

THE CIRCULATION OF JADEITITE ACROSS THE CARIBBEANSCAPE

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The multi-vectorial distribution of the various forms of jade has received renewed attention in the Americas. This has resulted from two recent developments: the identification of artefacts in pre-Colonial contexts of the Antilles made of a variety of jadeitite which was purportedly obtained from the Motagua River Valley in Guatemala, the main source of this raw material documented thus far in Central America, and; the finding of jadeitite outcrops in Hispaniola and Cuba, which drastically alter previous notions regarding the geologic occurrence of this raw material in the western hemisphere. In this paper, I will discuss the implications of these findings for our understanding of the dynamics of interaction registered between the pre-Hispanic inhabitants of the Greater Caribbean.

La distribución multivectorial de las diversas formas de jade ha recibido una renovada atención recientemente en las Américas. Esto ha sido el resultado de dos eventos importantes: la identificación de artefactos en contextos precoloniales antillanos hechos de una variedad de jadeitita la cual fue probablemente obtenida del Valle de Motagua en Guatemala, la fuente principal de este tipo de material en América Central, y; la identificación de fuentes de jadeitita en La Española y Cuba, lo cual altera drásticamente las nociones previas en torno a la ocurrencia geológica de este tipo de material en el hemisferio occidental. En este artículo, se discutirán las implicaciones que estos hallazgos tienen para nuestro entendimiento en torno a las dinámicas de interacción registradas entre los habitantes prehispanicos del Gran Caribe.

La distribution multi-vectorielle des différentes formes de jade a fait l'objet d'un regain d'intérêt dans les Amériques. Ceci résulte de deux évolutions récentes : l'identification des artefacts dans les contextes précoloniaux antillais, fabriqués dans une variété de jadéite présumée provenir de la vallée de la rivière Motagua au Guatemala, source principale de cette matière première identifiée jusqu'ici en Amérique centrale, et la découverte d'affleurements de jadéite à Hispaniola et à Cuba, qui modifient radicalement les notions antérieures sur la présence géologique de cette matière première dans l'hémisphère occidental. Dans cet article, je débattrai des implications de ces trouvailles sur la compréhension des dynamiques d'interactions répertoriées entre les habitants préhispaniques de la grande Caraïbe.

“En la obtención de esas piedras, como todos los materiales que los aborígenes empleaban en la fabricación de sus objetos utilitarios, se practicaba un ritual especial de ayunos y abstinencias. Las piedras adivinatorias exigen cierta redondez y brillo para darle cierta atracción sagrada. Estas operaciones solían realizarse en el mismo río donde descubrían el material adecuado. Es posible que las mismas prácticas se aplicaran en la obtención de la materia prima de los jades” Aguilar (2003:78).

In the process of transforming a rock into a humanized object, the selection of particular raw materials plays an essential role. Raw materials were chosen not only on the basis of functional qualities such as their hardness or edge-retention capacity but also by virtue of ideotechnic considerations such as their colour, lustre, or place of origin. Some rocks were particularly valued in ancient times, being circulated across vast distances even when raw materials with similar qualities were locally available in their contexts of consumption. In the Americas, the type of rock that received the most extensive horizontal and vertical circulation was jadeitite. This type of rock has been found in archaeological deposits that span from northern Mexico to Colombia and the Antilles, in contexts that date from 1500 BC in the Olmec region all the way to the contact period.

Jadeitite derives its name from the word jade, which itself is derivative from the name recorded in 1565 by Nicolás Monardes - *pedra de yjada* - for making reference to a highly valued type of rock used to treat colics among the Aztec (Foshag and Leslie 1955; Harlow *et al.* 2007; Howard 2002). In addition to its curative qualities, the reasons for the importance of this type of rock varied markedly in time and space. For instance, jadeitite has been deemed to embody significations such as water or maize (i.e. fertility) for the Maya while among the Olmec it was revered because of its relation to serpent cult (Taube *et al.* 2004). Even today, the appeal of jadeitite continues to be manifested as, for example, through its use as the state and provincial gemstone of Alaska and British Columbia respectively and its employment to calm wrecked nerves in New Age therapy. Whole museums have been devoted to the study and display of artefacts made of this type of raw material, again underlining its salience both in the past and the present.

The significance placed on this type of rock has promoted it to be one of the best researched raw materials found in archaeological sites worldwide. Until recently, the available evidence indicated that primary deposits of jadeitite occurred in only two sources in the Americas: one in California and another in the Motagua Fault Zone in Guatemala. Of these, the Guatemalan source has received the most attention, since it has been deemed as the context from which most, if not all, of the jadeitite found in Mesoamerican and Isthmo-Colombian sites was obtained. However, the recent finding of Antillean jadeitite sources, particularly in Cuba and Hispaniola, demands that we reassess the vectors of distribution of this raw material in both the insular and continental Caribbean. In this work, I will evaluate the implications that the finding of jadeitite sources in the Antilles has for the understanding of pan-regional dynamics of the distribution of this raw material across the Caribbeanscape.

The Sources of Jadeitite

Jadeitite is a metamorphic rock composed primarily of the mineral jadeite, which occurs in serpentine-matrix *mélanges* that form at high high-pressure/low low-temperature in subduction environments from hydrothermal fluids released during dehydration of the altered oceanic crust (Harlow *et al.* 2006, 2007, 2010; Sorensen *et al.* 2006). Jadeitite (or jadeite

jade) is differentiated from its close relative, nephrite jade, by the fact that the former is composed mostly of jadeite pyroxene while the latter mainly contains felted tremolite-actinolite. Nephrite jade forms under different petrogenetic conditions (Harlow *et al.* 2007) and has a lower specific gravity and refractive index than jadeite. It is also softer and of more limited chromatic variation.

Due to the particular conditions required for the formation of jadeite, until recently only twelve occurrences of this raw material had been identified worldwide (Harlow and Sorensen 2005). Of these, only two sources of jadeite had been documented in the Western Hemisphere: one located in the New Idria serpentinite, San Benito Co., California, associated with the San Andreas Fault, and another situated in central Guatemala adjacent to the Motagua Fault Zone (MFZ). The Guatemalan source is one of the largest jadeite bearing areas in the world, extending for more than 200 km in lateral extent. It presents palpable differences both to the north and south of the MFZ, allowing researchers to discriminate with high degrees of resolution their provenance from either of those two areas (Harlow *et al.* 2006, 2010). While the jadeite found to the north of the MFZ contains albite, analcime, and white mica as important constituents, the one that occurs south of the MFZ also contains rutile, lawsonite, and quartz, which are essentially absent in the northern source. It is this southern occurrence the one argued as the most probable provenance for the jadeite used for the manufacture of the celts found in Puerto Rico, the Virgin Islands, and Antigua (Harlow *et al.* 2006, 2007), as will be discussed below.

It should be noted, however, that not everyone has agreed on the existence of a single jadeite source in Central America. Bishop and Lange (1993) have argued that the composition of the jadeite artefacts found in Lower Central American contexts are not consistent with that of Motaguan materials, thus proposing that there is a source somewhere in Costa Rica yet to be discovered. However, Harlow (1993) has argued that not only were the geological conditions appropriate for the formation of jadeite not present in Central America except the Motagua Fault Zone, but also that the composition of Motaguan jadeites is sufficiently variable to encompass the jadeite materials found in Costa Rican archaeological contexts.

Aside from the Central American jadeites, no other source of this raw material had been documented in the Americas. However, recent research conducted by geological teams from Europe, the Antilles, and the United States has recently documented jadeite occurrences in the insular Caribbean, particularly in northern Hispaniola and in the far east of Cuba, all of which seem to be geologically correlated to the Cretaceous high-pressure complexes of Central Guatemala (García Casco *et al.* 2009a). The Hispaniolan jadeite occurrence is located in a serpentinite *mélange* formed in a subduction channel located in northern Dominican Republic, west of Samaná, that forms part of the Rio San Juan complex (Schertl *et al.* 2007). Jadeites are found in this source both as lenses or blocks and as veins within lawsonite-bluechist blocks (Baese *et al.* 2010). These vary white to green in colour and, in addition to jadeite (more than 90% per volume) also contain as minor constituents quartz, pumpellyite, omphacite, and lawsonite, among others (Baese *et al.* 2007). Evidence of jadeite has also been uncovered in Cuba in one main source. It is located on the eastern portion of the island in Sierra del Convento (Cárdenas Párraga *et al.* 2010; García-Casco *et al.* 2009a). In this source area, jadeite objective pieces have been found in gravel bars and channels as well as in the mouths of the Macambo and Guardarraya rivers. The jadeite here was formed at higher temperature than typically interpreted for jadeite formation

but still in the context of serpentinite matrix *mélange* (García Casco *et al.* 2009a). Jadeitite occurs as in-situ deposits, detrital boulders, and secondary materials transported by high-energy fluvial systems in four different areas of this subduction *mélange* (Cárdenas Párraga 2010). Analyzed samples indicate that the jadeitite of talisman-quality is of a light green colour, “being formed by 95% pyroxene (jade ± omphacite) and albite, phlogopite and epidote (about 5%)” (Cárdenas Párraga 2010:202). Other components include white mica, apatite, quartz, dolomite, and chlorite. There is also a darker and more heterogeneous variety of jadeitite in this *mélange*, with more chromatic variation (from greenish white to dark green), also containing epidote and albite in larger amounts. The presence of jadeitite in the Cretaceous subduction complex of Escambray, in south-central Cuba, has been suggested but no confirmation of its occurrence in that high-pressure accretionary body has been provided (García Casco *et al.* 2009a).

It should be noted, however, that the evidence available is still incomplete, as new potential sources are likely to be found in other circum-Caribbean regions where geological conditions make feasible the formation of this type of rock. For instance, García Casco *et al.* (2009b) have identified other potential jadeitite occurrences in Margarita Island, Villa del Cura in north-central Venezuela, and the Guajira Peninsula in Colombia, none of which has been studied in detail. In Puerto Rico, the only potential source of this raw material cited in the geological literature is located deep underwater in the Puerto Rico trench, making it a very improbable source of humanly exploited raw material. The other potential occurrence is situated in the south-western part of Puerto Rico, in association to the Sierra Bermeja, Monte del Estado, and Rio Guanajibo serpentinite belts. Due to the fact that most of these serpentinites have been found within low pressure ophiolite bodies rather than in *mélanges*, it has been deemed that this region is an unlikely candidate for the presence of high-pressure blocks of jadeitite (Harlow 2010 and A. García Casco, personal communication).

Characterization Studies of Jadeitite in the Antilles

Recent research on Antillean pre-Colonial materials has documented the use of jadeitite for the production of personal adornments and bifacial ground stone tools in various islands. Although the employment of this raw material for artefact manufacture had been proposed since the early 20th Century in the Antilles (e.g. Harrington [1924] and Smith [1954]), it has not been until the last decades that characterization studies have been conducted in order to verify its identification with high degrees of resolution. This has been problematic as it has led to the misidentification as jadeitite of many fine-grained greenish rocks, particularly nephrite jades and serpentinites. In most cases, this has resulted in an overemphasis of the quantity of jadeitite artefacts found in some archaeological contexts. However, the pendulum has also swung in the opposite direction, as now we are beginning to identify new jadeitite pieces that had been previously mislabelled as other types of raw materials or included into the catch-all “greenstone” category. This lack of recognition of jadeitite might explain to an extent the absence in the archaeological literature of this material in Cuba and Hispaniola, despite the finding of occurrences of this raw material in those islands.

Although in association with the boom in Saladoid/Huecoid research in the insular Caribbean (particularly in Puerto Rico and the Lesser Antilles) that has taken place in the past three decades there has been an increase in emphasis in the detailed study of the semi-

precious stones involved in long-distance exchange for lapidary production (Chanlatte Baik and Narganes Storde 1983; Cody 1991; Murphy *et al.* 2000; Rodríguez López 1991; Sued Badillo 1979; Watters 1997; Watters and Scaglione 1994), there has been a dearth of characterization studies that have attempted to make fine-grained analyses of such raw materials. With few exceptions (e.g. Murphy *et al.* 2000) their identification and estimations about their provenance have been mostly based on their macroscopic observations and literature reviews. This is particularly problematic when considering that characterization research on jadeitite has shown that, due to the inhomogeneous character of this type of rock, whole rock analysis is of less utility for sourcing studies than the analysis of its minor mineral constituents (Harlow *et al.* 2007; Seitz *et al.* 2001).

Fortunately, although petrographic and chemical analyses of rocks have been slow to arrive to the Antilles, in recent years characterization studies have become much more common. The earliest recorded documentation of jadeite artefacts using characterization techniques comes from Puerto Rico where x-ray studies were conducted by geologists from the U.S. Geological Survey on several celt flakes and fragments (Smith 1954). Together with measurements of their refractive index (which spanned from 1,662 to 1673), hardness (7 in Moh's scale), and specific gravity (3.32), the analysis of these artefacts demonstrated that the raw material used in their production was jadeitite. In this study, the author argued that if this raw material was not procured from a yet unidentified jadeitite occurrence associated to the serpentinite belt located on the south-western part of the island, these were very likely "obtained from Costa Rica by the Arawaks or by the more adventurous Carib tribes, either directly or by transference via the Yucatan Peninsula, southern United States, or northern South America" (Smith 1954:26; translated by the author).

This study was followed more than three decades later in the Bahamas, where X-ray diffraction (XRD) was applied on a celt associated to a context dated circa AD 1000 from the Pigeon Creek site (Rose 1987). Although it was based on only one archaeological specimen, this analysis was of great importance since it led Rose to identify with precision the petrographic signature of this type of raw material and to argue that it was very likely obtained from the aforementioned Motaguan source. Furthermore, the presence of jadeitite on this site lends some support to de Booy's (1914) early observations on the finding of this raw material in several archaeological contexts of the Bahamas.

Although during the past couple of decades several characterization studies have been conducted on lithic materials from the Antilles (e.g., Havisser 1999; Knippenberg 1999, 2006; Murphy *et al.* 2000; Rostain 1995), no detailed studies of jadeitite artefacts had been undertaken until recently. The earliest of these recent jadeitite studies comprised the analysis of ten celts and celt fragments unearthed by Reg Murphy and colleagues from Saladoid contexts documented in Hill Reef and Elliotts sites in Antigua. This study was conducted by George Harlow of the American Museum of Natural History utilizing imaging and petrography, scanning-electron microscopy, X-ray diffraction, and *electron microprobe chemical analysis* (Harlow *et al.* 2006). The results of this study demonstrated that the mineralogy (particularly the presence of quartz, phengite, lawsonite, and white-tan mica) and texture of these bifacial ground tools more closely matched that of jadeitite from Guatemala, in particular that found south of the MFZ, than they do that of jadeitite from California or any of the other sources that had been identified at that time.

These results were replicated in analyses conducted by Harlow on jadeitite artefacts from Puerto Rico and the Virgin Islands. In Puerto Rico, x-ray diffraction studies on materials from the sites of Punta Candeleró, La Hueca-Sorcé, Río Tanamá, and Tecla I showed the employment of jadeitite of similar composition to that identified in Antigua for the production of six biconvex celts and one plano-convex adze (Harlow 2007; cited in Rodríguez Ramos 2007, 2010a, see below). The sites from which these were obtained not only indicate the widespread movement of this raw material in the island, but also show the marked vertical extension of its circulation since it has been found in association to sites that date between 450 BC and AD 1000.

Further testing on 36 artefacts (celts and personal adornments) from the Folmer Andersen Collection from St. Croix was conducted by George Harlow with the use of SEM and x-ray spectrometry (cited in Hardy 2008). The results of the analysis of the celts were consistent with those of Puerto Rico and Antigua. One interesting aspect of this collection is that it contained 16 ornaments, six of which were of the batrachian variety so conspicuous amongst Saladoid and Huecoid assemblages. In this analysis, none of these personal adornments were identified as jadeitite. In fact, thus far there has been no characterization study corroborating archaeological identifications of jadeitite used for ornament manufacture in the islands.

Although all of the aforementioned studies suggest a Central American origin for the jadeitites found in Antillean archaeological sites, most of them also acknowledged the possibility that these were procured from yet undiscovered Greater Antillean sources of this raw material. This is an important issue because the jadeitites found in Antillean archaeological collections have been argued to show some compositional concomitances with the recently identified jadeitite materials from Cuba and Hispaniola. For instance, Schertl *et al.* (2007: 10) indicate that there are marked similarities in both the mineral and fabric signatures between the Hispaniolan jadeitites and those found south of the MFZ. Particularly, the co-occurrence of quartz, lawsonite, and pumpellyite together with jadeite identified in the Hispaniolan occurrence has been deemed to correspond to what has also been observed in sources south of the MFZ (Maresch *et al.* 2008). This, according to Baese *et al.* (2007), may be pinpointing a Hispaniolan rather than a Guatemalan origin for the Antillean jadeitite materials.

The Antillean derivation of the jadeitites found in Greater Antillean sites was also proposed by García Casco *et al.* (2009b) on the basis of the analysis of materials from Cuba. They argued that “the rare occurrence of quartz in Antiguan jade and some Guatemalan samples (in addition to phengite, lawsonite, and glaucophane) indicated by Harlow *et al.* (2006) cannot be taken as diagnostic because similar quartz-bearing jadeitites are present in the Rio San Juan and Sierra del Convento mélanges.” However, Harlow *et al.* (2009) are still of the impression that the jadeitite artefacts that he has identified from Puerto Rico, the Virgin Islands, and Antigua have a Motaguan origin and more characterization research on materials from the Antilles is currently being undertaken in order to develop criteria for source discrimination with higher degrees of resolution.

It is evident from the previous discussion that, at present, the available geological data is not fine-grained enough to itself resolve the issue of jadeitite distribution in the Antilles. I will now turn to the archaeological evidence regarding the use of this raw material in the Antilles and surrounding continents, as it may prove very important to decipher the dynamics of circulation of this raw material in the Greater Caribbean.

Technological, Stylistic, and Contextual Considerations

The archaeological evidence available may be a very useful complement to geological information to at least begin narrowing down the potential sources of the jadeitites found in pre-colonial contexts in the islands. Particularly, the analysis of the consumption contexts, technological styles, and iconographic themes objectified in this type of material may shed some light into the probable areas from which the jadeitite found in Antillean archaeological contexts was most likely being procured through time.

The contextual information available thus far indicates that the earliest evidence for the consumption of jadeitite in the Antilles dates to the contexts dated between 500 BC and AD 500/700, which form part of what I have termed the Iridescent Period (Rodríguez Ramos 2010b). This period is characterized by the emphasis on the long-distance circulation of shiny personal adornments made of semi-precious stones and greenstone celts. The Antillean Iridescent Period corresponds temporally to the widespread distribution of Motaguan jadeitite between Guatemala and Costa Rica in association to what Guerrero Miranda (1993) labelled the Initial and Florescent Periods (500 B.C. to A.D. 700). Jadeitite artefacts uncovered from Huecoid and Saladoid contexts dating to this period unearthed from Puerto Rico, the Virgin Islands, and Antigua have been analyzed in detail by Harlow (2006, 2007) who, as previously noted, has argued that the most probable source for those artefacts is the Motagua River Valley in Guatemala.

Further support for the Motaguan provenance of jadeitities during this period comes from the fact that there is no evidence at this time of Huecoid or Saladoid contexts anywhere in Cuba or Hispaniola, nor is there any indication of the contemporaneous consumption of jadeitite by the pre-Arawak inhabitants of those islands. Therefore, at present, there is no archaeological support for the local exploitation or the extra-island distribution of jadeitite from Cuba or Hispaniola to Puerto Rico and the Lesser Antilles before AD 700 (the earliest date for the El Cabo site in the Dominican Republic where jadeitite celts have recently been identified; Samson 2010). Thus, the available negative archaeological evidence lends credence to Harlow's (2006, 2007) arguments for a Motaguan origin of the jadeitite found in the Antilles during this Iridescent period.

This, however, does not totally rule out a possible early interaction sphere within which jadeitite might have been moved east from Cuba or Hispaniola. In fact, we have argued for the existence of a "west to east influence corridor" during this time (Rodríguez Ramos 2001), which encompassed early interaction networks between Huecoid/Saladoid groups in Puerto Rico and pre-Arawak groups from Cuba and Hispaniola. These interactions led to the eastward movement of materials like chert blades and the negotiation of technological traditions such as the centripetal core reduction observed in Huecoid sites from Puerto Rico, both of which have been documented in pre-Arawak contexts in both Cuba and Hispaniola. Although this might be a very interesting possibility, at this point there is no confirming archaeological evidence that jadeitite was also transacted between Cuba/Hispaniola and Puerto Rico/Lesser Antilles in these early interaction spheres prior to AD 700.

Other lines of evidence that seems to point to a Motaguan origin for jadeitites found in the islands during this Iridescent period come from the stylistic and technological parallels noted between the personal adornments and celts produced at this time in the Antilles and Lower Central America, most notably in Costa Rica. Thus far, the earliest evidence for jadeitite celts available in the Antilles comes from the Huecoid context of Punta Candelero

in Puerto Rico, as well as from Saladoid contexts associated to white on red pottery from Puerto Rico, St. Croix, and Antigua. The widespread movement of jadeitite for celt production during this period is related to the circulation of other raw materials between the Lesser Antilles and Puerto Rico for celt making, which include cherty carbonate from St. Martin (Knippenberg 2006) and serpentinite (Rodríguez Ramos 2007, 2010a). Neither the production of petaloid celts nor the presence of either serpentinite or cherty carbonate has been documented in archaeological contexts west of Puerto Rico prior to AD 700, which seems to indicate that the inhabitants of Hispaniola and Cuba were not involved in these long-distance celt exchange networks.

A salient element of this celt production and distribution process during this time is the manufacture of the plano-convex adze associated exclusively to Saladoid contexts of Puerto Rico. Due to its association to mortuary practices and its lack of use traces at the macroscopic level, the plano-convex adze has commonly been considered to be manufactured for non-utilitarian activities (Rodríguez Ramos 2001, 2007; Siegel 1992). The evidence available thus far indicates that the production of this type of tool is not only absent in Cuba and the Dominican Republic, but also in Saladoid and Huecoid contexts of the Lesser Antilles and north-eastern South America. Interestingly enough, the production of plano-convex adzes is commonly observed between Costa Rica and Guatemala during this period. Particularly in Costa Rica, these are found without decorations, as pendants, or depicting the axe-god motif (Guerrero Miranda 1993). The fact that one of the bifacial ground stone tools of purported Motaguan jadeitite found in Puerto Rico is a plano-convex adze again seems to pinpoint to a Central American provenance of this raw material during this period.

Further support for a Central American origin of the jadeitite found in Antillean contexts comes from the iconography embodied in some of the personal adornments produced during this Iridescent period in the Antilles and Lower Central America. Although, at present, no characterization studies have been undertaken with lapidary artefacts made of jadeitite, we are currently conducting such analyses in order to ascertain their petrologic

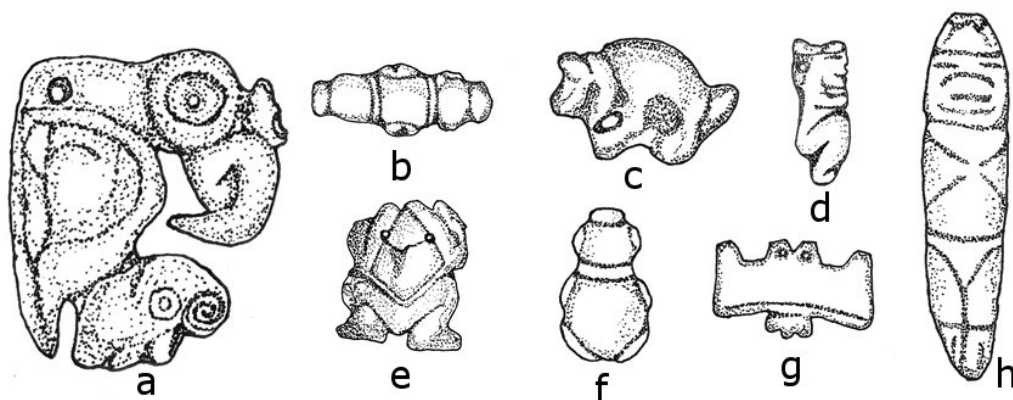


Figure 1 Themes objectified in personal adornments in Puerto Rico and the Lesser Antilles (a, beak bird, La Hueca-Sorcé; b, reptilian, La Hueca-Sorcé; c, curly-tailed, Tecla 1; d, squatted, Tecla 1; e, frog-shaped, La Hueca-Sorcé; f, batrachian, La Hueca-Sorcé; g, winged, La Hueca-Sorcé; h, axe-god, Antigua; modified from Chanlatte and Narganes Storde 2005, 2005; Murphy 2005).

signature and identify their likely source(s). Despite this limitation, there are other materials that played overlapping symbolic roles with jadeitite, collectively known as “social jades” (Guerrero Miranda 1993; Lange 1993) that were used in the Puerto Rico and the Lesser Antilles in order to objectify an assemblage of themes of macro-regional significance, while not being found thus far in either Cuba, Hispaniola or north-eastern South America during this time (before AD 500/700). Among the most conspicuous of these themes in both the Antilles and the Isthmo-Colombian area are those embodied by the beak-birds pendants, winged motifs, curly-tailed emblems, reptilian images, axe-gods amulets, and batrachian-shaped adornments (Figure 1).

Of these, the most salient one is the beak-bird motif depicted by a raptorial bird with either a deformed human head or an animal clasped in its claws, observed primarily in Huecoid contexts in Puerto Rico and Vieques. As noted elsewhere (Rodríguez Ramos 2007, 2010a; Rodríguez Ramos and Pagán Jiménez 2006), these present marked similarities with jadeitite beak-bird pendants recovered from contemporaneous contexts of the Caribbean Watershed of Costa Rica. As is the case in Costa Rica, many Antillean researchers have identified this ornitomorphic icon as representing a king vulture (e.g., Allaire 1999; Boomert 2000). However, as has been discussed with Julio Sánchez (2010 personal communication), ornithologist of the Museo Nacional de Costa Rica, the anatomical features of the birds depicted in the Huecoid pendants are indeed indicative of condors, as had been argued by Chanlatte and Narganes (1983, 2005). This ornithologist notes that morphological elements such as the location of the carbuncle, the protuberance of their dorsal sides, and the clear presence of sexual dimorphism are apparent morphological indicators of this raptorial bird.

Furthermore, the fact that in the Huecoid specimens the bird is carrying a body in their claws supports such identification since the king vulture has weak feet and short claws, so they tend to feed standing over the carrion. This perhaps is why the king vultures depicted in Costa Rican lapidary work have their beaks connected to their preys, very likely indicating an act of feeding, while the ones from Huecoid contexts have them clasped in their claws, which seems to be denoting an act of flight. Whether this schematized animal representation objectifies different interpretations of a myth using different but related animals (i.e., a vulture cult; see Benson 1997) as has been documented in the Antilles (“mythic substitution” from jaguars to dogs; Rodríguez López 1997; Roe 1995) or different parts of a mythical narrative, among other possible interpretations, is an issue worth exploring further. Moreover, the importance of analyzing in more detail the symbolising of this icon becomes more apparent when considering that the condor is nowhere present in the Antilles or north-eastern South America, which indicates that it might represent some totemic image that served to associate the performers of this Huecoid tradition to an ancestral location in the lower Isthmo-Colombian area. This Isthmo-Antillean relationship is also indicated by the fact that, as is the case of Costa Rican specimens, the negative spaces within the Huecoid beak-bird pendants are produced with the use of string sawing. Interestingly, this technique has only been documented in contemporaneous contexts to those of Puerto Rico in Costa Rica, Ecuador, Mexico, and south-eastern United States.

Another of the themes observed in the Antilles at this time, which forms an integral part of Costa Rican iconography, is the axe-god motif. In Costa Rica, this motif is made exclusively over jadeitite obtained from the MFZ. It usually depicts an avian or an anthropomorphic image whose head is invariably located in the proximal section of plano-convex

adze-shaped objective pieces. In the Antilles, a piece that echoes stylistically this axe-god theme was found in the Mill Reef site in Antigua made out of what has been identified as nephrite jade (Figure 1h). Interestingly, the Antiguan axe-god pendant has its figurative portion surmounted towards its proximal end, thus perhaps indicating some sort of inverted iconography in comparison with Costa Rican specimens. As is the case in the Costa Rican exemplars, the one from Antigua was drilled transversely for suspension, which showcases another very particular technological element shared between these areas.

This use of transverse incision has also been observed in the production of batrachian-shaped amulets from Puerto Rico and the Lesser Antilles that are conceptually similar to those of Costa Rica and Panama, while being absent in Cuba and Hispaniola at this time (see Rodríguez Ramos 2010a, 2011 for detailed comparisons). This is also the case for the other themes objectified in Saladooid and Huecoid lapidary artwork in Puerto Rico and the Lesser Antilles (curly-tailed motifs, winged pendants, and reptilian images). The absence of artefacts indicative of the participation of the inhabitants of Cuba and Hispaniola in the pan-regional negotiation of this symbolic repertoire is very important because it again indicates their lack of integration in the social networks within which these themes were circulated and consumed during this time.

In sum, the available iconographic, contextual, and technological evidence indicates that jadeitites used in Antillean contexts prior to AD 500/700 were not likely obtained from Cuba or Hispaniola, but rather from the MFZ, as has been argued by Harlow (2007; Harlow *et al.* 2006). However, the picture becomes more complicated after AD 700, when jadeitite artefacts begin to be found in Hispaniola and, eventually, in Cuba. This coincides temporally with the interruption in the pan-regional networks within which jade (both jadeitite and social jade) used in lapidary production was circulated in Costa Rica, Puerto Rico, and the Lesser Antilles, which in the insular Caribbean marks the onset of what I have termed the Nucleation Period (Rodríguez Ramos 2010b). While in Lower Central America this seems to be related to a shift from the circulation of jadeitite to the widespread movement of gold-copper alloys (*tumbaga* or *guanín*), in the Antilles the shift seems to be focused on the production and distribution of wood artwork as is evidenced by accompanying shifts in lithic technologies (Rodríguez Ramos 2010b.). Although the distribution of lapidary materials made over semi-precious stones drastically declines at this time, the long-distance movement of celts made of jadeitite continues to be of marked importance in the Antilles.

It is after AD 700 that the earliest evidences of jadeitite use have been uncovered from Hispaniola and Cuba. The earliest context where jadeitite has been identified by trained geologists in either of those two islands has been that from the site of El Cabo, located in eastern Dominican Republic, which dates between AD 700 and 1500 (Samson 2010). Studies are currently under way to determine if the jadeitites used for these celts are from the local Hispaniolan source or were imported from outside the island (either from Cuba or the MFZ). The use of jadeitite for the production of celts has also been observed in eastern Cuba in association to “Taíno” contexts that likely date post-AD 1000. Studies conducted by Mendoza *et al.* (2009) have indicated that the jadeitite employed in the production of these materials was obtained from the Sierra del Convento region, thus demonstrating the beginnings of the exploitation of this raw material during this time in that island.

After AD 500/700 the macro-regional circulation of jadeitite celts intensifies in Puerto Rico and also extends farther into the Lesser Antilles as well as into the Bahamas (after AD 850). In Puerto Rico, detailed studies corroborating the import of jadeitite celts dating to this period have been conducted by Harlow (2007) on materials from Rio Tanamá. An inspection of the archaeological collections housed at the *Museo de Historia, Antropología y Arte* of the *Universidad de Puerto Rico* has shown that the use of jadeitite for celt production in Puerto Rico during this time is much more conspicuous than previously thought, as these seem to be found in most collections, albeit in small numbers in each of them (Figure 2). This increase in emphasis in the consumption of jadeitite celts in Puerto Rico coincides with an interruption of the distribution of cherty carbonate celts from St. Martin to the island as well and of serpentinite celts and axes. In the Lesser Antilles, however, cherty carbonate celts continued to circulate east of St. Martin together with jadeitite celts that were likely moved down the island chain in a west to east axis. Jadeitite celts have been identified (based on visual inspections) in Coakley Bay and Estate Adrian in St. Croix, Estate Anguilla in St. Johns, Golden Rock in St. Eustatius, Forest North in Anguilla, Kelby's Ridge in Saba, Anse a la Gourde in Guadeloupe, and several other islands, going all the way down to sites near Balembouche in St. Lucia. Interestingly, in all of these locations, the available evidence also indicates that this raw material constituted a rather small portion of



Figure 2 Jadeitite celts from Puerto Rico (*Museo de Historia, Antropología y Arte, Universidad de Puerto Rico*).

the celt assemblages. This scarcity of jadeitites in the overall composition of the collections, together with the fact the ideological load usually imbued to this raw material, might be indicating its continued use in ceremonial exchange as had been argued by Boomert (1987) for the circulation of greenstones in the northern Amazon. Its numinous qualities are evidenced by the finding of two jadeitite petaloid celts placed as offering in a burial context in the Monserrate site in eastern Puerto Rico.

At this point it is unclear if the jadeitite found in Puerto Rico and Lesser Antillean archaeological contexts at this time was obtained from the MFZ *and/or* from any of the sources identified in either Cuba or Hispaniola. However, the archaeological evidence indicates that it is very likely that after AD 700 there is an increase in emphasis in the Antilles in the consumption of jadeitite celts obtained from Cuba and Hispaniola, as suggested by the aforementioned decline in the pan-regional circuits that promoted the long-distance circulation of jadeitite south of the MFZ. This does not mean that the import of Motagua jadeitite completely ceased, but that the local sources likely became increasingly important



Figure 3 Petaloid celts, Paso del Indio, Puerto Rico.

through time in the Antilles. After AD 850, Cuban and/or Hispaniolan jadeitite was moved north into the Bahamas together with other materials recovered from archaeological contexts that purportedly were obtained from those islands (Berman 2000; Keegan 1992).

After AD 1000, the role of celts in the articulation of superstructural traditions of pan-regional significance seems to have become particularly relevant in the Antilles. After this time, celts become highly elaborated, most notably those petaloid in shape recovered from Greater Antillean contexts, which present morphologies unlike any other celts observed in the circum-Caribbean region (Figure 3). These petaloid celts are characterized by high degrees of burnishing, a type of termination that seem to have more to do with their aesthetic qualities (i.e., shininess) than their functionality (see Rodríguez Ramos 2001 for a discussion on this issue).

The rather conservative manufacturing guidelines that seem to have been followed in the production trajectories of these celts in different islands serve as an indicator of the ideological integration that took place between the participants in the articulation of the late pre-colonial symbolic reservoir which I have called “Taínoness” (Rodríguez Ramos 2007, 2010a). The routinization of the tenets of this superstructural mosaic not only involved the creation of formalized ritual spaces (i.e. *bateyes*) in the Greater Antilles, but also the production of ritual paraphernalia for public display that included monolithic and decorated axes, stone and wooden *dubos*, stone belts, and elbow stones made of locally available materials. All of these artefacts embody a symbolic code that seems to become increasingly antilleanized during the late pre-colonial history of the islands (see Hofman *et al.* 2007; Oliver 2009). Concomitant with this, there seems to be a decrease in intensity in the long-distance distribution of jadeitite east of the Dominican Republic. Perhaps, this illustrates a ritual realignment in which the ideological capital carried by jadeitite in earlier times gave way to a more intense reliance on the symbolic grammar that objectified the tenets of the aforementioned spectrum of “Taínoness,” which was variably negotiated by the inhabitants of the Greater and the Lesser Antilles.

This antilleanization of superstructural traditions, however, does not mean that contacts with Lower Central America that might have promoted the import of jadeitite, among other materials, from that area completely ceased. In fact, there are clear indicators of Isthmo-Antillean contacts, as is for instance expressed by the import of *guanín* or tumbaga, whose production was limited to the Isthmo-Colombian area and Mesoamerica at this time. Other artefacts such as the tripod *metates* with decorated panels quite similar to those recovered from Costa Rican contexts have been obtained from sites in the Greater Antilles. This, together with many other lines of information (see Rodríguez Ramos 2007, 2010a, 2011 and Rodríguez Ramos and Pagán Jiménez 2006 for a detailed discussion), shows the continued existence of pan-regional communities of practice articulated by maritime webs of social traffic during the late pre-Colonial history of the Greater Caribbean.

Concluding Remarks

As has been made evident throughout this work, jadeitite was a raw material of vast importance for the societies that inhabited both the insular and the continental Caribbean. Although its meaning, significance, and the vectors of its distribution seem to have varied through time and space, this raw material remained as a highly valued commodity for around 3000 years in the Greater Caribbean.

The recent finding of the Antillean sources of jadeitite opens a whole new avenue of research regarding the mechanics of distribution of this raw material at both the local and pan-regional levels. Although we are still not at a point to make definitive statements regarding the dynamics of circulation of jadeitite in the insular and the continental Caribbean, in this work I have attempted to present some insights into what the archaeological evidence available seems to be pointing to. On the basis of contextual, iconographic, and technological evidence, I have argued that the jadeitite found in Antillean contexts that pre-date AD 500/700 has a Motaguan origin as argued by Harlow *et al.* (2006) on the basis of characterization studies. I have also suggested that the picture becomes more blurred after AD 500/700, when it seems that the Antillean sources of jadeitite come into the mix and become inserted into previously delineated interaction networks that extended between the Greater and the Lesser Antilles, as well as with the continental Caribbean. The long-distance circulation of jadeitite seems to decline after AD 1000 east of the Dominican Republic, when other types of meta-volcanic rocks were used in the production of highly elaborated celts and other types of lithic sumptuary artefacts.

Although I have mostly circumscribed the present discussion to the circulation of jadeitite, it is evident that the distribution of this raw material should not be seen in a vacuum. This is particularly the case when considering the information that is being generated from the study of metallurgical, botanical, malacological, and ceramic materials, all of which indicates the existence of multiple intersecting maritime networks that were articulated across the Caribbeanscape in which raw materials, finished products, information, symbols, and esoteric knowledge were being circulated across geographic and cultural frontiers.

Some of these interactions seem to have entailed engagements between peoples from the insular and the continental Caribbean. This raises the question of the possible Antillean origin of some of the jadeitite raw materials that have been found in Costa Rica and Mesoamerica, which might to an extent help to explain the variability that has been noted by Bishop and Lange (1993) in Lower Central American collections. The fact that there are products from the Antilles in the Isthmo-Colombian region is to be expected, since long-distance transactions tend to be reciprocal in nature (Renfrew 1986; Stein 1998). This makes evident that further studies are needed in both the insular and the continental Caribbean in order to determine with higher degrees of resolution the vectors of distribution of this raw material, which may allow us to begin unravelling the nature of the millenary interactions that took place across the Caribbeanscape.

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