



## Bitumen residue on a Late Ceramic Age three-pointer from Marie-Galante, Guadeloupe: Chemical characterization and ligature evidence



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### ABSTRACT

Among the most recognizable and enigmatic artefacts found in pre-Columbian archaeological contexts of the Ceramic Age in the Greater and Lesser Antilles is the three-pointer, a triangular shaped object made of various mineral and organic materials. Despite a few ethno-historic mentions and abundant academic speculations, little is known about the social and spiritual dimensions these once animate objects had in the Amerindian Antillean communities. Furthermore, very little can be empirically verified. The wide array of known specimens shows many variations, including the presence/absence of usually poorly preserved traces of black residue, often described as plant tars, resins or gums, or as inorganic bitumen. Well preserved residues of this type have been observed on a three-pointer specimen recently discovered in a Late Ceramic Age context (Troumassoid series, 10th–11th century AD) of the Tourlourous site on the island of Marie-Galante (Guadeloupe, French Lesser Antilles). They have been physico-chemically characterized as bitumen, and they preserve evidence of a specific tying system. These data raise considerations on two points: the necessity to better document these sometimes tenuous clues of tying and adhesion systems implying bitumen (and other glues), and the need to consider that three-pointers (and other artefacts), while actively used in the mediation between social and spiritual dimensions, also have a practical side which should be addressed in technological terms in order to better understand all their dimensions.

### 1. The world of three-pointers: Between symbolism and function

Three-pointers<sup>1</sup> are among the most recognizable and enigmatic artefacts found in Amerindian pre-Columbian archaeological sites in the Antilles. They are characteristic of the Ceramic Age of the Lesser and Greater Antilles, which begins around 500 BCE after a multi-millennia sequence of pre-Ceramic/Archaic occupation by groups who settled most of the Caribbean islands (Boomert, 2000; Keegan, 1994). In the Lesser Antilles, the Ceramic phase is marked by the arrival of horticultural, pottery-making Saladoid peoples coming from the South American mainland (Oliver, 1999; Rouse, 1986, 1992; Rouse and Cruxent, 1963). Typical ceramics of the Cedrosan Saladoid subseries are subsequently found in Trinidad, Tobago, most of the Lesser Antilles and the eastern Greater Antilles as far as the eastern tip of Hispaniola (Bonnissant, 2010; Keegan, 1994, 2000; Rouse, 1986, 1992; Siegel, 2010; Veloz Maggiolo, 1991). During this early phase of the Ceramic

Age, a relative cultural unity is manifested through similarities in the prevailing ceramic assemblages, settlement patterns and economies (Petersen, 1997; Rouse, 1992; Wing and Wing, 1995). A Late Ceramic Age phase is defined after ca. 600 CE/800, when regional ceramic styles diversify within the Ostionoid and Troumassoid series and associated subseries. During this phase the colonization of the entire Lesser and Greater Antilles and the Bahamas is completed. This period of divergent local developments, population movements and increasing social complexity produces a mosaic of societies, not yet fully understood, which dislocates during the contact period after 1492 (Keegan, 2000).

Three-pointers are thought to be indigenous to the pre-Columbian Antilles (Boomert, 2000: 488–489). They are omnipresent throughout the Ceramic Age sequence. They appear as early as the 3rd century BC in Puerto Rico (Rouse and Alegría, 1990: 30–31; Walker, 1993: 44) and during the first few centuries AD in the northeastern Antilles (Hoogland, 1996: 80, 84), especially between eastern Hispaniola and

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<sup>1</sup> Also called *trigonoliths* in French or *cemtes* in Spanish.

the Guadeloupean archipelago. They persist through late pre-contact times in the Greater as well as the Lesser Antilles. Most large and sculpted three-pointers occur between eastern Hispaniola and Puerto Rico during the late Taino period.

Their characteristic shape is triangular with three extremities projecting outward. Breukel (2013: 18) defines them as sharing “a basic conical template which often assumes a triangular or oblong three-pointed shape,” but this shape shows many, sometimes subtle, variations including size. Indeed, specimens vary from tiny objects to very large ones. Some show a concave base, a grooved concavity on the basal surface or a grooved furrow underlining the base. Some are plain while others are decorated with incised facial, corporal or abstract motifs including recurrent herringbone patterns.

In archaeological contexts, three-pointers have been found made of various rocks, corals, shell species and, more rarely, ceramic (Allaire, 1974) or bone (Fewkes, 1922: 155). Some were probably manufactured in wood (Petitjean Roget, 1983) and some possibly in cotton and other soft materials that did not survive in the archaeological record. They are found complete or broken in a variety of deposits including post-holes, refuse middens, etc.

Ethno-historical records mention three-pointer-like objects as being imbued with *zemis* (*cemis*), that is, spiritual, immaterial, numinous and vital forces that can be related to deities, ancestral spirits or landmarks. This suggests they were not inanimate objects but potentially living social entities invested in socio-economic realms such as fertility, curing power or power legitimization, among others (Boomert, 2000, 2001, 2013; Oliver, 2009; Petitjean Roget, 1997; Rodríguez Ramos et al., 2013; Roe, 1982, 1997; Siegel, 2010).

These objects have drawn much academic attention, debate, and speculation, with attempts at typologies started early in the 20th century (Breukel, 2013; Clerc, 1973, 1976; De Hostos, 1923; Fewkes, 2009 [1907]; Petitjean Roget, 1983; Petit-Jean-Roget, 1993; Veloz Maggiolo, 1970; Walker, 1997), often based upon local, restricted assemblages. Despite the constant research on these objects and various postulates in terms of their function and significance, very little is empirically verifiable (Boomert, 2000: 488–490). This is due to their omnipresence across time, their polymorphic appearance, their subtle as well as large-scale variations (in material, size, shaping details, iconography, etc.) and the likely polysemous messages they carry. Their polymorphic nature is probably the reflection of some deep symbolism as well as of variable functions and meanings, evolving in time and across communities and spaces. Deciphering such plastic representations, their meanings and functions—on a local and time t community scale—is a challenging, almost impossible, task with regard to non-writing societies (Testart, 2006). The «sign» being polysemous, a common representation can be associated with a plurality of meanings by dispersion (multiple meanings organised around a major initial content) or even inversion (the same sign having one meaning and its opposite).

Besides the obvious spiritual dimensions three-pointers had in the pre-Columbian Antillean societies, practical or even functional aspects need also be considered for these objects regarding the ways they were handled: they may have been deposited in spiritually animated places (springs, trees, etc.), buried in gardens as symbolically fertilizing energies, and exhibited as power marks by shamans or chiefs. Furthermore, they also may have been involved in utilitarian tasks, as suggested by some scholars (Barbotin, 1987: 15, 65; Petitjean Roget, 1983: 522), such as grinding, pounding or planting. Such various ways of handling, carrying, keeping or showing the three-pointers may have involved additional materials, larger compositions or inclusion in composite objects, implying the potential use of cords or ligatures that sometimes might have been affixed with tarry adhesives. These dimensions may be more accessible to reading by archaeologists and may open ways to start to decipher other dimensions of these objects.

## 2. Residues on three-pointers

The preservation of residues of bitumen or plant extracted tars, resins or gums on three-pointers and other objects is a fairly common phenomenon. The utilization of such products as adhesives, varnishes or coatings for ceramics, canoes or other items among pre-Columbian Antillean populations is sparsely but clearly described or mentioned in descriptions by a few chroniclers (Las Casas, 1957: 36; Oviédo y Valdes, 1959; Pané, 1974) and thus quite commonly inferred for archaeological objects.

Recently physico-chemical analyses have been carried out on rather unique archaeological objects extracted from museum collections, including three-pointers, duhos, wooden sculptures and statuary elements from the Greater Antilles and the Bahamas (Ostapkowicz et al., 2011, 2012, 2013). They confirm that plant extracted resins of the Pinaceae family, especially the Caribbean pine *Pinus caribaea*, and of the *Protium* (copal) and *Bursera* (gum tree) genera were commonly used on this variety of objects. Bitumen is not that often described or retrieved.

When found, such residues usually have appeared on simple archaeological objects, occurring as a few poorly preserved micro-traces fortuitously trapped in surface irregularities. While these residues were probably more common, the probability of their being preserved is a result of the sequence of alterations the discarded three-pointer underwent: i.e., exposure to open air, to humic acids in the archaeological context, intense washing or conservation treatments during archaeological or museum processes.

Although such residues on three-pointers of the Lesser Antilles appear fairly commonly, including a few specimens from Guadeloupe (Clerc, 1974, 1976: 42), they have been described only on a very limited scale (Breukel, 2013). The residues usually appear deteriorated and only partially preserved. While few if any have been physico-chemically analyzed, their nature is often inferred as being plant extracted tars, resins or gums, or bitumen (Breukel, 2013). This is the case for the specimens described with such residues from Guadeloupe (collections of the E. Clerc Museum, Department of Guadeloupe, Le Moule) by E. Clerc (1974, 1976: 42; Durand and Petitjean Roget, 1991). On most of these, the remaining traces are mostly located on both basal points and, in some cases, on the lower surface of the base. This brought Clerc, very early, to suggest that these residues were probable traces of a tying system coated with “bitumen,” helping attach the object to a stand or a handle.

In 2012 a three-pointer with exceptionally informative residues was found during an excavation carried out on the Tourlourous site on the southeastern coast of Marie-Galante (southern Guadeloupe, French Lesser Antilles). It was recovered from a Late Ceramic Age context of the site, representing the Troumassoid series. This artefact presents well preserved, remarkable amounts of black residues that generate several working considerations. It is, moreover, associated with other three-pointer specimens as well as other artefacts which, although fragmentary, also show residues.

## 3. The Tourlourous Troumassoid specimen

Marie-Galante is an island located in the southern part of the Guadeloupean archipelago, in the French Lesser Antilles (Fig. 1). Its pre-Columbian occupation is fairly well documented, starting with a known pre-Ceramic Age presence during the 2nd millennium BC (Fouéré et al., 2014). Most sites on the island, however, date to the Early Ceramic Age, between the 2nd and 9th centuries AD, and to the Late Ceramic Age, between the 9th and 15th centuries AD (Barbotin, 1970, 1987; Bodu, 1985; Bonnissent, 2011; Boomsma and Isendoorn, 2001; Casagrande, 2013; Chenorkian, 1998; Emond, 1980; Gassies, 1995; Honoré, 2013; Lenoble et al., 2012; Stouvenot, 2004). Some of the later settlements are cave sites that were mostly visited during the Troumassoid phase, between the 10th and 13th centuries AD (Courtaud et al., 2005, 2014; Grouard et al., 2014; Lenoble et al., 2008; Stouvenot,

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