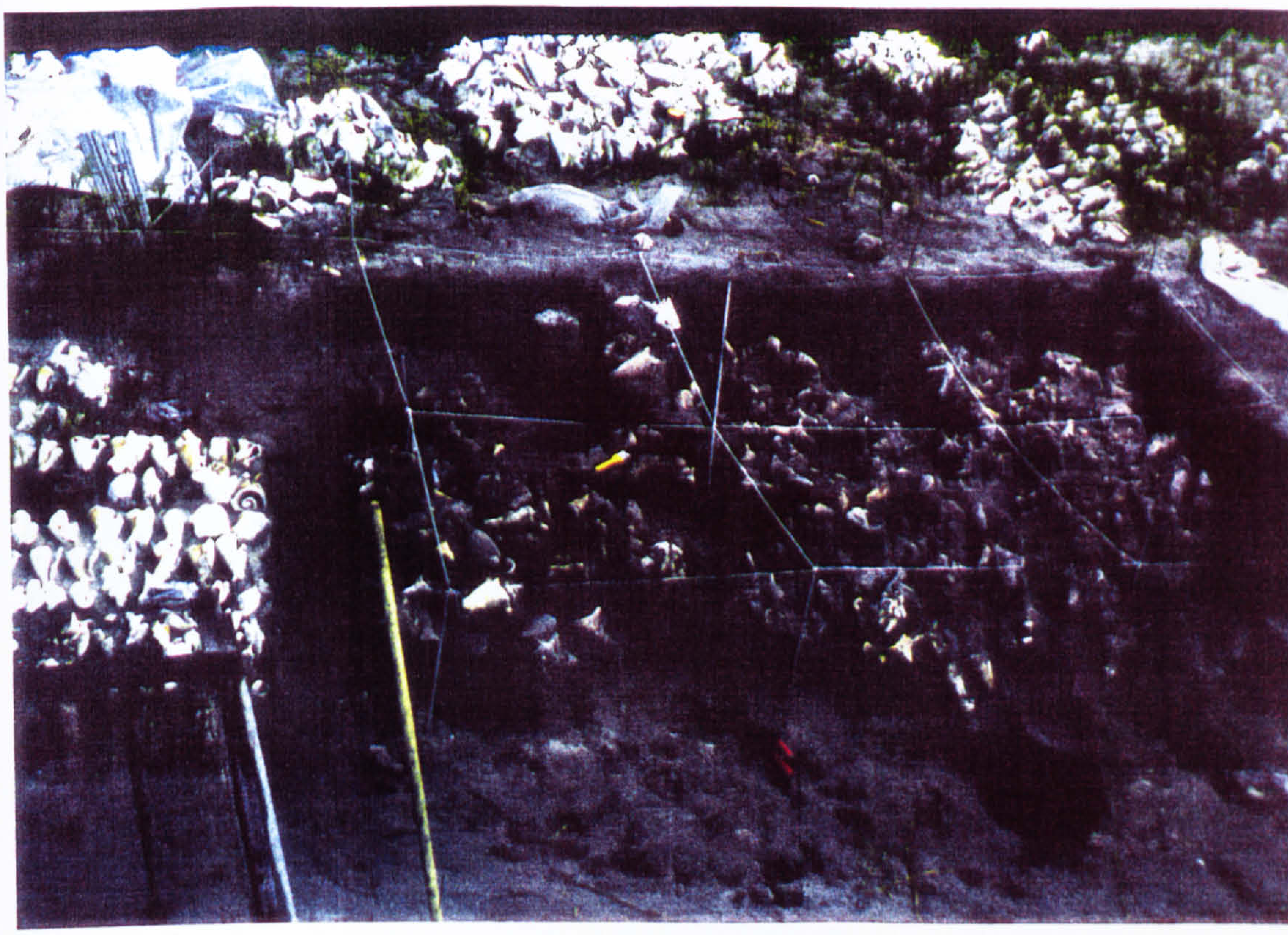


FIGURE 58. *View of the south-western corner of Trench C, DM site.*

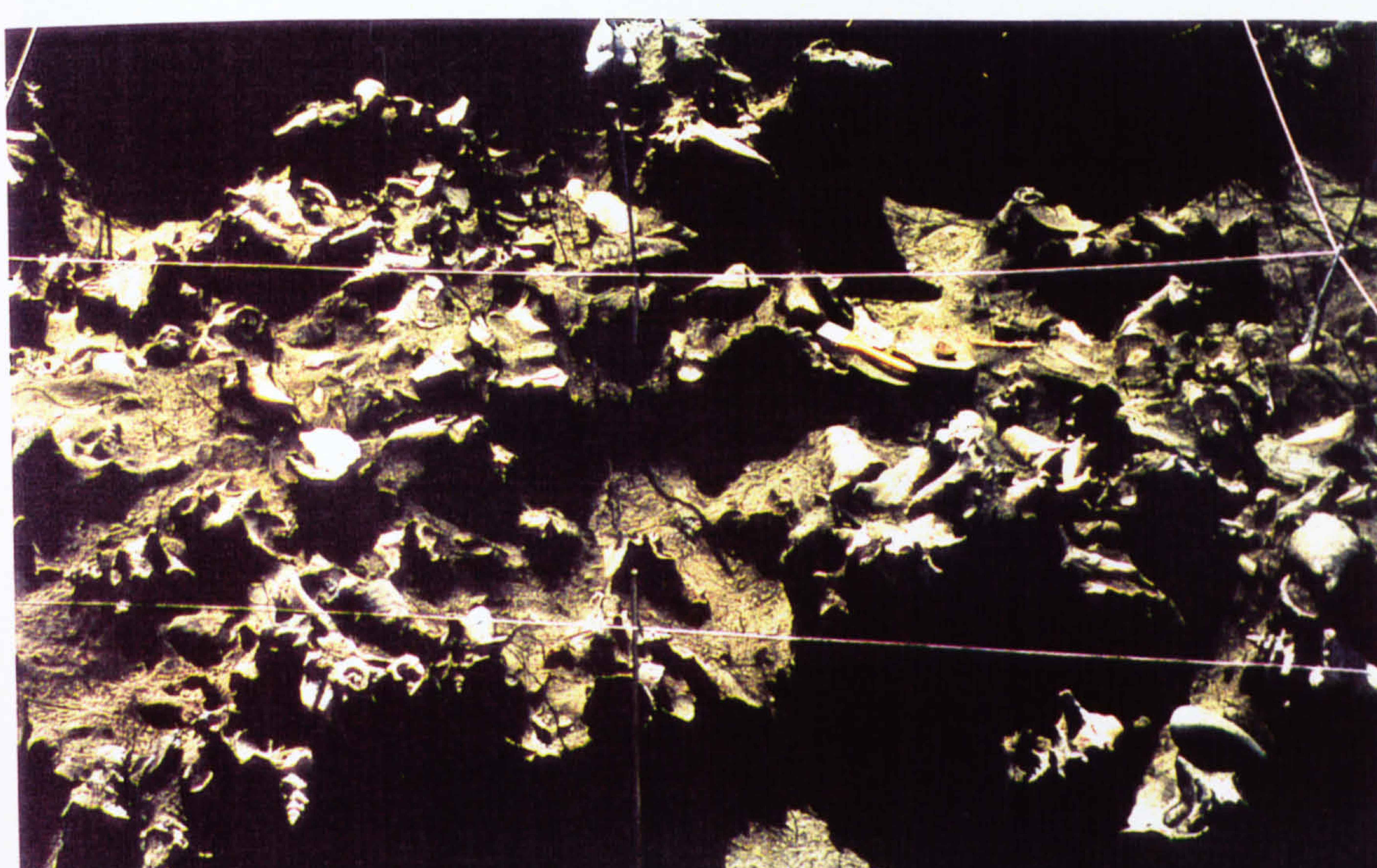


FIGURE 59. *Close up of the shell deposit in south-western corner of Trench C, DM site.*

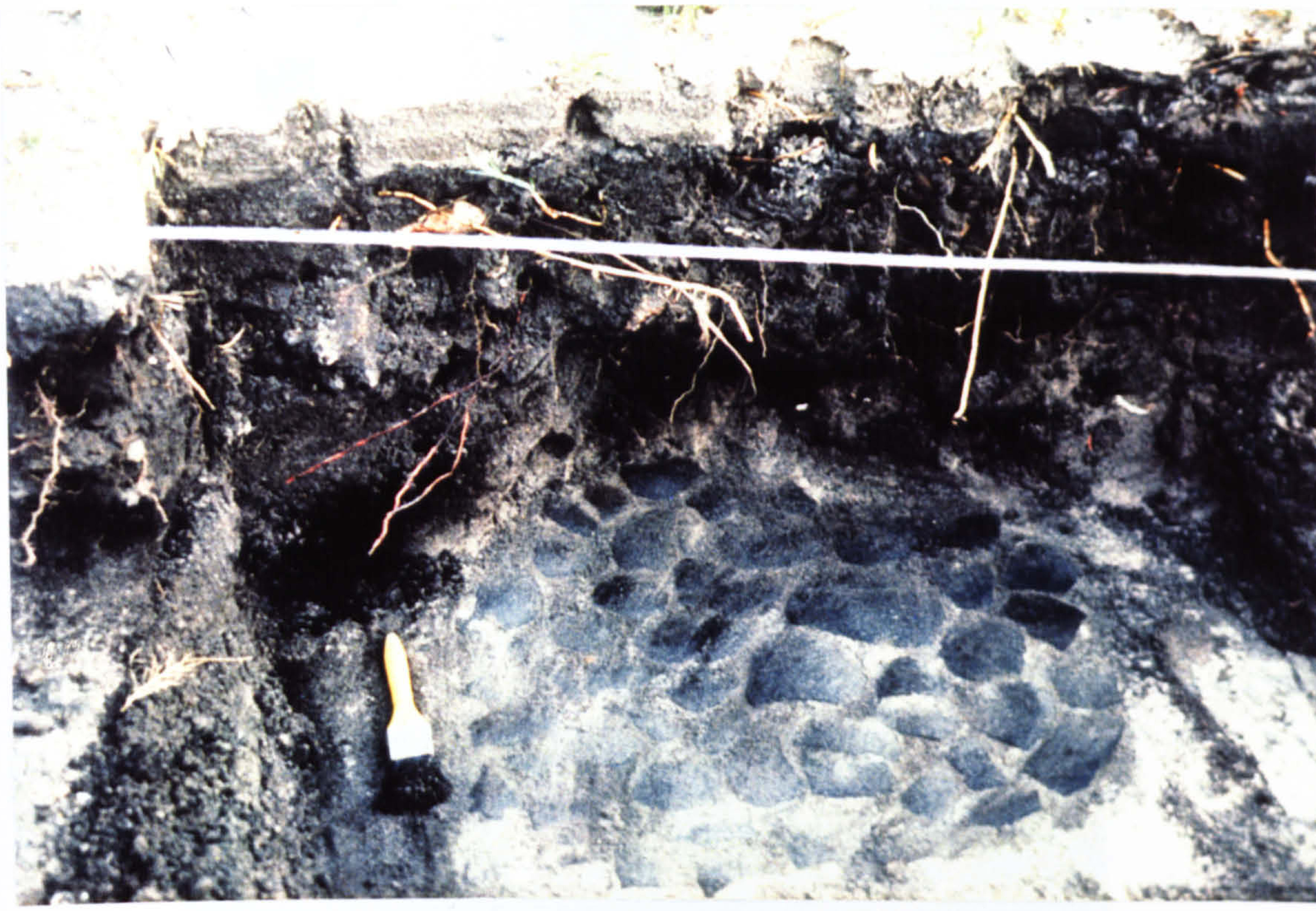


FIGURE 60. ***Hearth base made out of potsherds in Trench C, DM site (feature DM/C/FT/C; see Table 16).***

FIGURE 61. ***Micro-context from Trench C, DM site, showing human bones lying on Strombus gigas shells and associated with quartz pebble.***

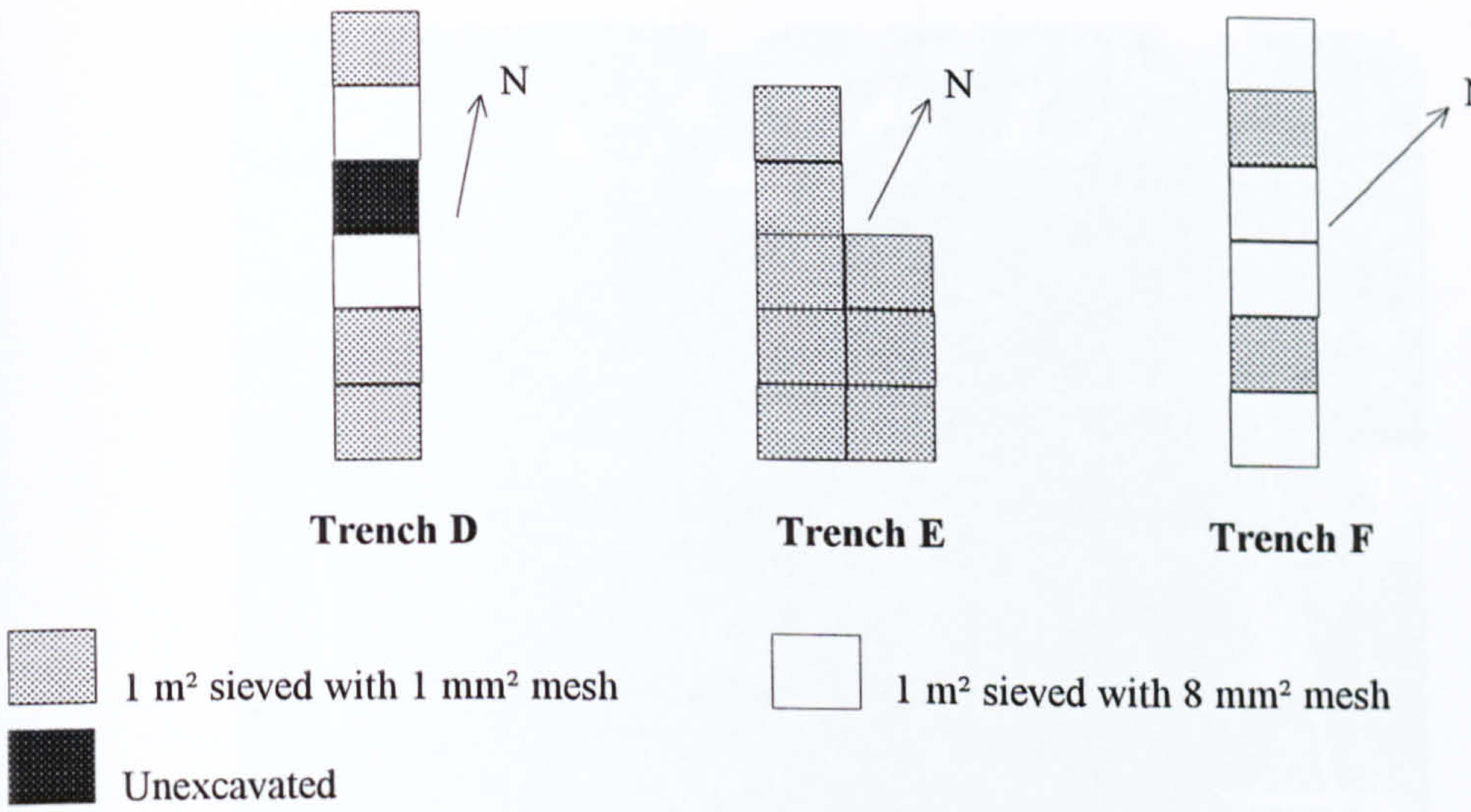


FIGURE 62. ***Differential sieving in Trenches D-F, DM site.***

FIGURE 63. ***Partial view of excavation in Trench E, DM site.***

FIGURE 64. *Partial view of excavation in Trench D, DM site.*

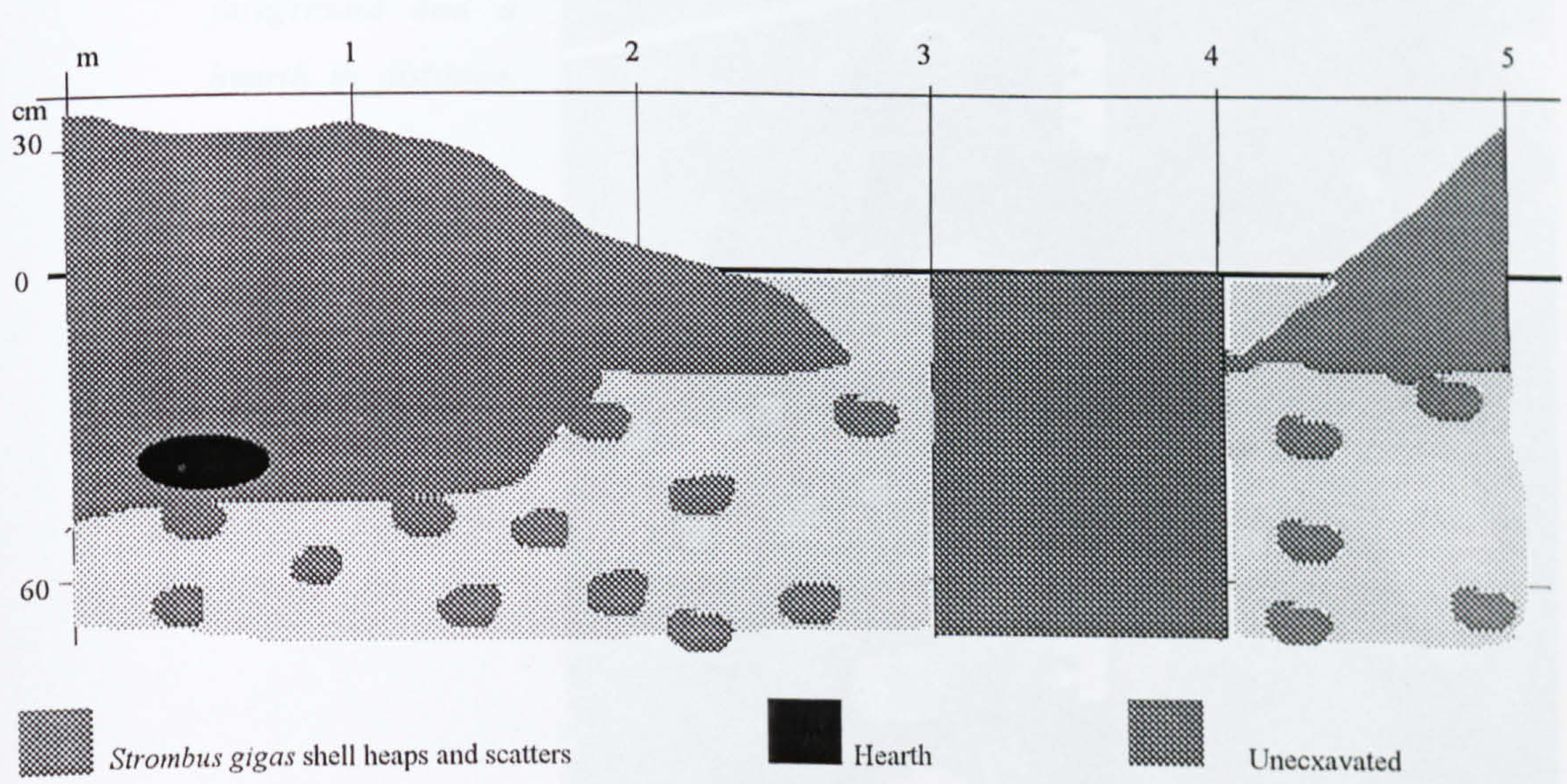


FIGURE 65. *Selected fragment of profile in Trench D, DM site.*

FIGURE 66. ***Excavations at Domusky Norte site (DMN).***

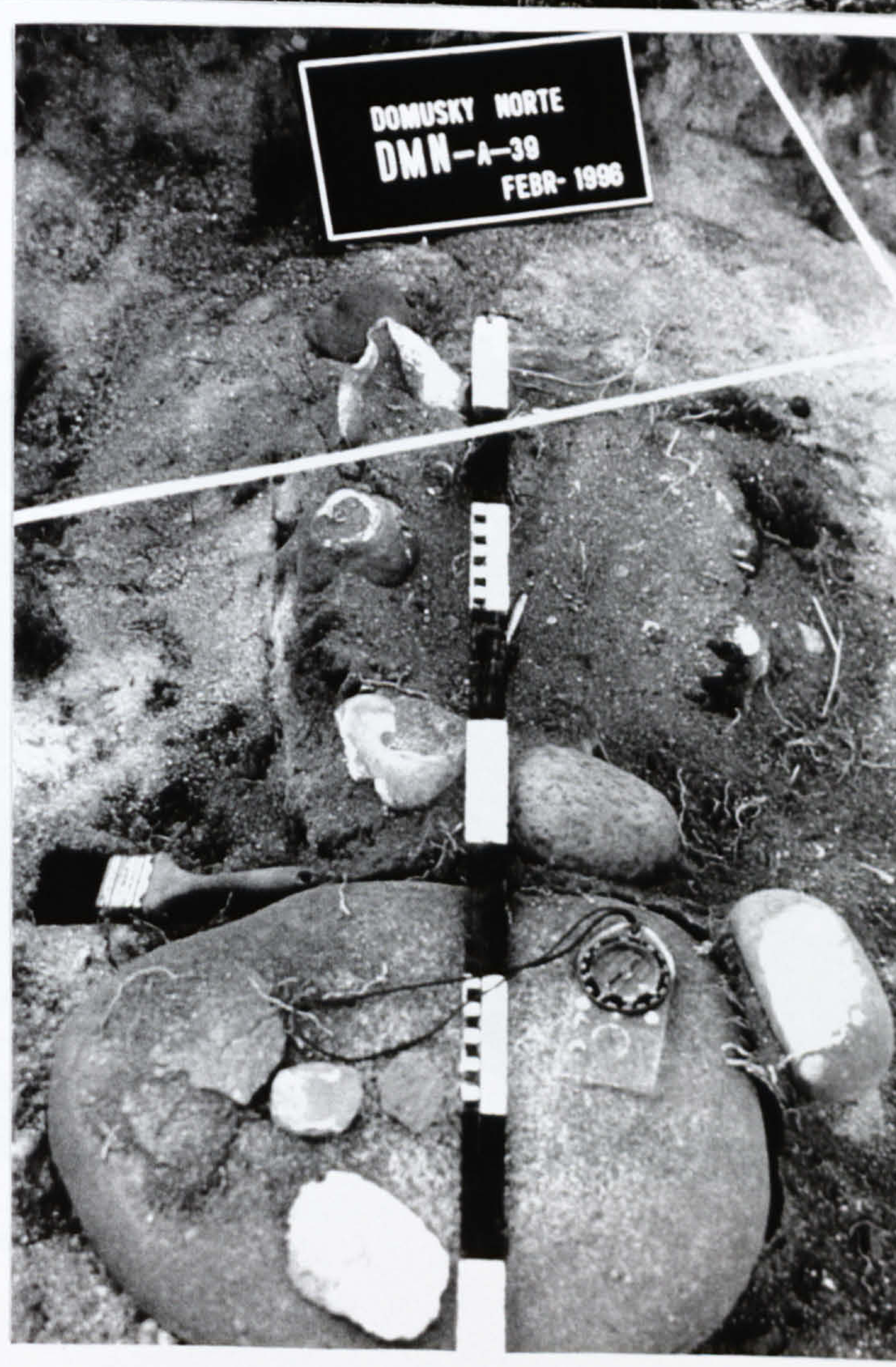


FIGURE 67. ***Micro-context with lithic <u>metate</u> and two <u>manos</u> in foreground and a hearth in distance, DMN site.***

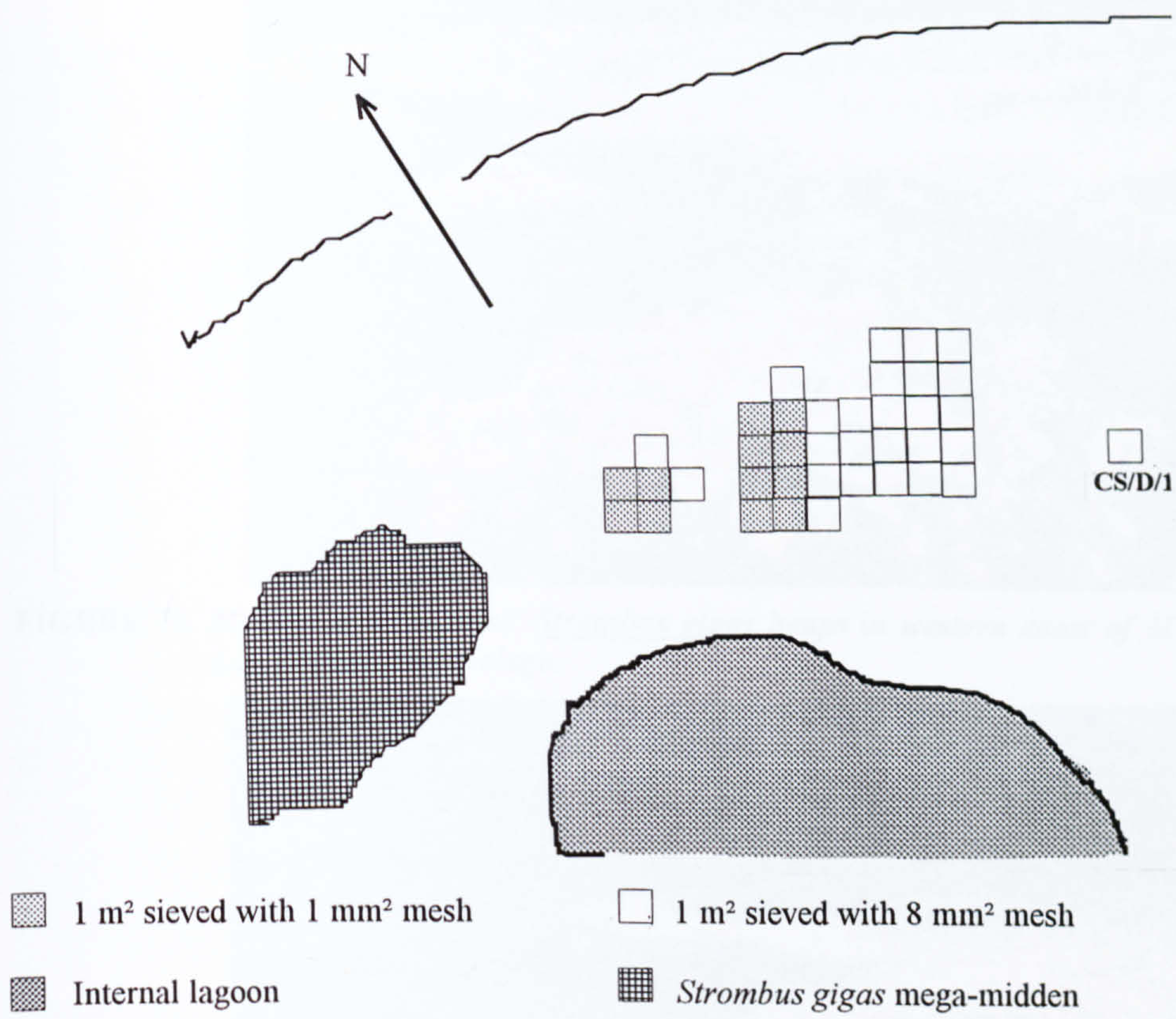


FIGURE 68. ***Plan of excavations at CS/D site, Cayo Sal Island, Los Roques Archipelago.***

FIGURE 69. ***Excavations at CS/D site.***

FIGURE 70. ***Modern and 'ancient' Strombus gigas heaps in western coast of Mosquitoquí Island, Los Roques Archipelago.***

FIGURE 71. ***Prehistoric Strombus gigas heaps on the shore of the inner lagoon at CS/C site, Cayo Sal Island.***

FIGURE 72. ***Shallow scatters of 'ancient'*** **Strombus gigas** ***shells on the western coast of Isla de Loco, Los Roques Archipelago.***

FIGURE 73. *View of south-western part of Trench C, DM site, showing piles of classified* Strombus gigas *artefacts.*

FIGURE 74. *View of the southern part of Trench C, DM site, during the classification of* Strombus gigas *shells.*

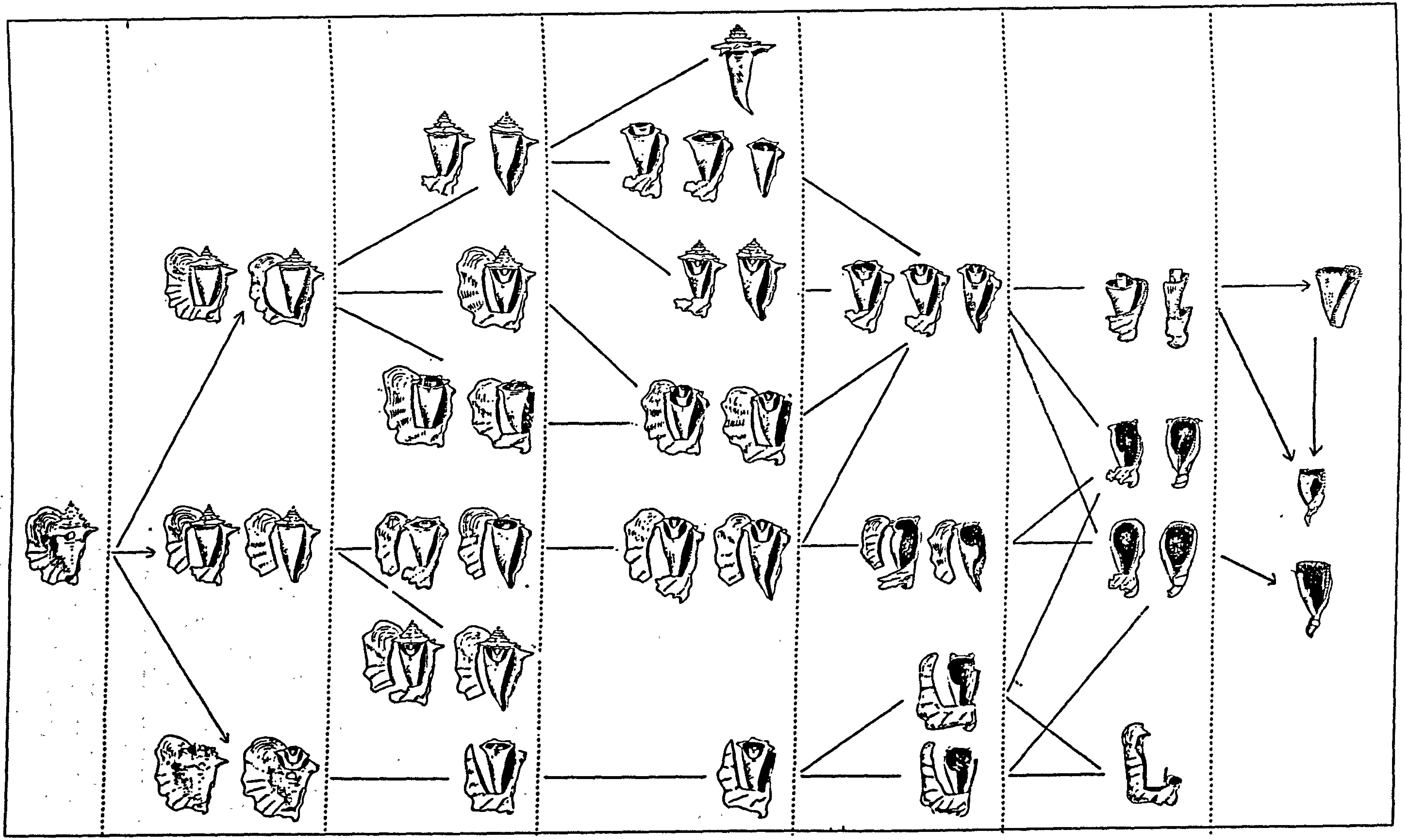


FIGURE 75. *'I wish it were always as simple as this' diagram (for details see Chapter 8).*

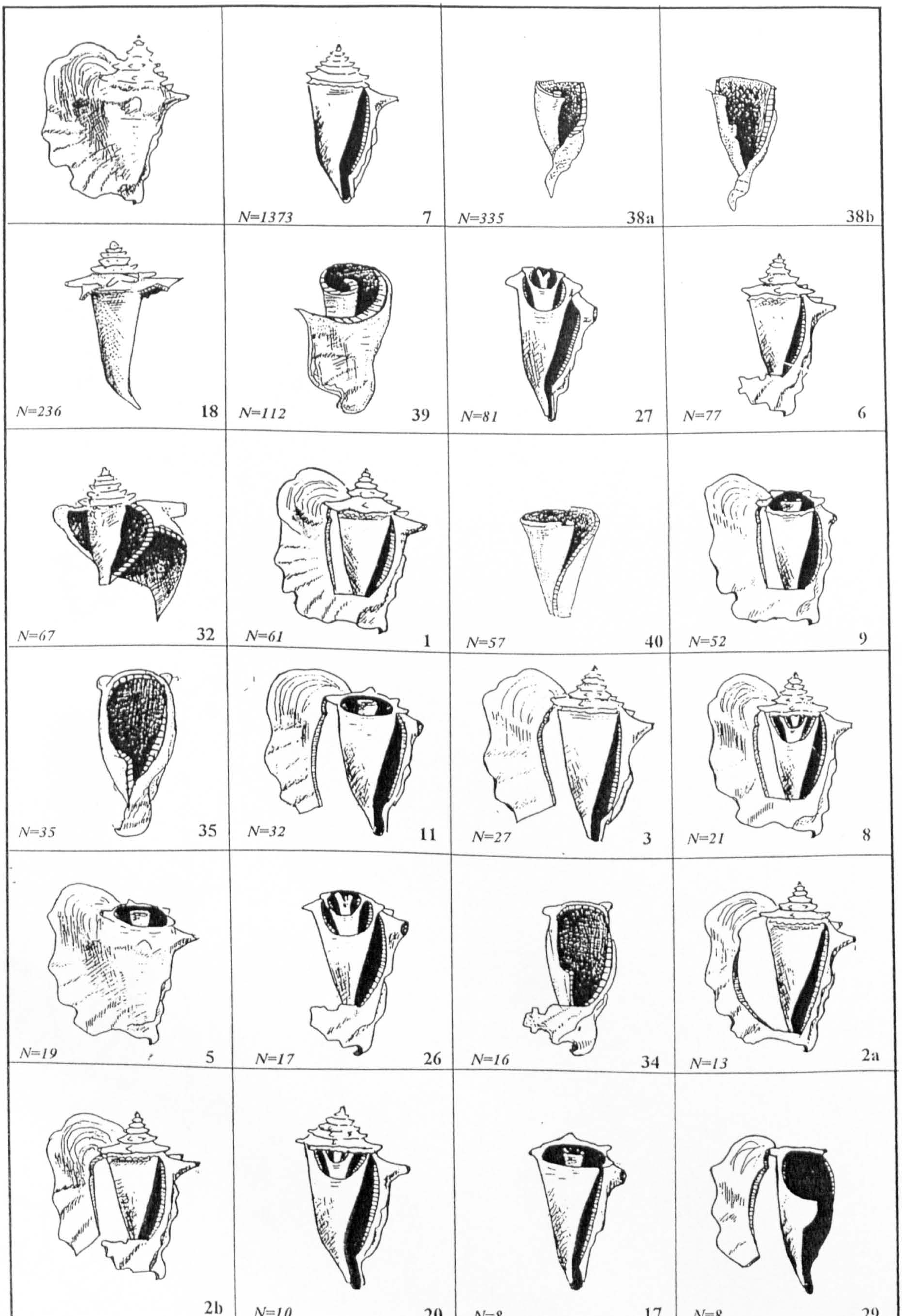


FIGURE 76. *Main types and quantities of artificially modified Strombus gigas shells recovered from Trench C, DM site. Quantities given in the left and types in the right corners of each square (see Table 14). For sub-types, i.e. 2 and 2a, only a total quantity is given.*

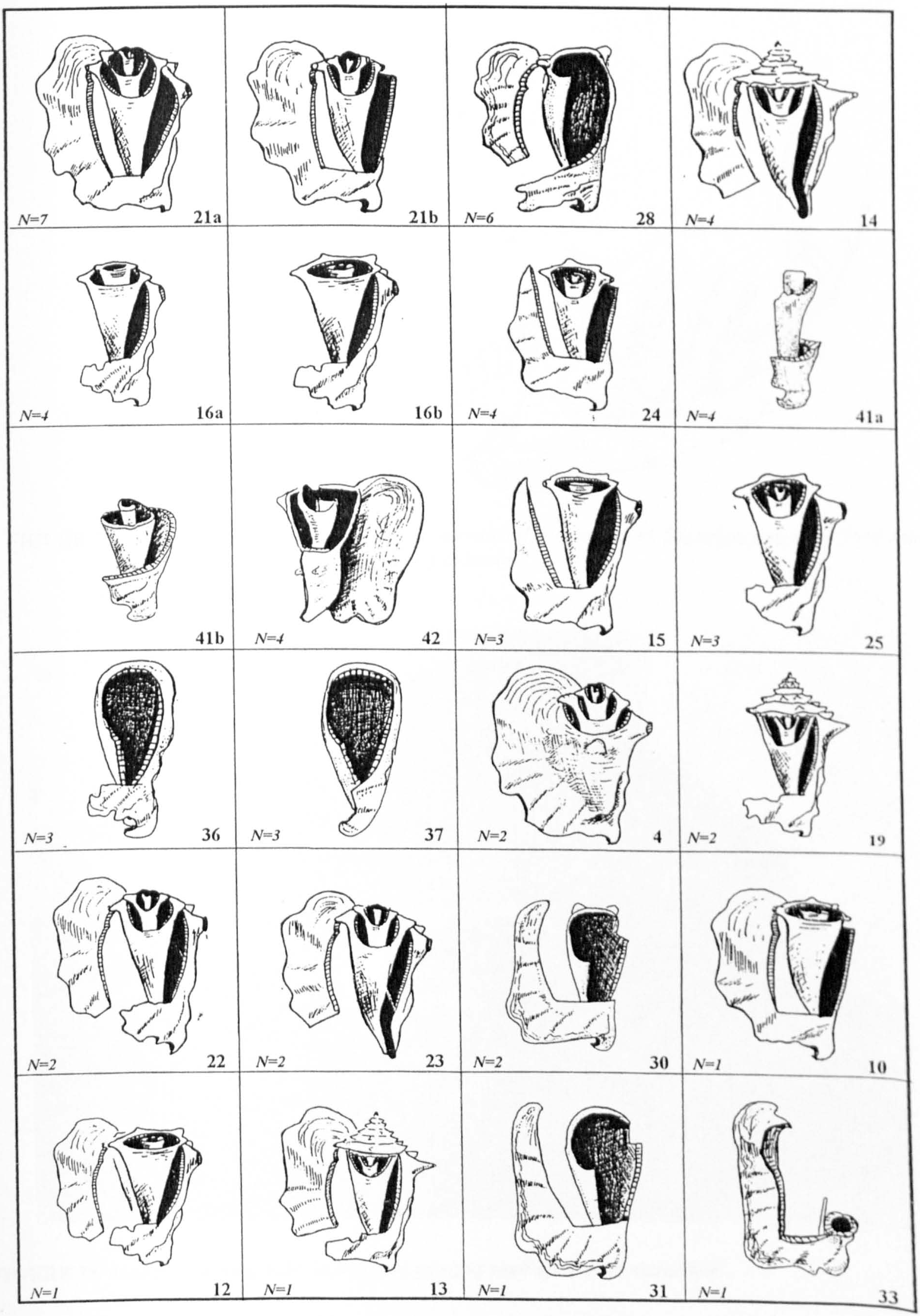


FIGURE 77. *Main types and quantities of artificially modified Strombus gigas shells recovered from Trench C, DM site (continuation of Figure 76).*

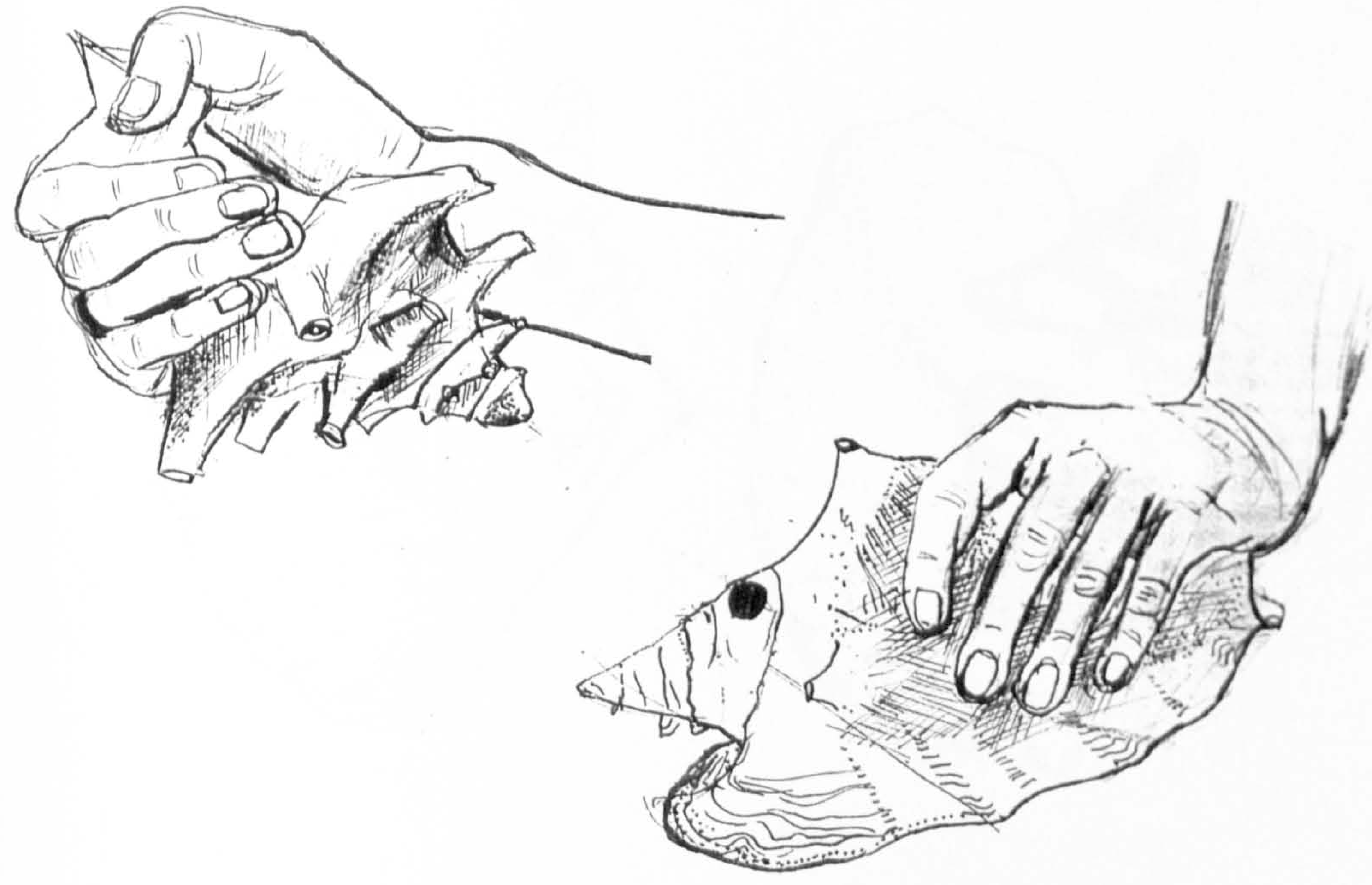


FIGURE 78. *Hypothetical reconstruction of the process of processing of Strombus gigas for food using other shell of the same species as a percussor.*

FIGURE 79. *Modern 'opening hole' in a Strombus gigas shell after meat extraction.*

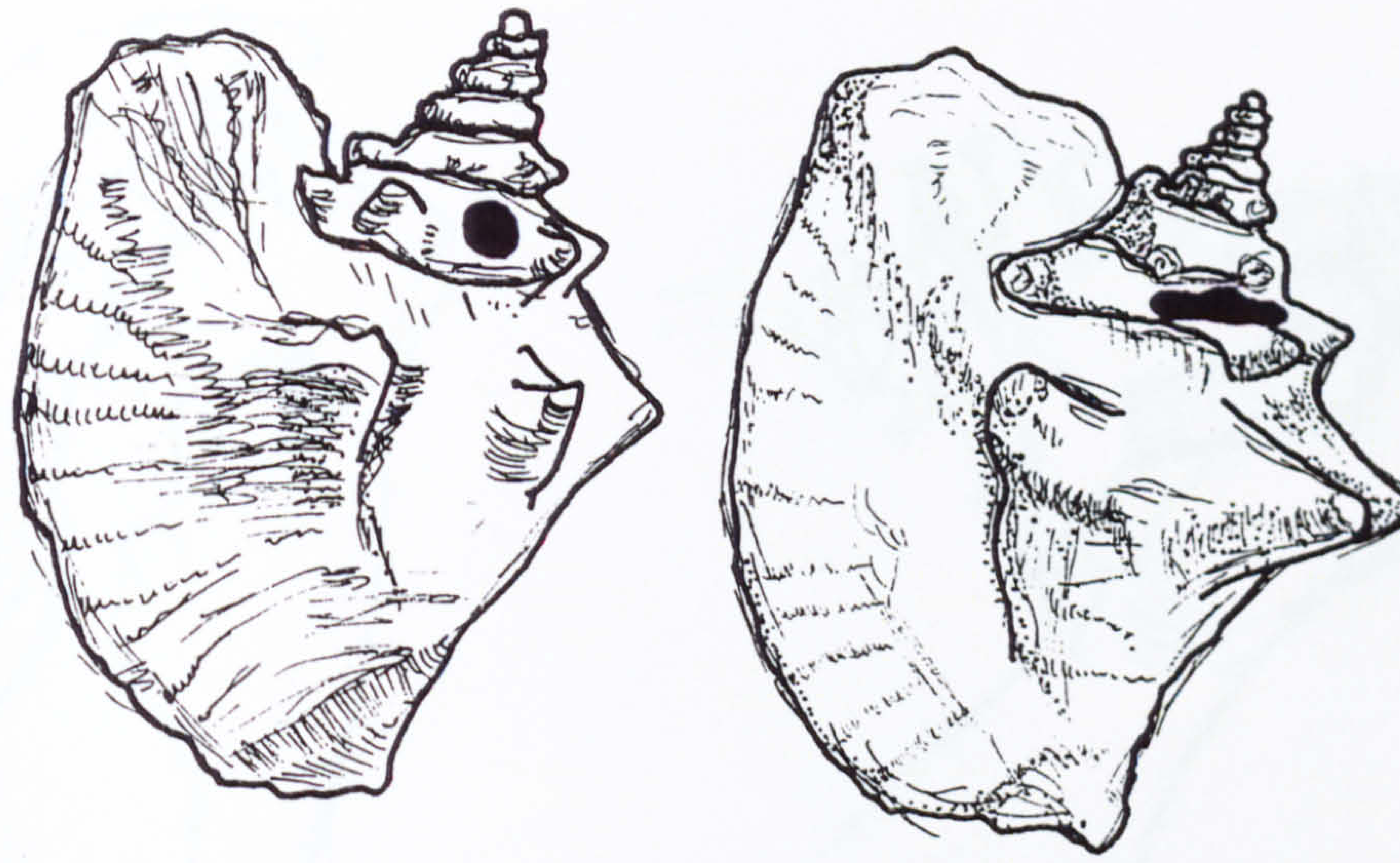


FIGURE 80. ***'Ancient' circular and modern opening holes in Strombus gigas shells.***

FIGURE 81. ***Six Strombus gigas animals give 1 kg of meat (see Chapter 8).***

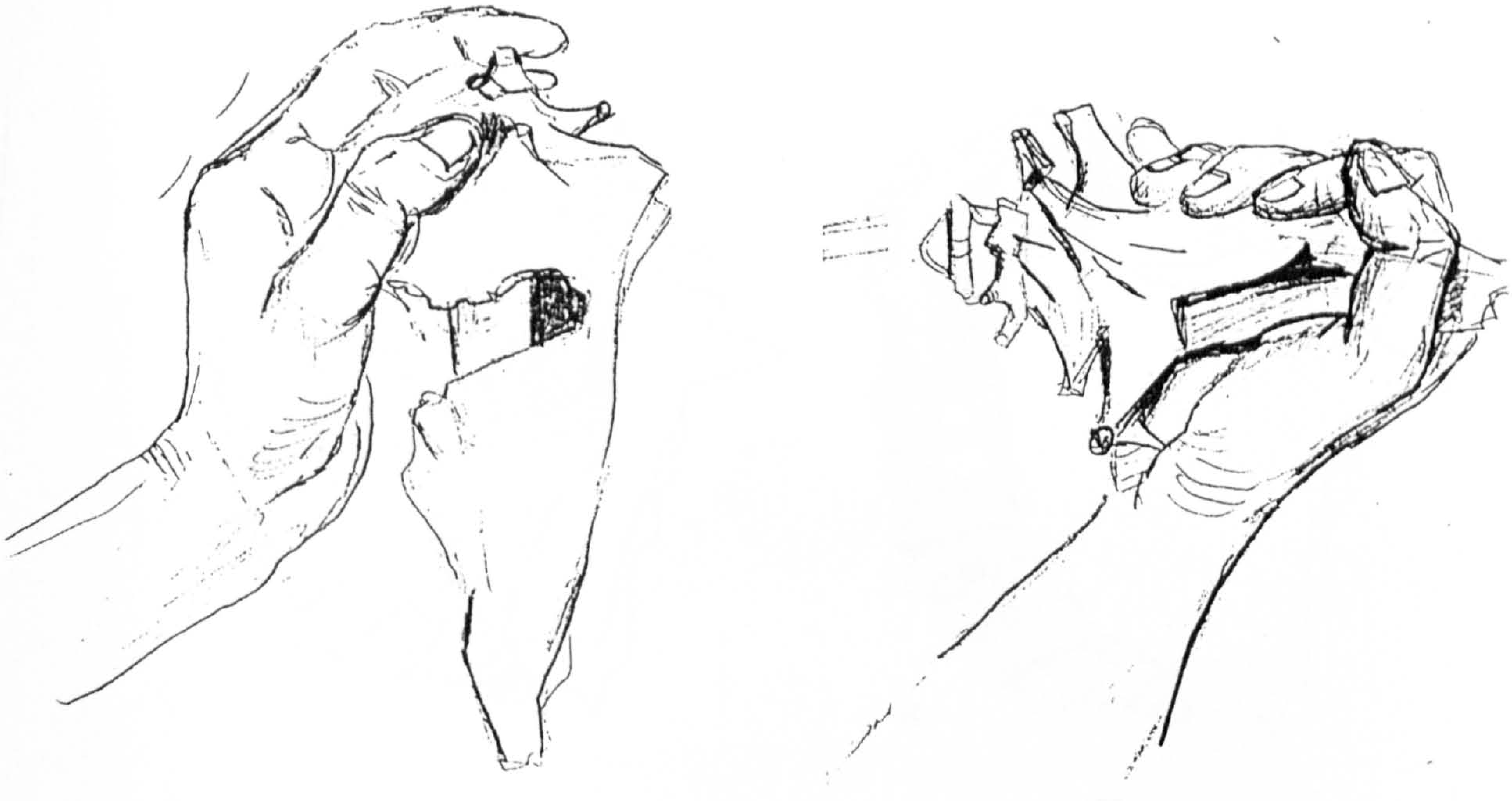


FIGURE 82. ***Hypothetical reconstruction of use of*** ***Strombus gigas*** ***shell as percussor for modification of other shells of the same species.***

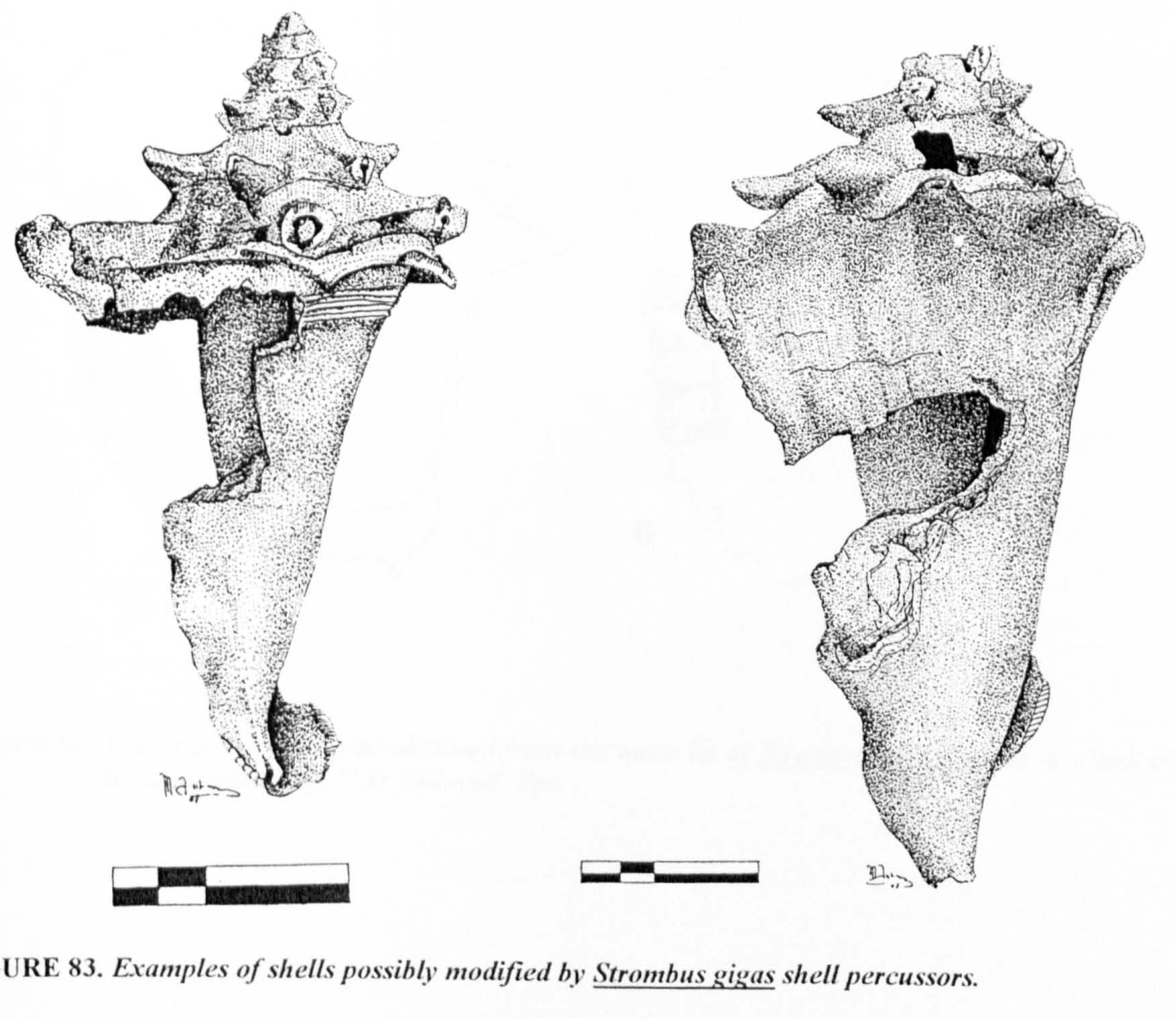


FIGURE 83. ***Examples of shells possibly modified by*** ***Strombus gigas*** ***shell percussors.***

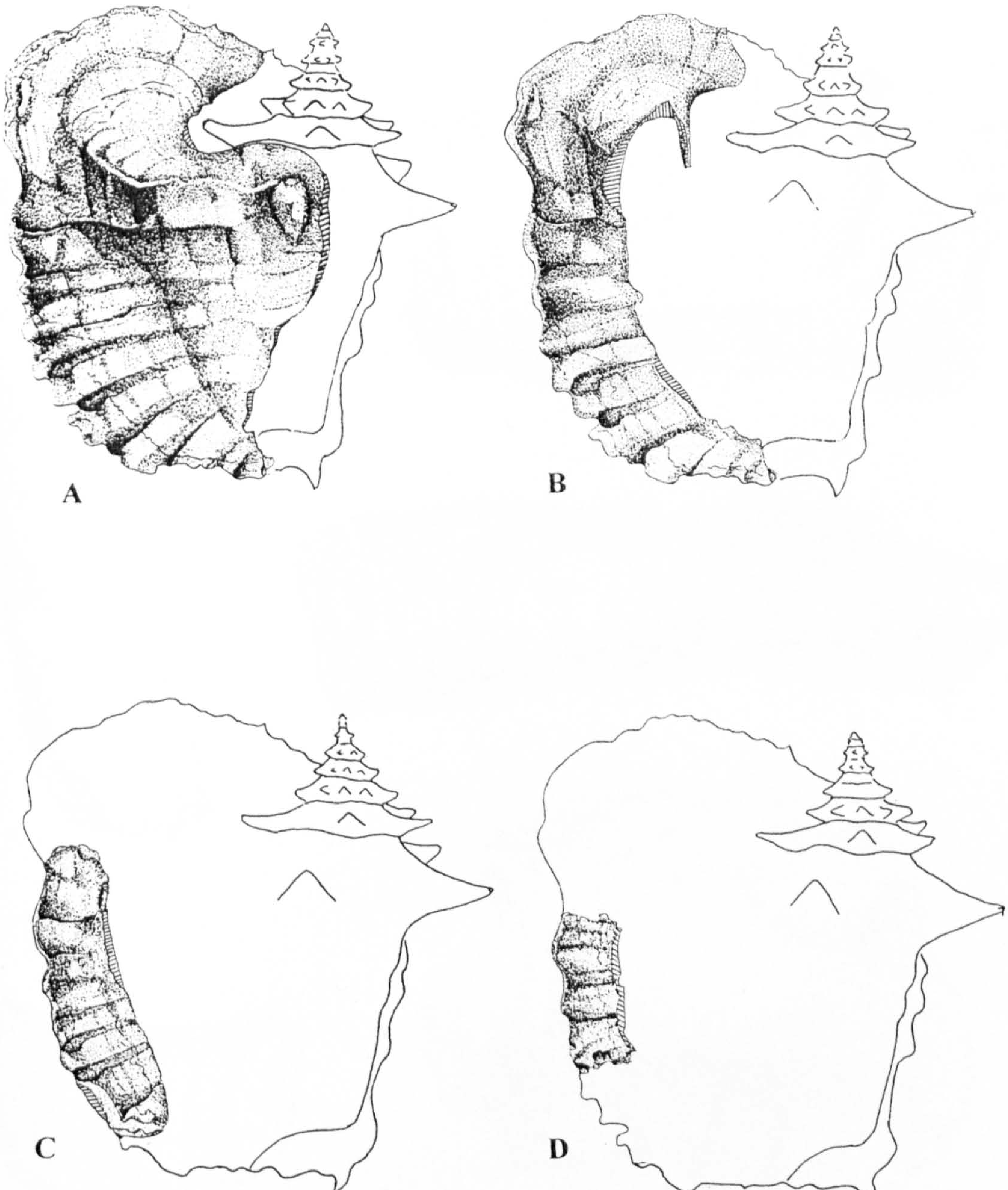


FIGURE 84. *Four types of preforms obtained from the outer lip of Strombus gigas shells: A - 'entire' lip, B-'semi-entire' lip, C-D 'reduced' lips.*

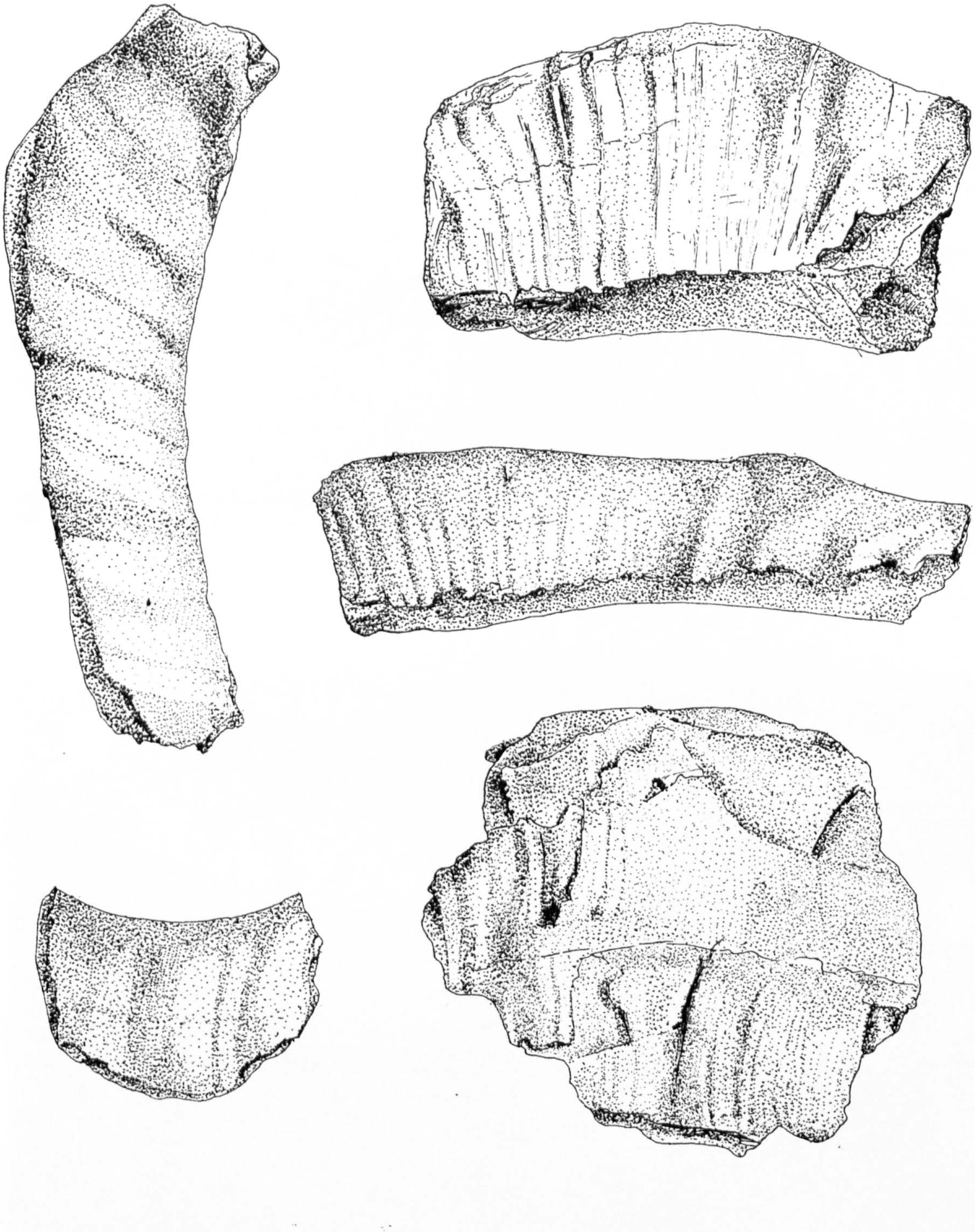


FIGURE 85. *The most common preforms made out of* *__Strombus gigas__* *shell at DM site.*

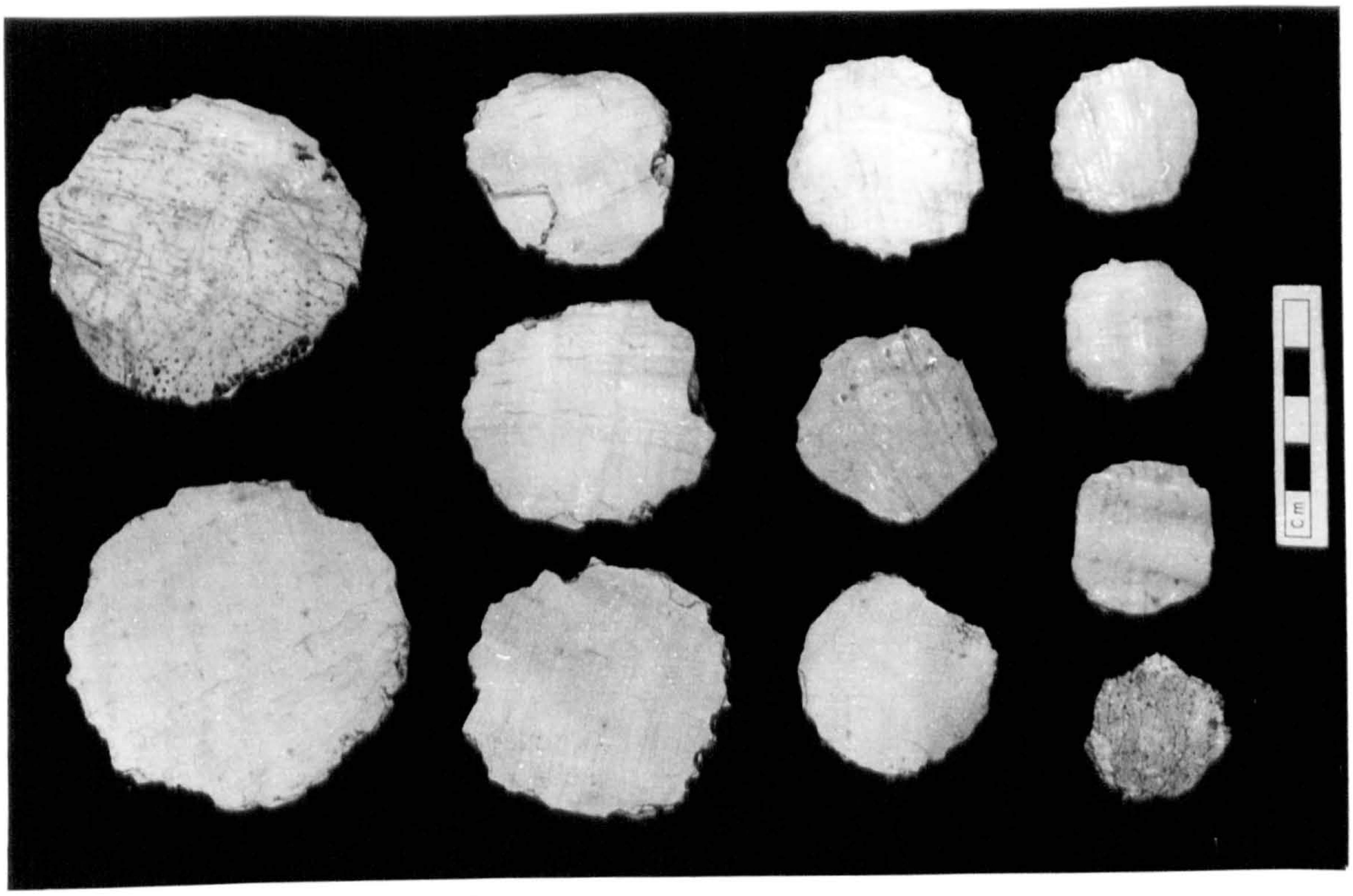


FIGURE 86. *Selection of discs made of Strombus gigas shell at DM site.*

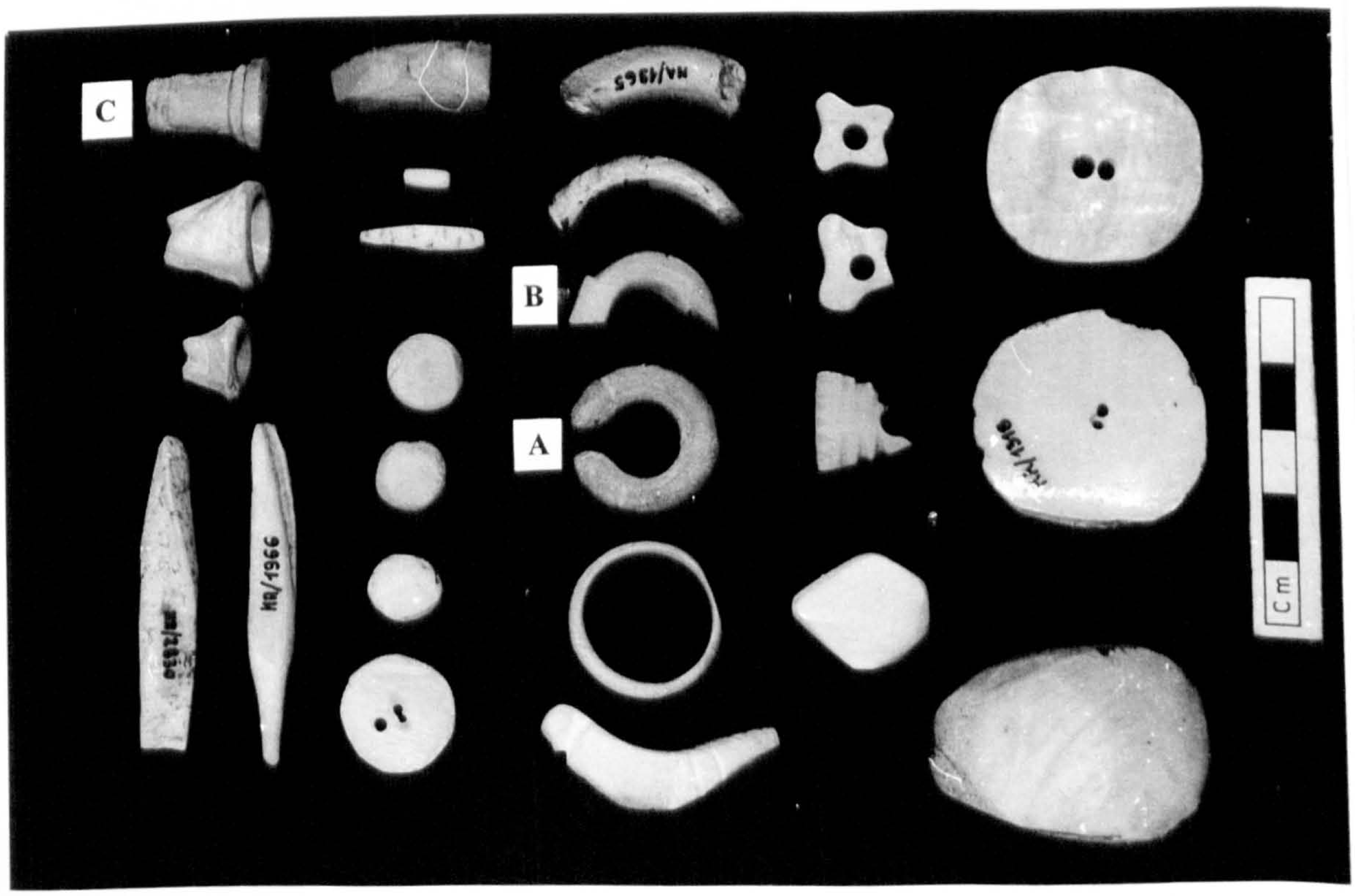


FIGURE 87. *Selection of artefacts made out of Strombus gigas shell: A - TR/H site; B,C - La Blanquilla Island; the rest DM site.*

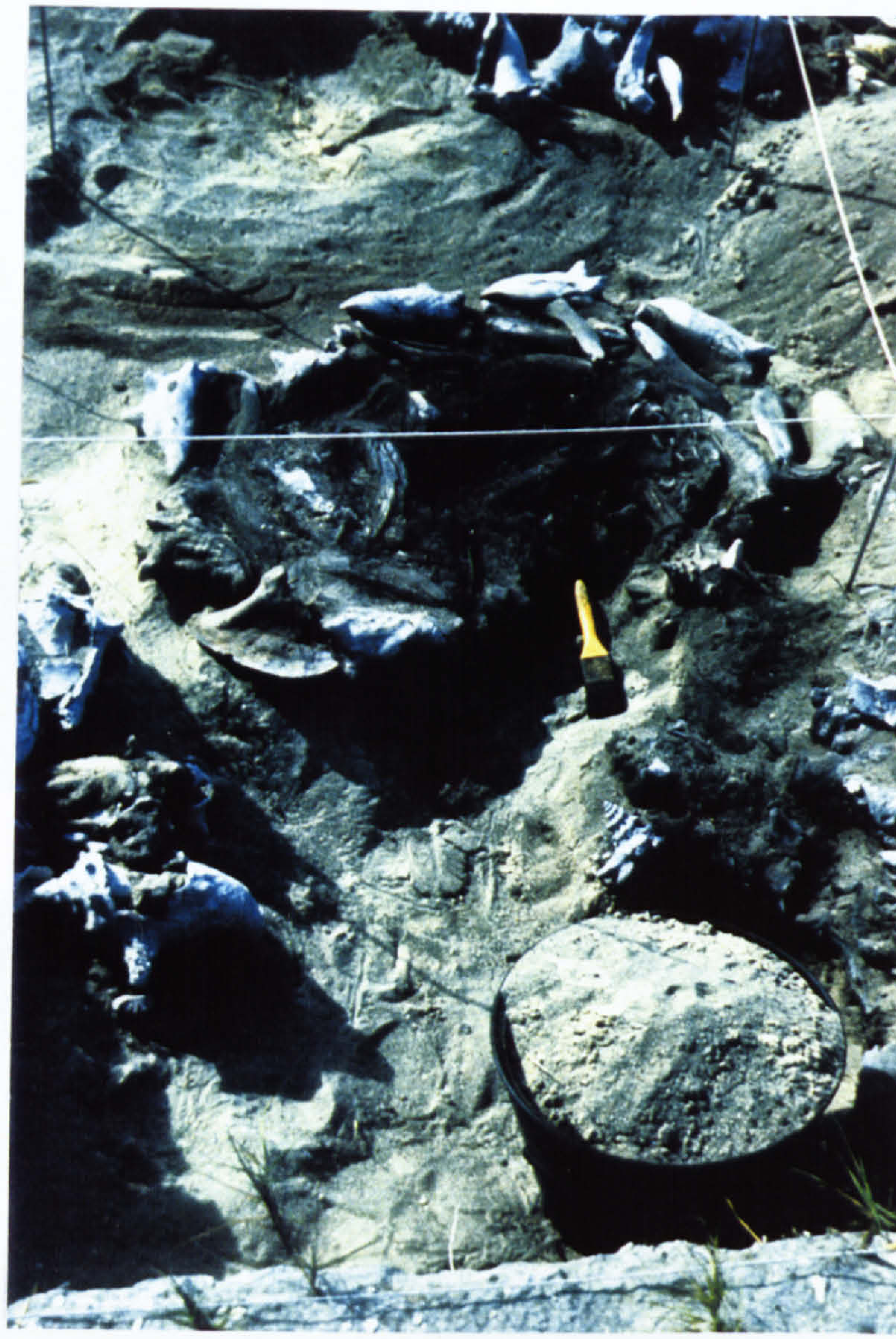


FIGURE 88. ***Hearth base made out of <u>Strombus gigas</u> shells (feature DM/C/FE; see Table 16).***

FIGURE 89. *Fish bone remains from DM site during laboratory analyses.*

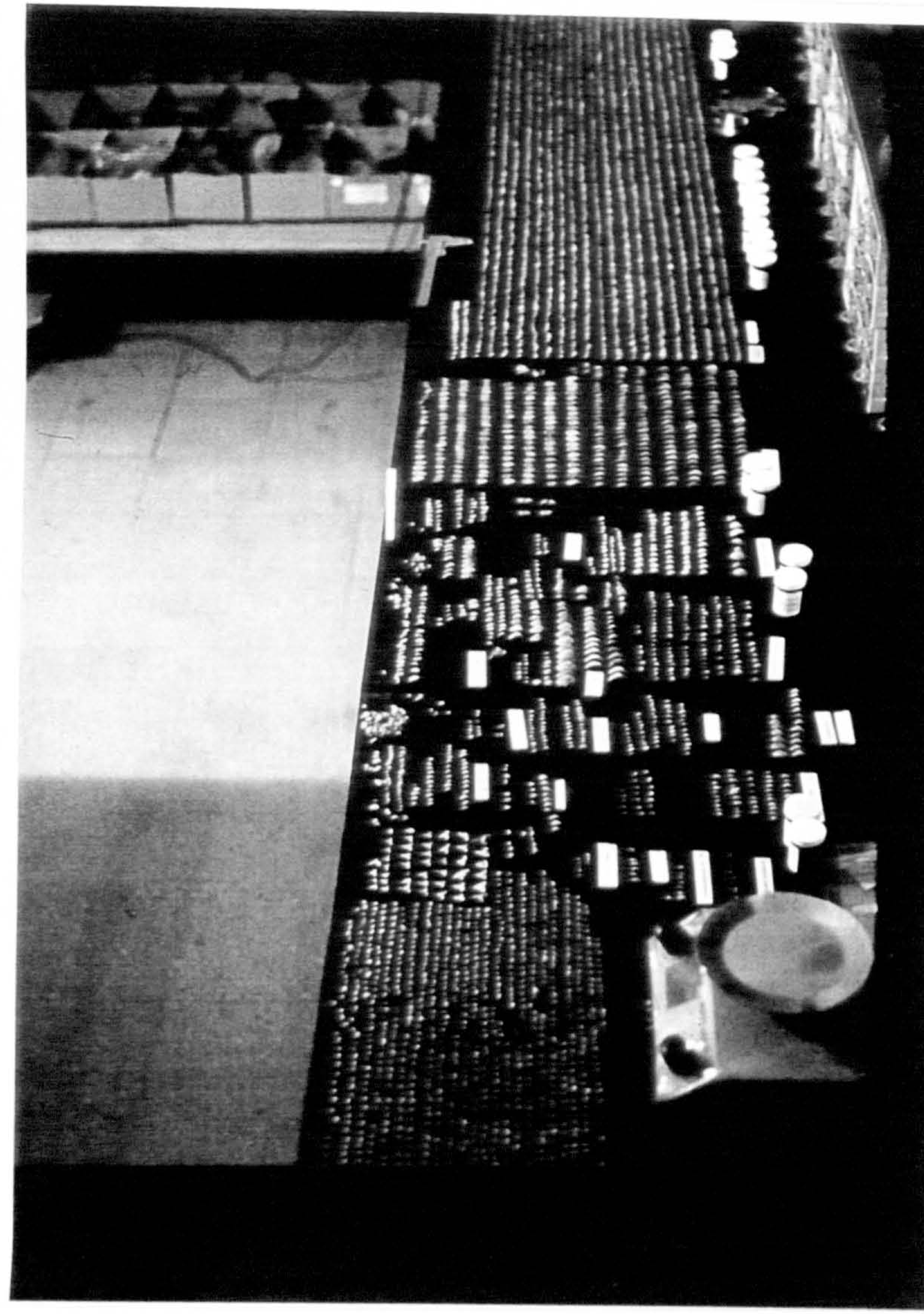


FIGURE 90. *Fish otoliths from DM site during laboratory analyses.*

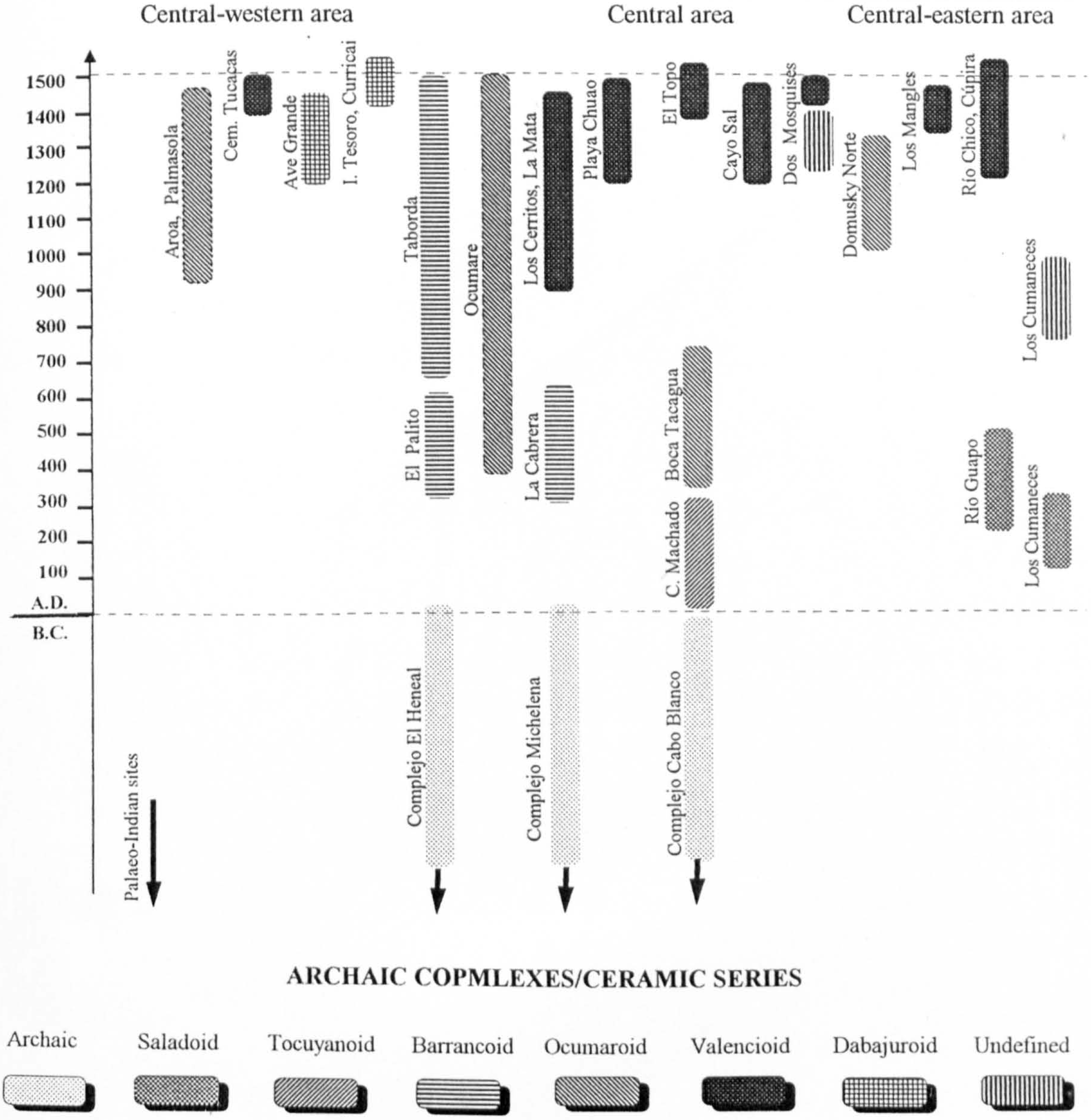


FIGURE 91. *Cultural chronology of north-central Venezuela.*