Archaeological investigations between Cayenne Island and the Maroni river : a cultural sequence of western coastal French Guiana from 5000 BP to present

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Chapter 9

The Cimetière paysager Poncel site

A Late Ceramic Age satellite site in the swampy hinterland of the pleistocene ridges

After the presentation of PK 11, we will now discuss the results on the excavation of Cimetière paysager Poncel (No. 97309.106), which is also situated on Cayenne Island. It is located on a small Precambrian hilltop in the swampy hinterland of the Pleistocene sand ridges and shares similar ceramics, revealing a cultural link between both sites (van den Bel et al. 2013; Annexe 1.6).[218]

9.1 Introduction

On Wednesday 19 April 2000, after continuous diluvial rains, the northeastern side of Mont Cabassou slides through the hamlet of Poncel into Crique Cabassou, killing ten people (Fig. 9.1). In the wake of this disaster, the route had to be reconstructed. The subsequent pedestrian survey conducted by Eugène Epailly, Eric Gassies and Alain Gilbert along the future road track, evidenced remnants of the later excavated colonial site: the late 17th century Picard plantation (Mestre 2005).

This discovery launched a mechanical survey led by INRAP members in April 2002. It confirmed the presence of the Picard planation but also led to the detection of a pre-Columbian site at the summit of a hillock located between Poncel and the so-called Brazilian village of BP 134, dubbed *Morne Poncel* (Jérémie 2002b). When the municipality of Rémire-Montjoly unfolded their plans to construct a so-called "landscape cemetery" (Fr., *cimetière paysager*) upon this hillock, another complementary mechanical survey was conducted by Matthieu Hildebrand in order to a gain better insight of this pre-Columbian site (Hildebrand 2004). Eventually, when starting the compliance excavation in 2010, this project provided the CPP acronym symbolizing Cimetière paysager Poncel.

Hildebrand dug mechanically eight trenches on the summit of this hillock and estimated the distribution of the artefacts at a depth of between 20 and 60 cm, for a surface measuring *c*.8000 m². The site presented a rather dark coloured soil. All in all eight features were recorded of which three were considered postholes and one a possible ceramic deposition, i.e. F 6 (Hildebrand 2004, Plate 4). The latter feature also yielded the first radiocarbon date for this site (KIA-25851,

218 In September 2013, the results of the excavations at Cimetière paysager Poncel have been presented by the present author at the *Third Encounter of Amazonian Archaeology* (EIAA III) held in Quito (van den Bel 2014).

Figure 9.1. An aerial photograph of the new Route Nationale, the Cabassou landslide at Poncel (Géoportail 2007). The red rectangle represents the allotment AS 114 of the future cemetery whereas the yellow rectangle represents the 2010 excavation.

985 ± 20 BP). This result corresponded with the ceramic material which shared numerous stylistic elements with the Katoury site (Hildebrand 2004:21).[219]

Having discussed the geology and archaeological history of Cayenne Island in Section 8.1, we will now continue this introduction dealing with the methods and techniques applied in the course of this excavation. Although both sites are dated to the LCA, it must be remembered, however, that CPP is located on the summit of a small hillock in the swampy hinterland of the Pleistocene ridges on which PK 11 is situated (Fig. 9.2).

219 'L'assemblage se caractérise par une forte distribution des décors plastiques par rapport aux décors peints. On remarque un ensemble basique composé des modes « oblique simple », « oblique alternée » et du genre « treille », rassemblant plus de 50% du mobilier incisé. Les autres modes, beaucoup moins fréquents comme le mode « tiret » ou le mode « vague », apparaissent cependant plus emblématiques, et sont révélateurs d'une production singulière, endémique ou d'échange, que la représentativité du mobilier ne permet pas encore de déterminer. Le genre décoratif incisé est en majeure partie positionné sur la paroi externe des artefacts, les applications internes restant assez rares, à l'exception de quelques bases et du mode « tiret ». La classe décorative peinture a en revanche une répartition plus uniforme. Les aplats sont presque aussi souvent apposés sur les parois externes qu'internes des objets, et plus rarement sur les deux faces. A de rares exceptions le mobilier est recouvert d'un engobe rouge typique appliqué en bandeau sur certains éléments morphologiques mais plus généralement de manière uniforme. Les associations restent assez rares, mais la présence d'un col à bandeau rouge et incisions sub-labiales alternées permet de caler le site sur le même segment chronologique que celui du site Katoury. Un autre élément plus anecdotique, étant donnée la petitesse du fragment présente un mode décoratif typique du mobilier des sites mont Grand-Matoury et Thémire, calés sur une fourchette chronologique semblable: motifs géométriques blancs sur fond rouge.'

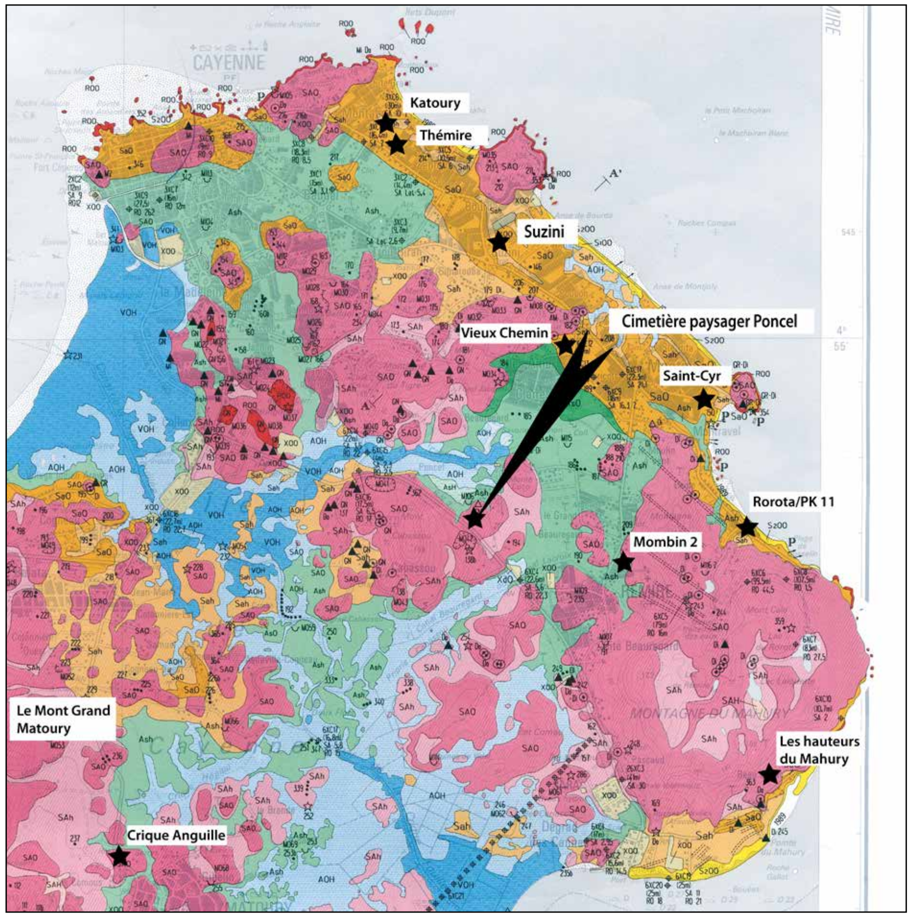

Figure 9.2. A geological map of Cayenne Island (Cautru 1993). Blue (clay) and yellow (sand) represent the Holocene deposits. Orange (sand) and green (clay) represent the Pleistocene deposits. Purple and red represent the Precambrian Shield. The excavated LCA sites are indicated with a black star and Cimetière paysager Poncel by means of an arrow.

The excavation methods

The SA delimited the future excavation area measuring 8000 m² several days before the excavations started. The scientific goals of this excavation had been defined on a single page which can be translated as "get the most out of it."[220]

Firstly, the summit of the hillock was deforested by mechanical means. Needless to say, archaeologists followed the proceedings at close range in order to protect any large items or artefact depositions. Once the hilltop was deforested we were able to observe its general shape and microrelief. At forehand this was rather difficult due to the dense secondary forest. After several days, however, we were able to set out the topographic grid, axed NNW-SSE, following the sloping hill we had made accessible by means of mechanical shovesl. Now, along this axis, a grid of 5 x 5 m was installed while hammering small wooden sticks into the ground in order to to collect artefacts during the mechanical decapage (Fig. 9.3).

When starting the decapage, we dug two long trenches with a width of 5 m not only in order to explore the artefact density of the dark top soil but also to estimate the potential of any features to be discovered at the summit of the hillock, to wit the Squares G2-M2 and M2-14 (Fig. 9.3). We found very little artefacts in the dark layer which appeared to be either worked or ploughed in

220 For the Scientific Charges or *Cahier des Charges* imposed by the SA for this project, see the field report (van den Bel et al. 2013).

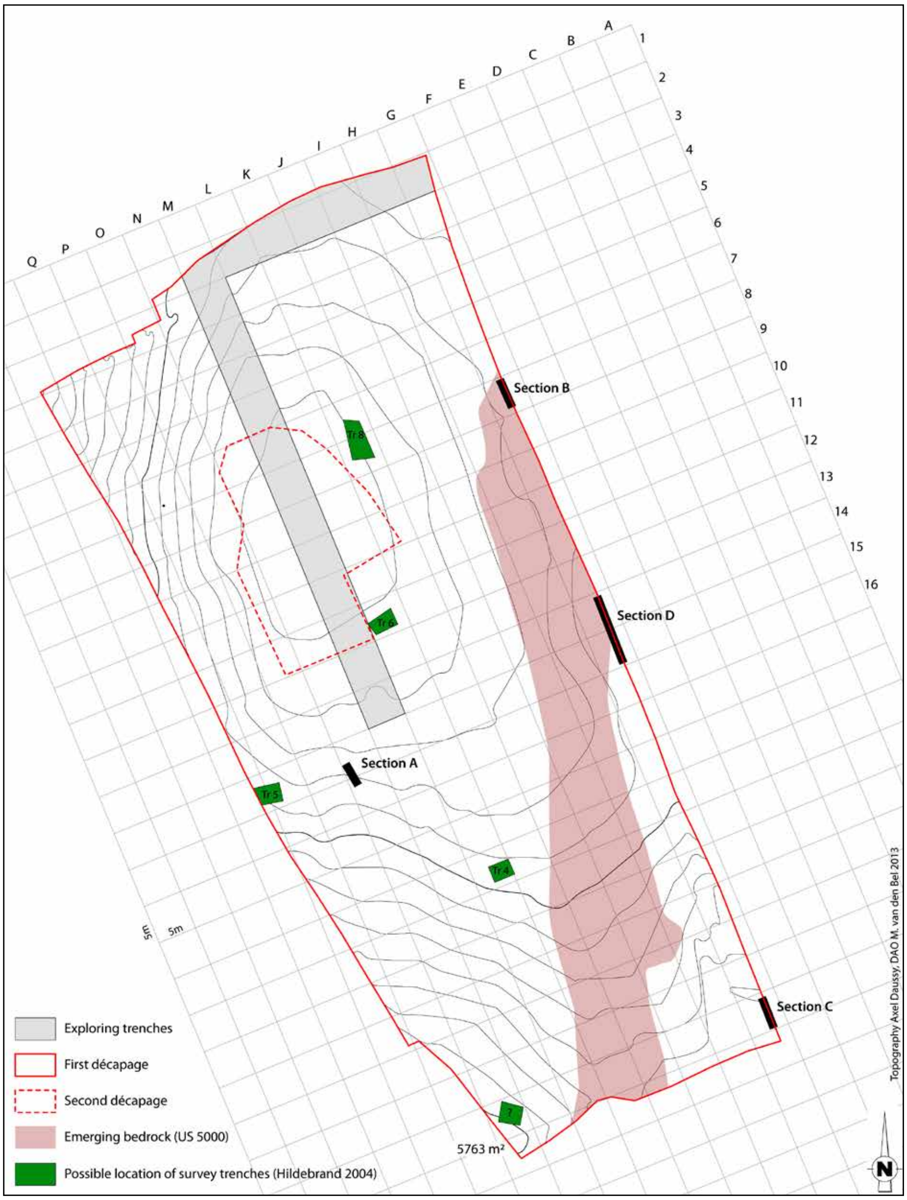

Figure 9.3. A general plan of the CPP excavation. We observed the 5 x 5 m grid, the possible location of the 2004 exploration trenches and the bedrock emerging in the excavation.

relationship with cacao plantations (partially still present at the site), presumably dating from the 18th century on.

Secondly, the low feature density, as predicted in the survey of 2004, caused us to abandon the collecting of material in squares as to the total surface in order to aim at a restricted area with features. Therefore, we continued the decapage with two machines, weighing 22 tonnes, to ultimately cover a surface measuring nearly 0.6 ha (5,763 m²). However, important (large) artefacts (e.g. querns, milling stones), were collected within the 5 x 5 m grid. Moreover, five recent disturbances within the perimeter of our excavation were detected, probably corresponding to trenches Hildebrand had dug in April 2004 (Fig. 9.3). However, we are not sure as to the numbering of these trenches as they were topographed in a local grid and never attached to the National French grid, i.e. WSG 84, UTM Zone 22N.

The depth of our excavation was guided by means of either the appearance of the sterile, yellow coloured subsoil at *c.*60 cm deep or the sterile, red coloured disintegrating bed rock. The latter lateritic emergence runs N-S across the excavation pit, representing the spine of this hillock. A second excavation level, measuring *c.*550 m^2, was dug at the summit of this hilltop once the extensive *décapage* had been completed in order to check and/or verify any other or deeper features at this site's dense feature area.

In addition, four deep trenches were dug within the excavation pit by means of a small machine (6 tonnes) in order to get a better grip on the site's geology. For each profile a stratigraphic section description was forwarded by the INRAP geomorphologist, Dominique Todisco (now at the University of Rouen, France). Axel Daussy provided the topography. Soil and charcoal samples were taken in order to undergo a further analysis and will be discussed in the following chapters.

9.2 The geological setting

9.2.1 Introduction

The Morne Poncel represents a foothill of the Mont Cabassou which rises *c.*160 m above MSL. It is part of the earliest Precambrian formations of French Guiana and ascribed to the *Ile de Cayenne* geological series as are: Montagne du Tigre, Mont Saint-Martin, Mont Mahury, Mont Grand-Matoury, etc. (Cautru 1993). The Mont Cabassou is deprived from tidal sediment accretion because of the presence of obstructing Pleistocene ridges situated between Montabo, Mont Bourda, Mont Saint-Martin, Mont Ravel (formerly Montjoly) and Mont Mahury. Therefore the drainage system (Crique Cabassou) surrounding Mont Cabassou leads to the Cayenne and Mahury Rivers. This drainage system disposing of pluvial water is characterised by means of natural depressions which form swampy areas, known as inundated or wet savannahs (cf. Fig. 9.2).

According to the pedological map drawn by Claude Marius (1969), the soil of Morne Poncel is dissimilar to soils from the other hillocks surrounding Mont Cabassou and Morne Coco, situated to the northeast. According to Marius' map this soil is a 'sol ferralitique induré sur une cuirasse de nappe de bas de pente,' i.e. a ferralitic soil on duricrust. At the foot of the morne one encounters the 'sols ferralitiques appauvris modaux,' i.e. poor ferralitic soils (cf. Section 2.2.5). Even lower, hydromorphic soils, such as gley podzols, can be found to the north of Crique Cabassou. However, they belong to the Old Coastal Plain which represents a vast, grassy savannah with forested islands or stretched (palm) forests, corresponding to old filled up canals or active irrigating creeks respectively. One must keep in mind that, when discussing the (paleo)environment of Cayenne, it is often difficult to imagine such landscape considering the rapid urbanism on Cayenne Island, as pointed out with regard to PK 11 (cf. Section 8.1).

9.2.2 The stratigraphic observations

After deforestation, an aligned outcrop of rocks presented itself at surface level, as above-mentioned, reflecting the bedrock or spine of the hillock (US 5000). The disintegration or alteration of these rocks represents a coating layer (US 4000) with spatial variations as to its texture: siltier to the east of the bedrock emergence and clayeyer to the west. Indeed, we observed a smaller inclination at the eastern flank compared to the much steeper western flank. Thus, when rain falls on the hilltop, the excessive water would probably descend towards the east, as evidenced here by means of an eroded area, interpreted as a run-off gully (F 202 and F 203).

Four sections were documented within the perimeter of the excavation of which the first is located at the summit (Section A) and the other three concern the excavation's northeastern wall profile (Sections B-D) (Fig. 9.3). The description of these four sections indicated a similar, relative succession of stratigraphic layers. This enabled us to reduce these sections to a single schematic one, consisting of five stratigraphic units (Fig. 9.4).

The upper part of the profiles measures *c.*40 cm and consists of a humic, sandy silt layer containing artefacts. Its upper part, measuring between *c.*5 and 10 cm in thickness, represents the forest floor (US 1000). The lower part, situated at a depth of between 5 and 40 cm, corresponds to a dark coloured layer which is entirely restructured. In it ceramic material as well as fragments of charcoal were detected (US 2000). Below this first, superficial part, we observe a silt layer (slightly sandy and clayey) measuring between *c.*20 and 30 cm thick which is homogeneous and has a light brown to yellow ochre colour (US 3000). A clay layer corresponding to the alteration of the bedrock (US 4000) emerges as a N-S stretching row of boulders within the excavation's perimeter. The non-altered red coloured bedrock (US 5000) was reached in a number of sections during the excavation (e.g. pit F 158).

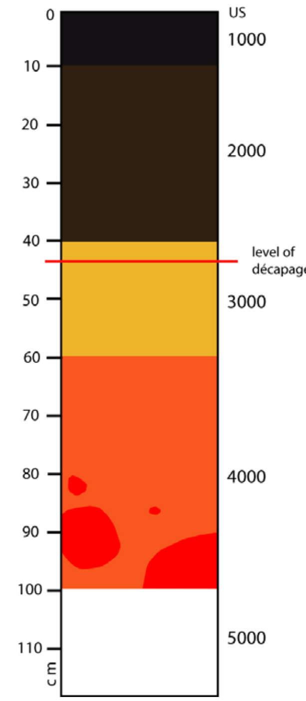

Figure 9.4. A schematic section of the site.

9.2.3 The interpretations

In general, the morphology of the Precambrian hillocks of Cayenne Island are topped or "crowned" with a duricrust (Fr., *cuirasse*). Its hardness and extension vary depending on the formations. The duricrust represents ancient terraces (Gibbs and Baron 1993; de Vletter et al. 1998; Théveniaut and Delor 2004; cf. Section 2.2.1).

All ferralitic soils of Cayenne Island are highly desaturated. The clay fraction consists mainly of kaolinite and iron oxides with some gibsite. The soil of Morne Poncel has been ascribed to 'sols ferralitiques indurés en cuirasse ou carapace.' In majority, they develop on bedrock rich in iron and magnesium (e.g. diorites, dolerites, amphibolites). These soils have a reddish brown colour at the surface as well as a crumbly structure. At a deeper level, we come across a red-ochre colour with a well-developed, fine polyhedral structure and certain concretions (Marius 1969:20–21)

However, our observations during the excavations illustrated that the profiles rather resembled a 'sol ferralitique rajeuni' as found on diorites and dolerites. In fact, Marius described this too with regard to his profile 'L1023' (Marius 1969:22). This specific soil belongs to the same group, but is attributed to another subgroup which fits in better with our observations at Morne Poncel.

The process of *rajeunissement* of the soils explains the emergence of the bedrock at a relatively low depth and can be related to a progressive, slow reputation of material on the flank of a hill, better known as "soil creep," or creeping soil (Heimsath et al 2002). This rather misunderstood process manifests itself on slopes and often consists of a slow movement of matter due to bioturbation and the effect of moistening/desiccation of this matter. Nevertheless, as mentioned above, pluvial water flowing towards the lateral (eastern) edge of the summit can certainly transport material. As to this matter, such a *rajeunissement* may explain why our ferralitic profile is not thicker than *c.*2 m.

Another general distinction can be made between the description by Marius and the CPP profiles concerning the dark colour of the upper or surface layers, i.e. US 1000 and 2000. This darkened colour is probably linked to the earliest human occupation at this site, thus not to the possible influences of the more recent cacao plantations. Its thickness, colour and crumbly structure (bioturbation) appear to be the result or the consequence of human activities, either voluntary or involuntary. A similar discussion was provided with regard on CSL (cf. Section 5.2.4). As to CPP, we were not able to carry out this type of research due to a small budget. In general, soil analysis provides specific pedological or chemical signatures reflecting excrement and waste deposit areas (Oonk et al. 2009; Woods 2003).

9.3 The radiocarbon datings

The Poznán Laboratory in Poland (cf. Appendix 1) analysed 15 charcoal samples. During the excavation we had chosen samples as to future dating from hand-dug anthropogenic features in order to obtain a more reliable association with features and the site's occupation. From all these samples we selected those collected from secure, anthropogenic features found in the entire excavated surface in order to obtain insight into its spatial character. Our main goal was to determine the occupations of this site and to establish a chrono-typology concerning the ceramic series (Table 9.1).

The probability of the calibrated ages at 2σ is rather satisfying with the exception of sample POZ-44836 taken from F 201 which is earlier. All the other results show a range between 100 and 200 years which can be considered too coarse with regard to establishing a ceramic chrono-typology. Despite this inconvenience we can state this site was occupied between *c.*AD 900 and 1400 which corresponds to the LCA.

Table 9.1. The results of the radiocarbon measurements. Atmospheric data from Reimer et al. (2009), calibrated at 2σ with OxCal v4.1.5 Bronk Ramsey (2010).

Feature	Type	C^{14} age BP	Cal. 2σ	Lab. No.
F 10	post hole	645 ± 30	AD 1281 - 1396	POZ-44817
F 18	inhumation pit	1035 ± 35	AD 896 - 1118	POZ-44819
F 54	ceramic deposition	685 ± 35	AD 1264 - 1391	POZ-44820
F 66	pit	655 ± 30	AD 1278 - 1394	POZ-44821
F 85 (EC 54)	pit with ceramics	770 ± 40	AD 1185 - 1289	POZ-44822
F 143 (F 143.1)	inhumation pit	655 ± 25	AD 1281 - 1392	POZ-44823
F 158 (Fill E)	deep pit	1635 ± 30	AD 342 - 535	POZ-44824
F 165	square	675 ± 30	AD 1272 - 1391	POZ-44828
F 192	post hole	355 ± 30	AD 1453 - 1635	POZ-44829
F 193	inhumation pit	895 ± 30	AD 1040 - 1215	POZ-44830
F 197	post hole	965 ± 30	AD 1018 - 1155	POZ-44831
F 199	pit with ceramics	895 ± 35	AD 1039 - 1215	POZ-44832
F 199 (EC 230)	sherd	895 ± 30	AD 1040 - 1215	POZ-44834
F 200	pit	675 ± 30	AD 1272 - 1391	POZ-44835
F 201	inhumation pit	9590 ± 50	9198 - 8792 BC	POZ-44836
F 6 (Survey 2004)	ceramic concentration	985 ± 20	AD 998 - 1156	KIA-25851

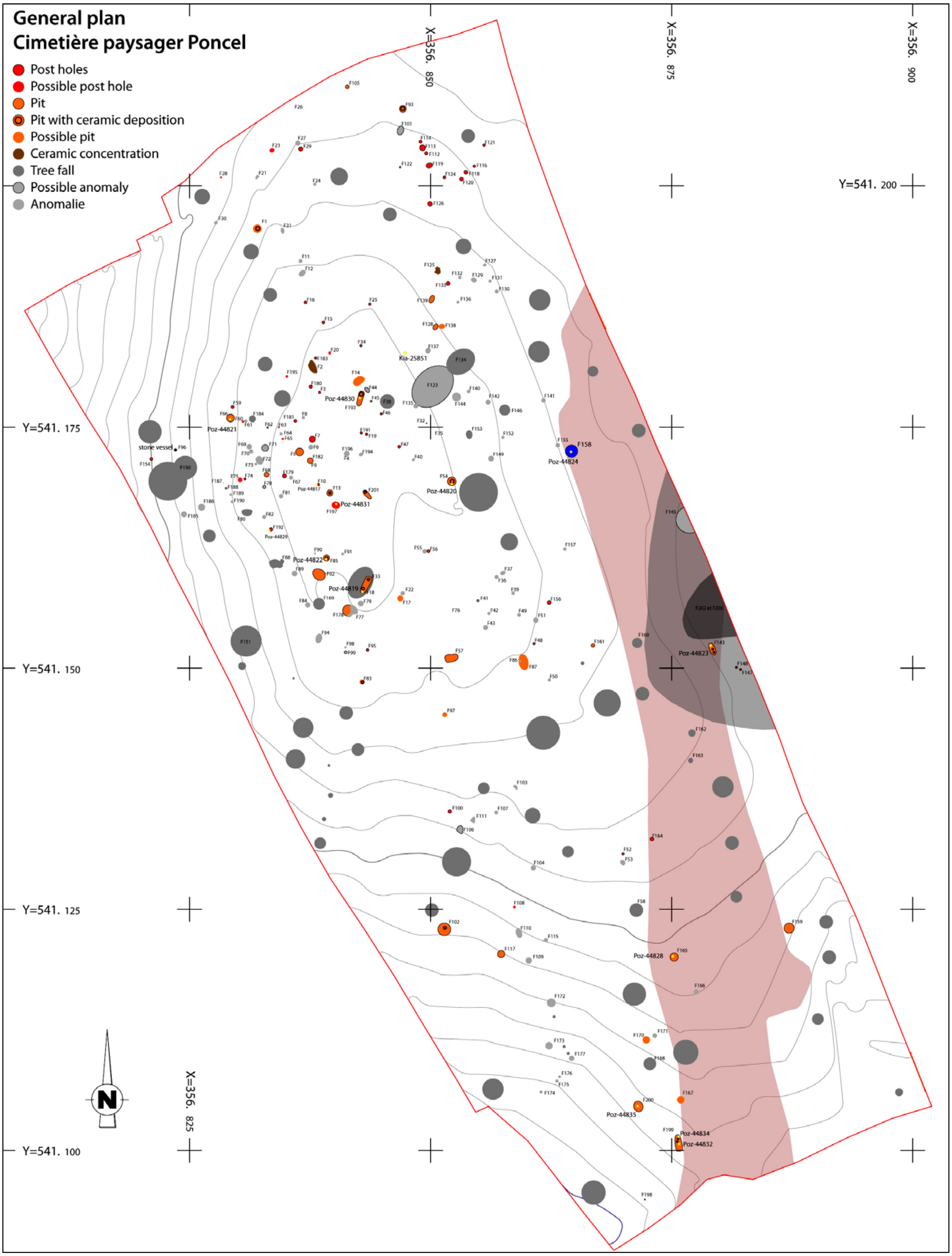

Figure 9.5. The general excavation plan.

The rather small summit of this hillock and the relatively long occupation span for this site evokes the necessity or possibility to divide this time span into two occupation phases at a 2σ range since it is absent at 1σ. The most recent phase (comprising POZ-44817, 20, 21, 23, 28, 35) falls between AD 1260 and 1400 whereas the earliest phase (represented by POZ-44819, 30, 31, 32, 34, 51) ranges between AD 900 and 1220. Two results remain: the date of pit F 85 (POZ-44822) situated between both hypothetical series and the most recent one (POZ-44829) which falls in the period of the European Encounter.

For the moment, we can conclude that this occupation range is common to Cayenne Island. Other sites with a similar range are: Mont Grand-Matoury, PK 11/Rorota, Katoury, Mombin II, Saint-Cyr, Vieux Chemin and Les Hauteurs du Mahury. The majority of these sites share the peculiarity of a possible earlier and a later phase: (a) in *c.*AD 1000 and/or (b) in *c.*AD 1300 respectively (Grouard et al. 1997; Grouard and Tardy 2003; Mestre et al. 2005; Delpech 2013; van den Bel 2007c, 2007d).

Thus, it is to be suspected that these phases reflect two occupations and/or two populations (?), as we have pointed out with regard to Crique Sparouine (cf. Section 6.5). Or, perhaps a third possibility: merely two different moments in time when a more intensified occupation was present at the site. A detailed ceramic analysis may serve to test this hypothesis (Section 9.5). This phenomenon may be the result or the consequence of two climatically dissimilar periods during the LCA in the Guianas as well as the Caribbean, as pointed out above (cf. Section 8.8). Moreover, it may also be possibly related to the worldwide dropping of the mean temperature in *c.*AD 1300, known as the Little Ice Age. This may have had an impact on the pre-Columbian populations in general (Dull et al. 2010).

9.4 The features

Below the dark earth layer (US 2000) numerous dark features were identified, contrasting with the yellowish brown coloured subsoil (US 3000) or reddish, crumbly bedrock (US 4000). Each feature was dug up by hand in order to characterise their origin: all the anthropogenic features were attributed to the pre-Columbian period and represent the remnants of a pre-Columbian hamlet. We did not identify a (large) waste area within the excavated perimeter. As mentioned above, the summit did not yield many artefacts. We therefore presume that, if any waste areas were present, this waste may have been thrown down the slopes of the hillock into the unexcavated area. The small quantity of tangible material observed during the entire decapage was interpreted as residual or erratic material belonging to the occupied area.

In total, 203 features have been identified of which 187 were excavated after the first decapage. Sixteen more were identified after the second decapage at the summit (Table 9.2 and Fig. 9.5). The majority (N=186) of the features were excavated in the US 3000 layer whereas four features were excavated in the dark layer (US 2000) and 13 in US 4000. It is important to emphasise that the second decapage, measuring *c.*550 m², does not correspond with a second occupation layer: the surface of the summit surface was merely excavated at a slightly deeper level, i.e. 10 to 20 cm, in order to make sure that no features were missed during the first decapage. However, three double features were counted in this manner (cf. Annexes 7.1 and 7.5).

Type	N
Post hole	51
Pit	26
Concentrations of ceramics	4
Ceramic deposition	6
Lithic deposition	3
Pit with ceramics	8
Deep pit	1
Run-off	2
Anomalies	102
	203

Table 9.2. The general feature count.

It must be added here that features were recognised mainly by means of a dissimilar colour or texture and the presence of archaeological material. It is certainly possible we have "missed" a number of features unrecognisable to the naked eye, i.e. a similar fill as the subsoil and/or without artefacts. However, we consider the loss of features to be small as we rely on our field expertise which is again the case regarding the interpretations of the features. Despite many efforts to record, characterise and discuss the features during our fieldwork, a large number hereof were called anomalies. This category refers to all natural features (notably treefalls, root and animal holes), but may also contain unidentified features of which we were not able to determine a natural or anthropogenic origin.

9.4.1 The description of the features

The pits

A total of 36 features have been interpreted as pit features. They consist of 26 simple pits containing artefacts, eight with ceramic depositions, and one very deep pit. Their outline at excavation level is round with the exception of five elongated pits. The shape of the latter can be described as rectangular with rounded corners. They contain one or multiple complete ceramic depositions and/or discarded depositions, i.e. F 18+33, F 143, F 193, F 199 and F 201. When excavating this type of large, but relatively shallow features, one can easily define the limits of the pit by means of the dissimilar texture and the fact that sherds are often found in a vertical position against the pit wall. Entire ceramic vessels are placed at either end of the rectangular pit whereas fragments of broken vessels appear to be deposited randomly but in a voluntary way, as they were rather easy to refit at our home base. These pits measure between 120 and 170 cm long and between 40 and 55 cm wide, creating a pit with perhaps the dimensions of a stretched human body. Although we did not find any bone (burnt or unburnt) or other tangible (human) proof, we consider the pit's shape and the deposition of the ceramics to comply with an inhumation grave. Once the pit was emptied, we could certainly imagine an individual –possibly wrapped in a hammock– being placed in such a tomb (Fig. 9.6).

Pit F 199 is probably the best example together with F 143. Here beautiful ceramics were deposited at one end of the pit, presumably at the deceased's feet. Pit F18+33 was first excavated as two different features, but a ceramic analysis indicated that fragments from both pits fit. This caused us to opine that both features belonged to one and the same elongated pit disturbed by a treefall as the second *décapage* confirmed. However, one must not forget the possibility that post-mortem activities may have resulted in the deliberate fragmentation of this pit's content. The majority of these pits were found at the summit of the hillock whereas one was found to the east of the summit and another in the very southern part of the excavation, which at first sight revealed a dispersed distribution.

The other ceramic depositions (N=6) represent complete vessels found locked in the sterile subsoil (US 3000). In fact, the outline of a possible pit was hardly visible. We therefore presume these vessels were deposited in a tight-fitting, rapidly filled pit. Although we did not find any human bone (again) in the content of these vessels (cf. Section 7.2.2), we propose they may represent secondary urn burials or contain material related to specific rituals, i.e. varied objects related to funerary practices or rites de passage.

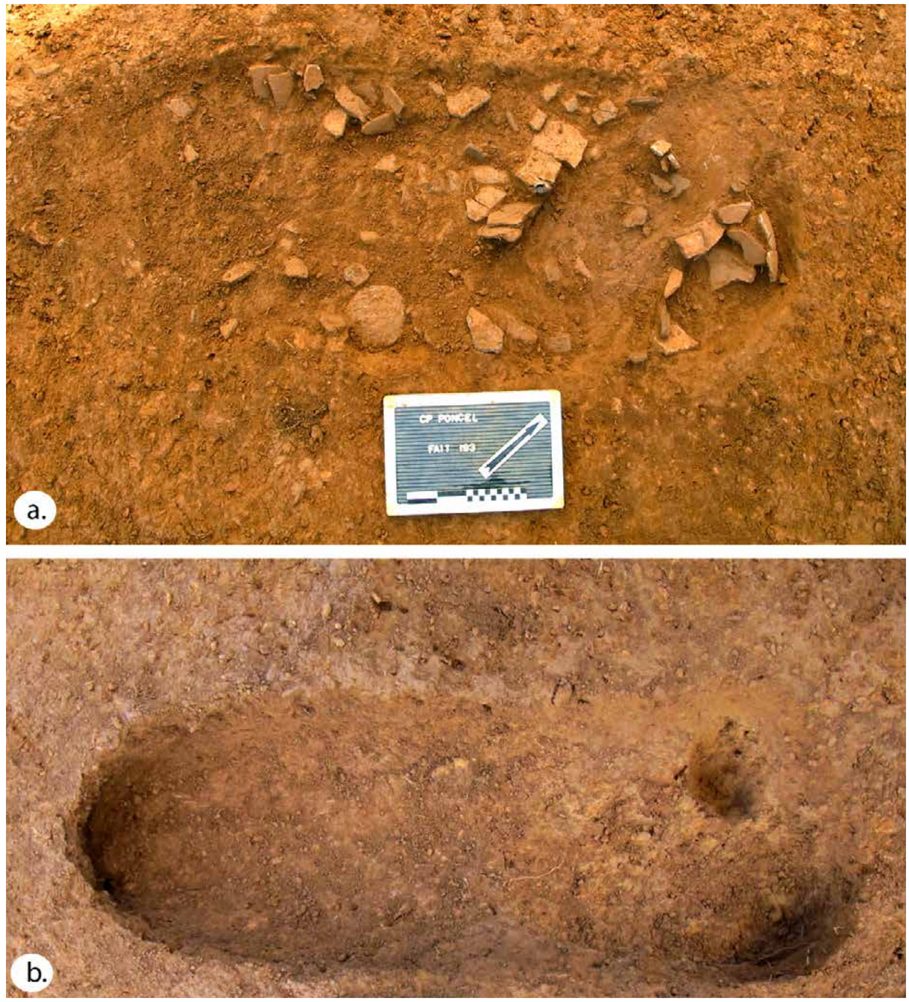

Figure 9.6. Zenith photographs of the elongated pit F 193 at the first and final levels of manual excavation.

It must be noted here that the Amazonian region is not very favourable with regard to the conservation of bone when confronted directly to the climate. As to the Guiana Shield, a small number of scientific references in literature concern inhumations in an archaeological context. If present in such a context, animal and human bones are often found in "protected" environments (e.g. caves, urns) (Goeldi 1900), or in a calcium-rich sediment (e.g. the shell ridges of coastal Suriname) (Tacoma et al. 1991).

In French Guiana, burial pits at habitation sites were often identified as oval, or more or less round, shallow pits measuring *c.*70 cm in diameter yielding bone fragments too small in order to identify their origin (cf. Section 5.4.1). However, test trenches at La Pointe Balaté yielded a primary inhumation burial leaving the fragmented "imprint" of an individual in a flexed or crouched position (van den Bel 2008b). Other indigenous inhumations were encountered at the historic Eva 2 site, including the imprints of human bodies in fœtal or flexed positions (cf. Section 11.3). Although we do not have any solid or tangible proof of human bodies in these more or less round pits, we consider them funerary pits because of analogies with similar pits in Suriname and the Caribbean.

Then again, do the supposed tombs at CPP differ from the oval shaped pits we came across previously? It must be added here that rectangular pits with ceramic depositions were found previously during the survey at the site of Katoury (Jérémie et al. 2002). However, at that time, they were not interpreted as possible burials, rather as dumps (Mickaël Mestre, personal communication 2013). More recently, two sites on Cayenne Island, i.e. Saint-Cyr (Delpech 2010a, 2011b) and Mombin II (Delpech 2011a, 2013), evidenced two concentrations of such elongated pits in which ceramic material was abundant (cf. Fig. 9.2). No human bone was encountered in these pits either. Whatever the case, these elongated or rectangular pits can apparently be seen as markers for LCA sites on Cayenne Island, knowing they do not contain skeletons or any (fragmented or bundled) human bones. Does this imply they were in fact empty or have been emptied, leaving only a mass of ceramics? A first step was taken by means of analysing soil samples taken from these pits in order to identify the presence of paleoparasites, associated with the human stomach (cf. Section 9.4.2).

As to the vessel depositions at habitation sites, small quantities of bone and/or calcinated bone were found at various sites in the interior (Vacher et al. 1998; Briand 2011), but the majority of these possible urns are "empty." Again, human bone is most often found in urn burials kept in caves and deposited in deep boot-shaped pits (P., *poços*) by the pre-Columbian population, as pointed out above (cf. Section 7.4). As suggested with regard to the Maracá urns, it has to be noted that it is difficult to comprehend if they represent either a final destination or temporarily recipients for bones (de Souza et al. 2001).

Concerning the simple pits we distinguish two types: (a) pits with an ovoid, or more ore less round, shape and a sink-shaped base, containing fragments of pottery and (b) pits with an ovoid or squarish shape (rounded corners), a flat base and straight wall profiles (e.g. F 66, F 92, F 117, F 159, F 165, F 200). The latter type has larger dimensions (*c.*80 x 100 cm) when compared to the sink shaped ones. Despite this distinction, the function of these pits remains rather mysterious, but they can be considered to be waste pits or else pits to stock objects or food in. Pits with straight vessel walls can be seen as pits with other functions. Soil analysis is needed in order to gain an insight into this matter.[221] We must outline two pits because of their large dimensions and contents here:

F 123 represents a very large sink shaped pit measuring 3.2 x 2.6 m at the excavation level. It reaches a maximum of 72 cm in depth. Three fills were identified, based on colour and texture. All contained fragments of charcoal, pottery and lithics. The large quantity of material suggests it may represent a waste area or dump. However, its size reflects a rather large treefall, which may indeed have served the inhabitants of this site as a dump.

221 According to Father Ahlbrinck (1931:309), the Kali'na used water-filled pits to soften the fruits of the ité palm or "murisi" (*Mauritia flexuosa*), in order to produce porridge of its pulp: 'Murisi epu-po = de vrucht van den Morisi. Ofschoon de Encycl[opédie] de vruchten niet eetbaar noemt, worden zij toch veel gegeten. De Karaïb graaft ter plaatse, waar hij water verwachten kan, een kleine kuil, werpt in den kuil de harde vruchten. 't In den kuil loopend water weekt de vruchten. Met bladeren dekt hij den kuil toe, opdat de zon de vruchten wederom niet verharde. Binnen drie dagen zijn zij zacht. Hij krabt ze los, vult er soms een geheele kalebas mede, roert er suiker in om en eet ze als een soort stijve pap.' Other fruits or tubers may have been treated in a similar way, but further archaeological research is needed to obtain reliable results.

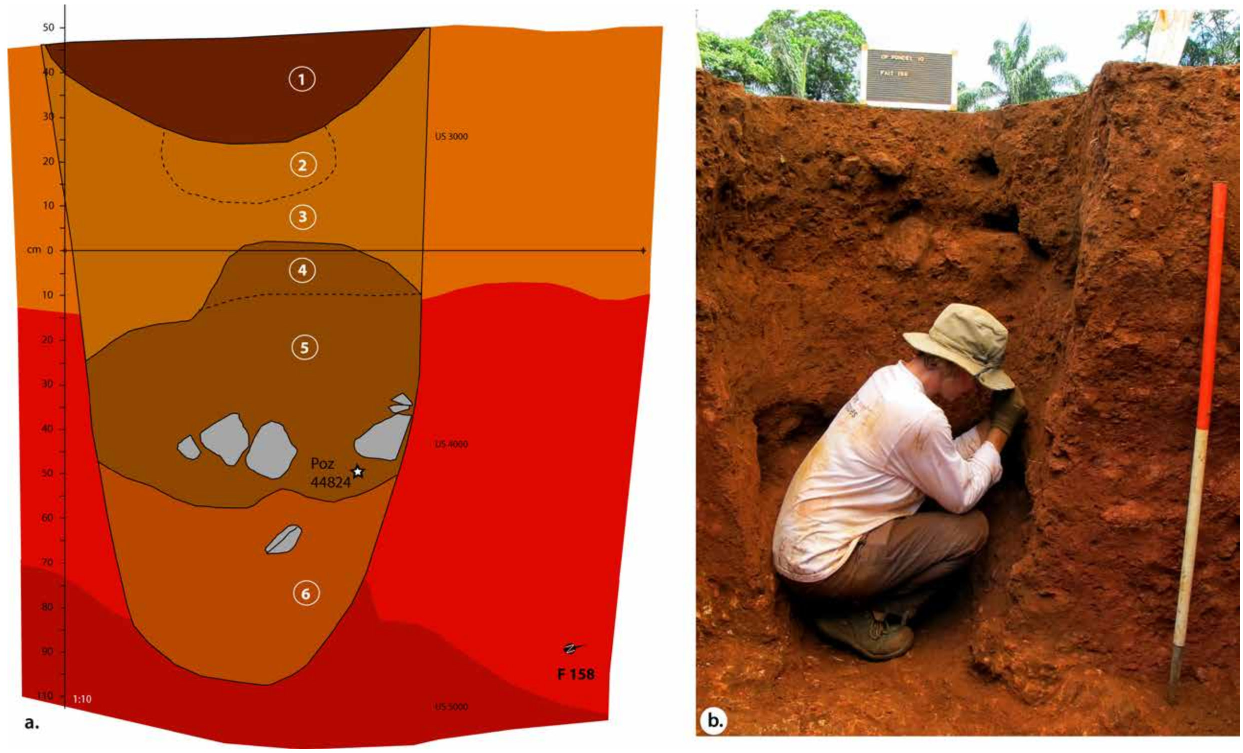

Figure 9.7. (a) A section drawing of the deep pit F 158 and (b) a photograph portraying the excavator in a rather suggestive position. The fill may be described as: (1) sandy silt, dark brown to black with charcoal, large blocs and large ceramic fragments, (2) pocket of loose sediment (roots?), (3) clayey silt with nodules, brownish orange, (4) empty pocket (root?), (5) clayey silt, reddish brown, loose texture with charcoal and (6) silty clay, red to light brown colour.

F 158 represents a very deep cone shaped pit with straight walls and a rounded base. At the excavation level its orifice measures 95 x 71 cm and reaches a depth of 148 cm (Fig. 9.7). If we estimate that *c*.50 cm of the black layer was removed by mechanical means, this pit must reach a depth of *c*.2 m!

At the first level of excavation, this feature contained numerous large pottery fragments which appeared to be related to various rocks, representing the final phase of this pit fill. When excavating the pit, its walls were easily followed by means of our trowels. We distinguished three more fills of which Layer 5 evidenced more large blocks. The bottom of the pit was dug into the bedrock (US 5000), ending in a cuvette. At that instance, we had never excavated a similar deep, cone shaped pit nor had we come across any scientific references in the other Guianas. However, the radiocarbon date (POZ-44824) taken from Layer 5 of 1635 ± 30 BP and the highly distinct ceramic material found only in this pit, may reveal an earlier occupation of this site (cf. Section 9.5 for ceramic analysis).

Generally speaking, this type of pit evokes similarities with funerary pits from eastern French Guiana and the Brazilian State of Amapá. However, the latter often feature lateral chambers and are dated to the LCA and often contain Late Aristé ware (Goeldi 1900; Cabral and Saldanha 2007; Mestre and Hildebrand 2011), ascribed to the Polychrome Tradition of the Lower Amazon.

The postholes

In total, 51 features were interpreted as postholes of which eight are possibly post holes. This ascription was based on the manual excavation of each feature, observing the hole's morphology, dimensions and fill. Although the postholes have varying sizes, the orifice (at the excavation level) is often round or slightly oval shaped with a diameter measuring between 17 and 49 cm for a depth of between 8 and 82 cm. In cross-section, we distinguished straight as well as boot shaped postholes. In the latter case, the orifice is most often wider than deep (e.g. F 7, F 102, F 118, F 183, F 197). The straight postholes can be distinguished in either flat-based or pointed examples.

The fill of these postholes is generally slightly sandier and darker than the surrounding subsoil. A small number also contained ceramics and rocks, i.e. F 84, F 100, F 133. The position of certain artefacts in these postholes has been interpreted as a voluntary position in order to obtain a specific angle when cornering the wooden post in the hole. As we have seen at Crique Sparouine, the spot with a darker sediment marks the position of the rotten post, but the post hole is often much larger. Several deeper postholes reached the reddish, much harder subsoil (US 4000) in which we were able to clearly observe a negative hole. It is presumed that a rather hard tool, e.g, a hardwood stick, has been utilised in order to obtain a hole in this type of sediment.

Regarding the number of postholes, the excavated surface and the estimated occupation of the site, the following remarkable traits can be observed. On the one hand, the majority of the postholes was found at the summit (*c*.800 m^2), probably representing one or two houses. However, where one would have expected many more postholes after 400 years of occupation, there are actually very few. On the other hand, the low number of postholes at this site compared to other hilltop sites may somehow reflect its specific function. Perhaps important to mention, solid constructions were never constructed or conceived here. Instead, we suppose there were only rather small "staked" houses, leaving hardly any traces, with only a small number of deeper postholes. Therefore, we could not reconstruct the plan of a pre-Columbian wooden dwelling. Momentarily, we are only able to designate the place a house must have stood, or house location, as explained in previous chapters. We know no archaeological reference plan at all in the Guianas, and if we wish to acquire an idea of LCA dwellings, we can only turn to the historic and modern analogies of Amerindian houses.

The ceramic concentrations and *in situ* objects

We came across four ceramic concentrations and three lithic objects *in situ*. These features were encountered either within layer US 2000 or at the limit with US 3000 when scraping of the dark layers. They represent residual finds and may have been abandoned at the surface. Of particular interest here is the stone bowl (F 96). This exceptional item in the Guianas was found at the northwestern slope of the hillock (Square P7) (cf. Figs. 9.5 and 9.31). The other lithic objects are large milling stones (e.g. F 26, F 76) (cf. Section 9.6.2).

The features 202 and 203

These two features were detected in the eastern profile wall of the excavation when recording the stratigraphic Section D. They represent two large basins or drainage gullies measuring 4 and 3 m wide and 65 and 42 cm deep respectively. Their dimensions and topographic position at the lateral sloping point evokes the idea that pluvial water may have eroded a talweg on this side of the hilltop. However, its flat base does not really support such a hypothesis. Further excavation is required in order to to comprehend the extension and nature of these features. Interestingly, the position of a possible inhumation grave (F 143) in the vicinity of these two large features may present a specific, mutual relationship with these features.

The anomalies

In total, 102 features were interpreted as non-anthropogenic or anomalies. They mainly consisted of root holes and treefalls. The latter were most often (still) visible at the surface and were topographed without a feature number. Their size ranges between 40 cm and 3 m and may reach a depth of 80 cm at the excavation level. They have an irregular outline. The fill of treefalls is most often very sandy and includes many nodules caused by means of erosion. Numerous (recent) tree falls contain archaeological material trapped in these natural pits: the treefalls have not been subjected to excavation by hand, but were scraped and cut by means of a small mechanical shovel.

Root holes may have a similar fill as post holes as well as similar dimensions. Indeed, in this case, a distinction between natural and anthropogenic is difficult to make. We can recall that root holes are more frequently pointed and the fill is (much) looser. Other holes, notably dug by armadillos or iguanas, represent highly confusing characteristics and may be mistaken for a root hole or even a posthole. Therefore it is important to excavate all features in order to present a more considered choice when the final ascription is established.

9.4.2 The paleoparasitological analysis

A paleoparasitological analysis was carried out in order to verify the presence of intestinal parasites in the elongated pits interpreted as pre-Columbian inhumation graves. Two sediment samples were taken from the elongated pit F 199: a rectangular-shaped pit measuring 160 x 45 cm containing a complete ceramic vessel and many pottery fragments (Fig. 9.8). Matthieu Bailly (University of Franche-Comté, France) carried out this analysis.

The samples were prepared according to the standard extraction protocol developed in Besançon (France). It consists of the following sequence: (a) rehydratation, (b) pounding and micro-screening in order to obtain parasite markers, i.e. eggs of parasitic worms, located in the gastrointestinal tract. The eggs are between 30 and 160 µm long and between 15 and 100 µm wide. The observations were carried out by means of a microscope.

Sadly, this analysis did not reveal any parasite markers at all. We only observed charcoal debris, several minerals and pollen. In this case, the absence of parasites may have the following explanations: (a) the absence of a body in the pit, (b) the absence of parasites in the stomach of the individual and (c) an inferior conservation of the eggs in this geological context, i.e. ferralitic soils , and (d) the presence of a secondary burial (e.g. bundle of bones).

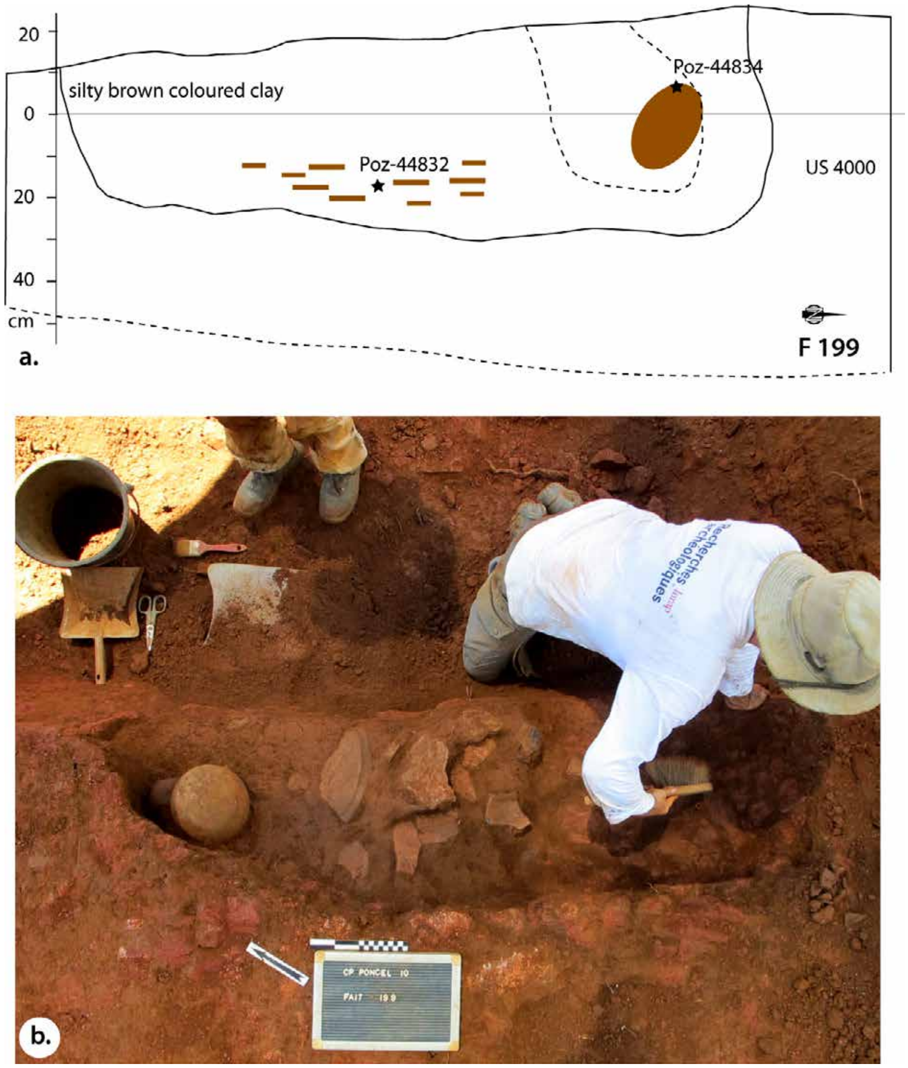

Figure 9.8. A section drawing of the elongated pit F 199 dug in the bedrock (US 4000) and a zenithal photograph of the manual excavation. Two radiocarbon datings were recorded as to this pit. The first was taken next to the complete vessel (EC 223) found upside-down (POZ-44834), the second from inside a sherd (EC 230) found at the bottom of the pit (POZ-44832).

However, this (test) study of two samples from a single pit does not suffice to understand the absence of eggs in this case. A similar analysis carried out on samples taken from highly similar features at the neighbouring Mombin II site on Cayenne Island, did not yield any positive results either (Delpech 2013). In this case, the sandy Pleistocene subsoil may account for the absence of eggs, too. Further analysis is required in order to establish if any eggs are present and if this method is worthwhile to be carried out in the Neotropics. Good results have been obtained with regard to drier regions in South America, such as northeastern Brazil or the coastal zones of Peru and Chili (Araújo et al. 2011).

9.4.3 The feature synthesis

The extensive excavation by mechanical means enabled the acquisition of a large overall view of this site in relatively little time. Despite the large size of excavated area, the boundaries of human occupation were not attained within the excavation perimeter. However, it may be clear now that the summital part of Morne Poncel yielded the majority of the anthropogenic features. Moreover, it had been more intensively occupied than other zones considering the feature distribution

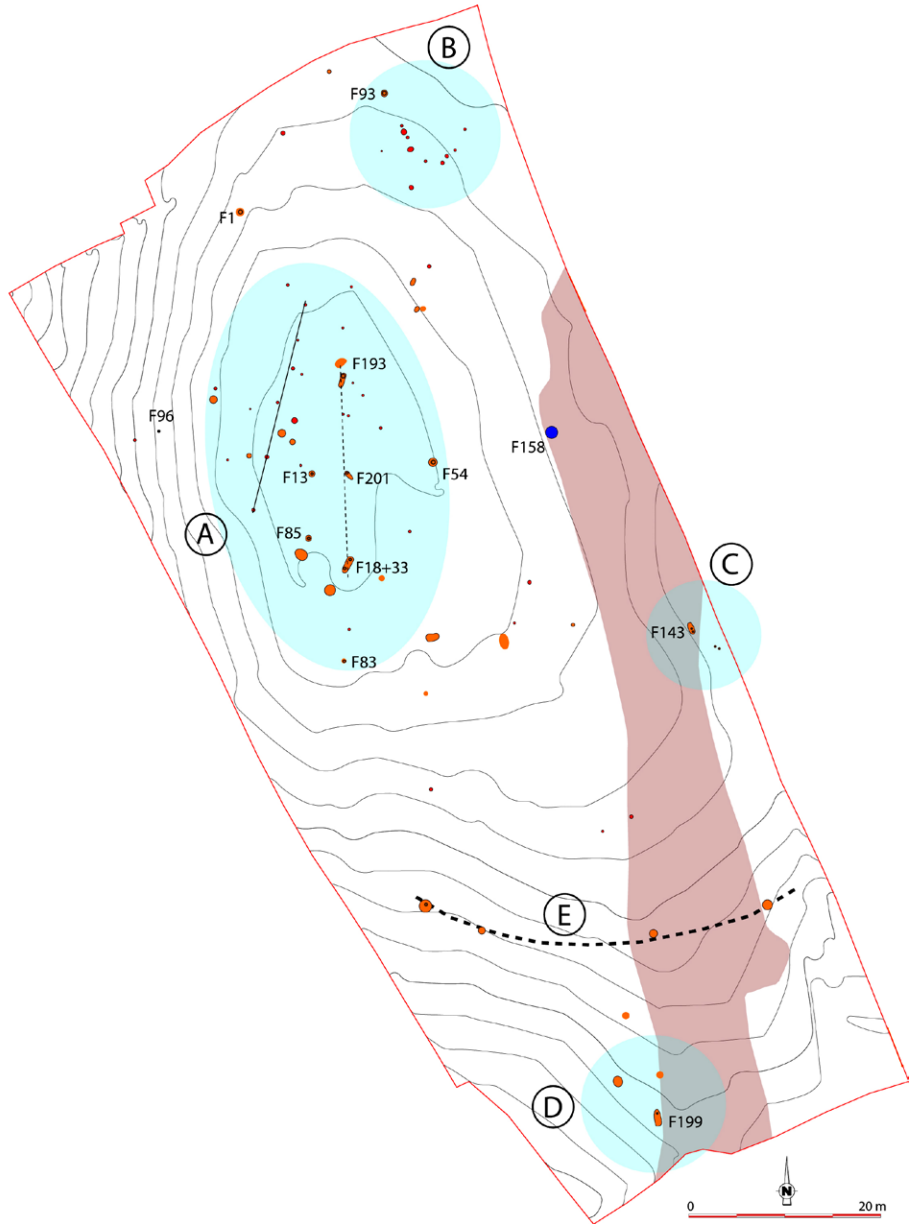

Figure 9.9. An overview of the hypothetical feature concentrations or Zones A-E with the important pit features indicated in yellow and the postholes which vary between 20 and 40 cm in depth and are presented in red.

within the excavation perimeter. As to this matter, we suppose that the latter zones are secondary areas, representing secondary habitats or activity areas. We distinguished five hypothetical features groups or Zones A-E, as presented here in detail (Fig. 9.9):

Zone A

This zone is the largest concentration of features and located upon the flat summit of the morne which measures *c.*45 x 25 m or *c.*800 m². The main elements of this area consist of approximately twenty postholes with a depth varying between 20 and 40 cm, two regular but rather deep pits (F 66 and F 178), a concentration of ceramics (F 2), three elongated inhumation pits (F 18+33, F 201, F 193) as well as four ceramic depositions (F 13, F 54, F 83, F 85). The ceramic deposition F 1 is situated outside this zone.

We may observe an alignment of six postholes, i.e. F 15, F 183, F 179-181, F 192, spaced every 5 m and situated at the western edge of the summit. Almost parallel to this alignment, following the summit's central axis, there is another evident alignment consisting of three elongated pits. The other features do not show any spatial connection. The small quantity of postholes for this "hot spot" is quite troublesome and may reflect a temporary installation or house location in spite of the possible inhumation graves. Notwithstanding this hypothesis, it may also reflect the fact we omitted numerous small and shallow features hidden in the dark layer.

Furthermore, if the postholes reflect a house location or, in this case, a house axis and if the elongated pits are indeed inhumation graves, we can evoke a possible relationship between pre-Columbian burial practices in or in the vicinity of houses. However, we do not know exactly if the inhabitants of Morne Poncel buried their dead in the houses or used the "old" village as a burial place, as pointed out with regard to SBE and Eva 2 (cf. Chapter 7 and 11). This is also hypothesized with regard to LCA sites located in the Lesser Antilles (van den Bel and Romon 2010).

Little can be gained here from radiocarbon dates in order to establish such chronological and functional distinctions as to postholes and burials within this zone as they cover the site's entire occupation period. Nevertheless, in sum, the alignment of the elongated burials at the hillock's highest point does indeed reflect a specifically designed spatial organisation, which has also been recorded at other sites on Cayenne Island, such as Saint-Cyr and Mombin II (see the dotted line in Fig. 9.9).

Zone B

This zone is situated in the northeastern corner of the excavation. In covers *c.*200 m² and consists of six post holes with a depth varying between 20 and 40 cm. Altogether they form a clear V shape accompanied by one ceramic deposition (F 93). This area slopes slightly and is considered to be a secondary habitation or activity area.

Zone C

This zone regroups the large features of F 202 and F 203. It represents the lateral depressions or head of the talweg, accompanied by an elongated pit (F 143) as well as two small ceramic depositions of which one is a very small, complete bowl (F 147). The lack of other features makes this part of the excavation difficult to comprehend. However, we imagine a sole event took place here, maybe an interment, knowing that this ensemble lies on the edge of our excavation.

Zone D

This zone is situated at the sloping, southern part of the excavation and distanced from the previous three zones. It consists of an elongated pit (F 199) and a squarish pit with straight vessel walls (F 200) interpreted as a fire place. The absence of other features in this area as well as the apparent isolated position also evokes a sole funerary event, as proposed for Zone C.

Table 9.3. The general ceramic count.

Total	Plain	Decorated	Weight (gr)	Mean weight
5979	5275	704	121,04	20.3 gr

Zone E

This zone represents four pits with straight walls, i.e. F 102, F 117, F 165, F 159. It is situated at the southern slope at approximately the same topographic altitude, forming a semi-circular belt, just below the hilltop. This position and its distance from the summit suggest another secondary area (or areas), probably linked to a certain activity related to this type of pits. Further microscopic and chemical analysis may point to a specific activity.

Compared to other excavations, this site includes a small number of features per 1000 m²: 30 for CPP, 200 for Crique Sparouine and 50 for PK 11, suggesting it represents a secondary habitation site or a special purpose site. On the one hand, the absence of important elements, such as hearth pits (with the exception of F 200) and wells (can fresh water can be found in Crique Cabassou?) confirms this idea. On the other hand, the presence of possible burials on site may suggest it is more important and has a more permanent character, despite the fact that the question concerning elongated pits remains technically unsolved.

9.5 The ceramic study

9.5.1 Introduction

The ceramic assemblage of CPP was hand-collected in exploring squares following the mechanical decapage (6 kg) as well as in features. In total, 5979 sherds were studied, weighing *c.*121 kg (Table 9.3) of which pit F 123 alone contained *c.*23 kg (20%). Fifty-one features without ceramic material were encountered (Annexe 7.2).[222]

The ceramic material collected from the dark layers (US 1000 and US 2000) plays a minor role in this ceramic analysis because its extraction was not continued all over the excavated area (cf. Section 9.1). In this case, the material collected from these squares only serves as an enrichment of the morphological and decoration modes at this site (N=17).[223] The remaining part of the constituent elements (EC) was collected from features (N=248), comprising a total of 23 archaeological vessel shapes.

Other compliance excavations have demonstrated that anthropogenic features yield the majority of the constituent elements, underscoring hereby the important value of this source of information. For example, the grid-collecting at CSL yielded only four archaeological vessel shapes, i.e. 13% of its total whereas the bulk was furnished by means of the features (cf. Section 5.5). Another example was taken from Katoury. Here, the majority (60%) of the ECs was obtained by means of digging features whereas the remainder (40%) was found in the buried surface level (Fr., *paléosol*) (Mestre et al. 2005:50). On the other hand, the residual

222 During the excavation we found but two fragments of imported ceramic ware (molasses pots) despite the close presence of the 17th century Bergrave pottery and Picard Plantation at the foot of the Morne Poncel. When the Poncel hillock was finally mined in early 2014, colonial material was detected on the northern foot of the morne (Eric Gassies, personal communication, 2014).

223 For more information on methodology, cf. Section 1.3.2.

			Mode	N
Mineral	**1**	sand / quartz	11	39
		sand + mica	12	16
		sand + mica + black minerals	13	5
		finely pounded mica	15	4
Vegetal	**2**	charcoal	21	29
Mixed	**3**	minerals and charcoal	31	138
Grog	**4**	pounded sherds	41	34

Table 9.4. The distribution of temper modes.

material plays a significant role in the way in which and where to recognize any dump areas or house locations, as we have seen with regard to Crique Sparouine (cf. Fig. 6.15).

The disparity between decorated and plain sherds as to this assemblage is rather high: 11.7% of the ceramic total is decorated whereas 40% of the ECs is decorated. Therefore, as to this catergory, we can attribute a degree of importance to its decorated ware. This high level of decorated ceramics (more than 10%), is confirmed by means of other LCA ceramic assemblages with regard to Cayenne, such as at Katoury: 13% (Mestre et al. 2005:47) and PK 11: 12% (cf. Table 8.3).

The state of conservation of the ceramic material is mediocre. This is probably related to the tropical climate and soils because the artefacts found in deeper contexts (e.g. pits, postholes) are often in a better state of conservation than those found in the archaeological layer. In the majority of the cases, the common finishing techniques (e.g. polishing, smoothing, burnishing) and (fragile) white-on-red painting, has disappeared from the exterior vessel walls making it difficult to observe these techniques.

The only manufacturing technique observed here is the coiling technique characterised by means of numerous sherds with U and/or N shaped joints. However, the studied griddles consist of two superimposed clay slabs pressed together, often with an additional, usually thinner, coil around its edge in order to form a rim.

The paste's non-plastic elements were recorded with the naked eye in order to classify its composition. Now and again it was difficult to determine their origins –the fragment had been broken several times– in order to obtain an average count of the various particles, notably when distinguishing pounded potsherd, charcoal fragments and sand quantities. This heterogeneity is probably guided by means of a rather quick malaxation of the temper ingredients into the raw material as seen with PK 11 (cf. Section 8.5.1). Again, it is presumed that the latter raw clay was often badly checked for impurities. Perhaps the pottery manufacturing process was generally speaking uncareful. This can be linked to a certain degree of mass production.

Four temper modes were observed for the ECs: (a) mineral (N=64), (b) vegetal (N=29), (c) mixed (N=138) and (d) grog temper (N=34). Mode (c) is the most popular (Table 9.4). It has to be noted here that the mixed temper mode (No. 31) contains all sorts of non-plastics (voluntary or not), such as charcoal, quartz-sand, ashes, grog, mica, etc. The grog temper mode (No. 41) contains pounded potsherds, but may also include charcoal and sand, albeit to a much lesser extent.

The microscopic analysis of the PK 11 temper modes indicates not only that observation with the naked eye is insufficient (cf. Section 8.5.3) but also that grog is probably the most important ingredient of these LCA assemblages, thus revealing a mixed temper with a significant level of grog. Paste modes Nos. 3 and 4 are much alike. As to griddles, the grog temper is higly recognisable. Now and again they contain large sherd fragments measuring up to 2 cm. Apparently, griddles received a less pounded sherd fraction and perhaps only remainders of a pounding session (after screening).

Aside from the mixed mode, the mineral temper is the most popular (24%). The others are minoritary modes. As to the sand-tempered ceramics, we must note here that the examples of pottery found in pit F 158 clearly distinguish themselves from the rest of the assemblage. The reason for this is that their very sandy temper is emphasized by means of the stylistically dissimilar decoration modes as well as an early first millennium radiocarbon date. Two other features, i.e. F 1 and F 200, also have an exclusive sand temper. However, the radiocarbon result for the latter feature is found within the common LCA range.

The macroscopic analysis regarding firing, observed at the newly made fracture of the sherd, revealed four principal colours: (a) red all over, (b) orange to brown all over, (c) dark grey core with lighter coloured walls and (d) dark grey or black all over. The latter two firing modes correspond to a reducing environment (72%).[224] The second corresponds to an oxidising environment (5%) and the remaining mode to a combination of both firing techniques (23%). The reducing firing technique in combination with a mixed temper represents the most popular combination on site (48%).

9.5.2 The constituent elements

The characteristic elements contain 265 individuals of which 23 are reconstructed archaeological vessels (Annexe 7.2.3). We recorded 168 rim fragments, 103 base fragments and 17 griddle fragments. It is recalled here that 106 specimens of the consituent register are decorated (40%), consisting of 84 rims, eight bases and 14 complete vessel shapes.

The rims

The rim diversity allows us to create eight modal series (SM I-VIII) (Table 9.5). We further distinguished three subseries as to rims with rectilinear, concave or convex profiles, as to open forms (SM I-VI). The presence of a carination and/or a specific labial treatment, i.e. an inclination or flexation or the rim, created a further subdivision regarding this series: subseries SM III a-d. In total, seven subseries were established of which four feature keels and three have inflexed lips.

The rim diameter and paste was also recorded with regard to these elements. Seven elements were not attributed to any of the above-mentioned series due to a lack of any morphological repetition. They constituted their own series, namely SM VIII, with unique rims. Another specific series includes the necks or bottles (SM VII) of which the orifice diameter measures less than 10 cm, representing the principal element of discrimination. Remarkably, however, the ECs of the two latter series (N=13) are all decorated, with the exception of one specimen from pit F 123.

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224 This reducing firing corresponds to no. 9 and 10 after Rye (1981:116, Fig. 104).

SM		N	Shape	Profile	Lips / Keels
I		15	O	Rectilinear	
II	a	16	O	Concave	
	b	14	O	Concave	Keeled towards the exterior
III	a	22	O	Convex	
	b	17	O	Convex	Inflected lip towards the exterior
	c	19	O	Convex	Inclined lip towards the interior
	d	4	O	Convex	Keeled towards the exterior
IV		4	R	Rectilinear	
V		6	R	Concave	
VI	a	20	R	Convex	
	b	4	R	Convex	Inflected lip towards the extrior
	c	9	R	Convex	Keeled towards the interior
	d	5	R	Convex	Keeled towards the exterior
VII		6	R	Collar	Bottle
VIII		7	x	Unique	
		168			

Table 9.5. The rim series SM I-VIII.

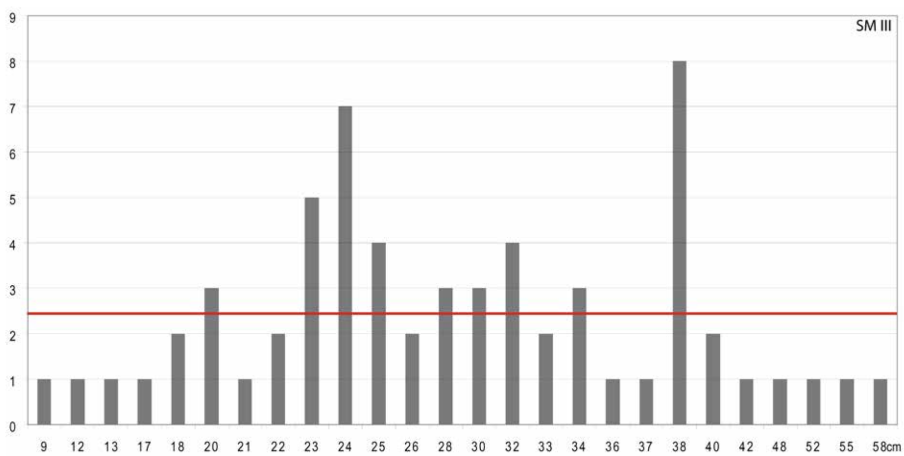


Figure 9.10. The diameter frequency of SM III.

In sum, the CPP series are represented by means of: (a) open vessels (SM I-III), (b) restricted vessels (SM IV-VI), (c) necked vessels (SM VII) and (d) unique vessels (SM VIII). Series (a) represents the most frequent vessel shape (66%). SM I-IV and SM VI represent the most relevant series of which SM III occurs most frequently (37%). The others are considered minoritary series. The unique elements (SM VIII) represent 4% of the EC total and are thus of little value.

SM III This series represent the convex rims and contains 62 elements. It is the most frequent type of rim profile (37%) and thus a common element to this site. This series has been subdivided into rim profiles with: (a) an inflection at the interior of the vessel wall, (b) the lip inclining towards the interior and (c) keels (Table 9.5). The lip shapes are most often flattenend (52%), rounded (26%) or pointed (21%). The wall thickness varies between 4 and 11 mm (with a mean of 7 mm) and the diameters of the orifice range between 9 and 58 cm.[225]

225 From 30 cm on, the diameter was measured with a 2 cm interval.

When the sum of the mean diameter value (29.5 cm) and its frequency number (N=2.4) is taken as a discriminant element regarding the vessel orifices, peaks can be distinguished at 24, 32, and 38 cm (Fig. 9.10). They may reflect different orifices regarding the same vessel shape. However, we cannot attribute an orifice size to each subseries.

The preponderance of mixed pastes is notable with this series (66%). The others represent a minority. As already stated in the previous section, the omnipresence of a mixed temper combined with a reduced firing technique is striking and emphasises the homogeneity of the ceramic production on site.

As much as 50% this series is decorated. Here, red (43%) the most frequent colour, followed by incised decorations, such as vertical or oblique crossed incisions (Fr., *treilles*), small wavy-lines, and a single incised line around the rim (28%) as well as indentations upon the lip (18%). As to the red colouring, the majority was applied to the exterior wall (N=8). Only two elements were painted white on both the inside and outside wall. Incisions were applied exclusively to the exterior of the vessels. We observed only one combination of red paint and incisions (EC 150). The SM IIIc series is associated with the application of small modelled clay balls or lugs (e.g. single or double nubbins) or small indented clay strips applied several centimeters below the rim.

In sum, the convex rims of this series represents a steady production with the following features: (a) a rim profile with an inflexed lip towards the exterior and/or an inclined lip towards the interior, (b) three dominant diameters with regard to the orifices, (c) the application of various types of incisions to the exterior wall, (d) red colourings on the interior and (e) indentations on the lip.

SM VI This modal series is less important than the previous one (23%). It too represents convex rim profiles, but with regard to restricted vessel shapes. The labial treatment and presence of a keel makes it possible to create subseries (SM VIa-d) of which the convex rims with inflected lips towards the exterior (11%) and the carinated examples (36%) are most noteworthy (Table 9.5). However, the simple convex rim remains the most frequent (53%). Most rims have flattened lips (52%), followed by pointed (29%) and rounded rims (19%).

The wall thickness varies between 4 and 11 mm (with a mean value of 6.3 mm). The diameters range from 8 to 55 cm. When the sum of the mean diameter (≈25 cm) and its frequency number (N=1.7) is taken as a discriminant element, one observes the following groups of diameters measuring: (a) between 12 and 20 cm, (b) *c*.24 cm and (c) between 34 and 38 cm (Fig. 9.11). These peaks reflect frequent diameters regarding these series, but do not correspond to a specific subseries, with the exception perhaps of SM VId which appears to favour the smaller vessels. As before, we note the preponderance of mixed pastes (45%) and a reducing firing technique.

As much as 76% of this series was decorated. The majority hereof shows incisions on the exterior wall (90%), followed by three indented ECs and two with a red colouring on the interior. The incisions modes vary but 51% consists of oblique examples, followed by wavy-lines (23%). Seven items have modelled appliqués (e.g. nubbins, lugs). We may note here that oblique incisions are mainly found in the SM VIa subseries. The small wavy-lines can be attributed to the SM VIb and SM VIc subseries. It is highly possible that SM VIa and SM VIc are ovoid or boat shaped vessels.

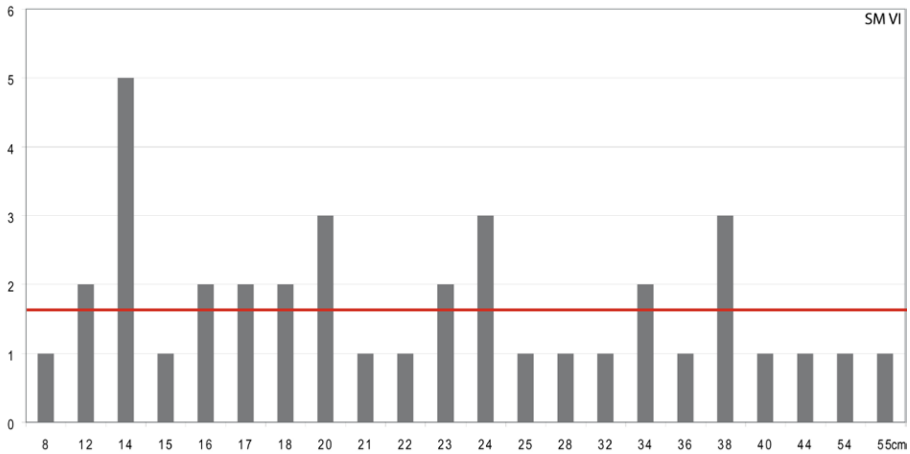


Figure 9.11. The diameter frequency of SM VI.

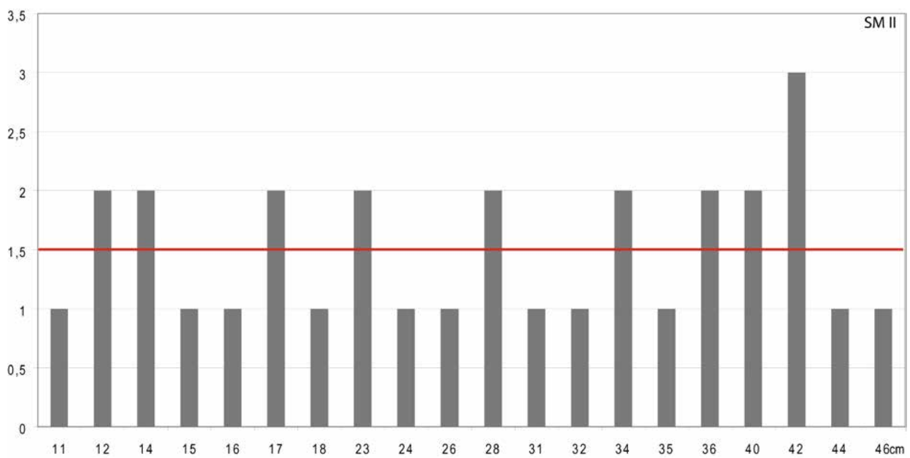


Figure 9.12. The diameter frequency of SM II.

SM II The third most frequent series are the concave rims (18%) of open vessels. The presence of carination and the flaring of the rim towards the exterior enabled us to distinguish another subseries (SM IIb). Up to 43% of the lips are rounded, 33% is flattened, and the rest (24%) is pointed (Table 9.5).

The wall thickness varies between 5 and 12 mm (mean value: 7.7 mm). The diameters measure between 11 and 46 cm. When the sum of the mean diameter (28 cm) and its frequency (N=1.5) is taken as a characteristic element, we observe that large orifices measuring *c.*42 cm predominate this concave series, suggesting a preference for large vessel-shapes (Fig. 9.12). Twenty-two items were found inside (waste) pits. Again we see a reponderance (66%) for mixed pastes as well as for the reducing firing technique (77%).

Only 37%, or 11 indiviuals, of this series is decorated almost exclusively on the outside of the recipient. These decorations consist of six rims with indentations on the lip, six rims with a red colouring and five rims with various types of incisions. The combination of a red band and crossed oblique incisions applied to the neck of SM IIa (N=2) represents a highly recognisable decorative aspect of this series. It also features a complete vessel, found in a small pit or post hole, i.e. EC 154 of F 93, with a regularly indented lip as well as a complex geometric white-on-red dessign added to the interior wall (Fig. 9.13).

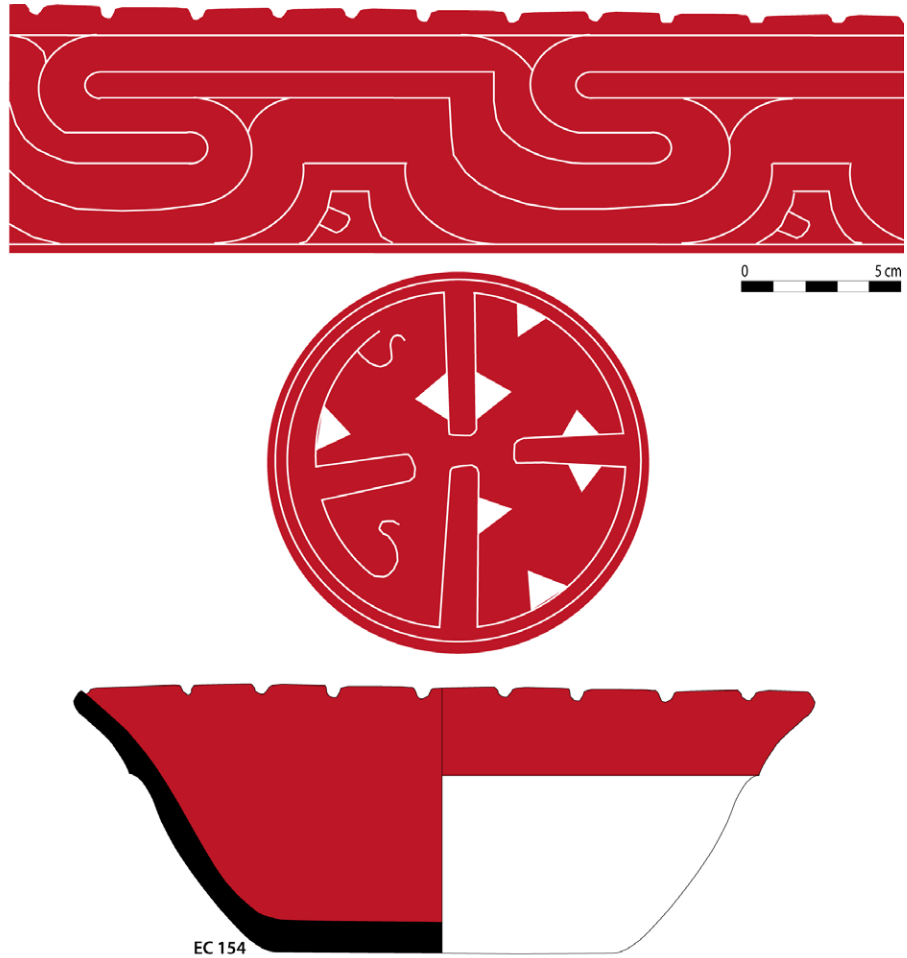


Figure 9.13. EC 154 was found in pit F 93 and has complex white-on-red designs on its interior wall and base. The subdivision of the base into four elements forms a cross that may represent an (abstract) reflection of the cosmovision of the inhabitants at CPP.

SM I The fourth modal series consists of rectilinear rims of open vessels (9%). As much as *c.* 60% of the lips are flattened and 33% is rounded. The wall thickness varies between 6 and 9 mm (mean value: 7.4 mm). The diameters vary between 22 and 56 cm. When the mean value (35 cm) and its frequency number (N=1.4) is taken as a characteristic element, we observe that larger orifices of *c.*38 cm are the most common to this series (Fig. 9.14). Once again we see a concentration of mixed pastes (87%) and reducing firing (80%) with regard to this series. Only four individuals were decorated (27%).

SM VII This series catches the eye because of its restricted orifice measuring less than 10 cm. This morphology reflects the neck of a bottle and consists of six individuals, i.e. 3.6% of the total EC population. The wall thickness varies between 4 and 6 mm. All elements were fired according to the reducing firing technique and have either a vegetal or a grog temper. Moreover, they are decorated with incisions and red banded colouring, with the exception of one merely incised specimen. Two elements also have small lugs. It is possible that this series may have keels at the base of the necks. If so, they may be ascribed to the SM VId subseries. This series is very homogeneous and represents us with a a characteristic ware.

SM V The concave rim profiles of this restricted minority series comprise six individuals. The wall thickness varies between 6 and 10 mm. The diameters measure *c.*24 cm. Three ECs include incisions applied to the interior wall.

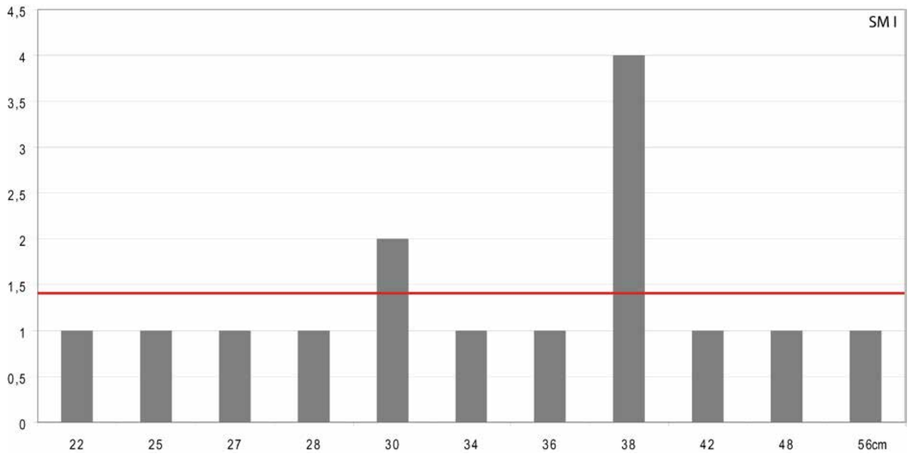


Figure 9.14. The diameter frequency of SM I.

SM IV This modal series comprises rectilinear profiles of restricted vessels (N=4). The wall thickness varies between 7 and 8 mm. The lip shapes are either flattenend or rounded. The diameters vary between 22 and 24 cm. All items are decorated: white-on-red paint/slip and incisions are applied to the exterior walls. As for SM VI, this small series is homogeneous. It has a recognisable morphology and decoration mode rendering it a marker for this assemblage.

SM VIII The SM VIII series (N=7) represent all other rims which do not correspond with the above-mentioned descriptions.

The bases

The register of base fragments comprises 103 individuals, i.e. 39% of the total EC count. Their bases were classified in the following modal series established according to their morphology: (a) flat bases (SM 1), (b) dimpled bases (SM 2) and (c) pedestaled ones (SM 3) as well as two undetermined specimens. The flat bases occur more frequently (55%) than dimpled ones (36%) (Table 9.6). Seven pedestal bases represent a small series (7%) and are very recognisable.

Flat bases (SM 1) The flat bases (N=57) were subdivided according to their profile: (a) rectilinear (SM 1.1, 26%), (b) concave (SM 1.2, 22%), (c) convex (SM 1.3, 26%) and (d) appendicular (SM 1.4, 26%).

The base thickness varies between 4 and 16 cm. However, we note that thinner bases can be ascribed to the SM 1.2 and SM 1.3 subseries whereas the thicker ones can be found in the SM 1.4 subseries. Of the largest examples, the diameters vary between 5 and 25 cm. They were predominantly recorded for the SM 1.4 subseries. In general, we can observe that (a) thinner bases also have smaller diameters and (b) appendicular bases are slightly dominated by means of the larger diameters. Only two elements were decorated (3%), both with a red colour. A quick scan informs us that the repartition of pastes between bases and rims differ (Table 9.7). We noted a predominance of sand temper with regard to bases over rims –in spite of our small sample. This difference is often visible to the naked eye thanks to the consequent quantities of large quartz elements in the base paste (Fig. 9.15). The abundance of quartz/sand for bases is often associated with obtaining better performances out of cooking pots. The reason for this is that this temper conducts heat in a superior manner (Skibo and Schiffer 1995:83).

SM		N	Base	Profil
1	1	15	flat	rectilinear
	2	12	flat	concave
	3	15	flat	convex
	4	15	flat	appendicular
2	1	10	dimpled	rectilinear
	2	4	dimpled	concave
	3	15	dimpled	convex
	4	8	dimpled	appendicular
3		7	pedestalled	
0		2	undetermined	
		103		

Table 9.6. The base series SM 1-3.

Dimpled bases (SM 2) The second most relevant series, i.e. the dimples bases (N=37), were subdivided accordingly: rectilinear (SM 2.1, 27%), concave (SM 2.2, 11%), convex (SM 2.3, 41%) and appendicular (SM 2.4, 21%). Within this series the convex profile occurs by far the most frequently. The base thickness varies between 5 and 18 mm. The diameters vary between 6 and 16 cm. As with flat bases, the thinner ones are associated with smaller diameters. Three elements (8%) were decorated of which two were painted red-on-white and was one incised.

Paste no.	Bases	Rims
11	27	18
12	10	6
13	3	2
15	3	1
21	15	18
31	37	106
41	8	17
	103	**168**

Table 9.7. The repartition of the pastes between rims and bases (cf. Table 9.4 for the paste numbers).

Pedestal bases (SM 3) This series is minoritary (N=7), but features a remarkable morphology. Two items were painted red on the inside (cf. Fig. 9.23a). A third element included a spiral painted on the interior with a darkish brown slip.

The griddles

This category is represented by means of seventeen individuals i.e. 6.4% of the EC total. The griddles were subdivided according to the rim shape: either simple, non-modified (SM A) or modified with a modelled rim (SM B-E). The latter has varied shapes: pointed, rounded, straight or appendicular (Table 9.8).

Figure 9.15. A base fragment EC 103 showing a large quantity of coarse mineral material.

The poor quality and relatively small quantity of the small griddle fragments is remarkable, but provides us with little information. On the other hand, the dissimilar finishing modes, thicknesses (measuring between 14 and 24 mm) and the diameters (between 38 and 64 cm) include a large variety of griddles which is difficult to apprehend due to the small quantities. The temper consists almost exclusively of (coarse) pounded sherds, now and again larger than 2 cm! Indeed, its presence of 6% for the entire constituent register is rather low, when compared with other LCA sites, such as Katoury with 13% (Mestre et al. 2005:53) or PK 11 (cf. Section 8.5.3). We may further note that 65% of the griddles were found in the waste pits F 123 and F 151, located at the central part of the site (Zone A).

We may also refer here to a clay ball (F 150) and two pedestalled or footed objects (EC 61 and EC 229). The latter two fragments may represent ceramic stools and/or tablets as found during the survey in Trench 8 (Hildebrand 2004, Plate 4), at Thémire (Rostain 1994a, Fig. 112.8) and Saint-Agathe (Rostain 1994a: Fig. 141.1-5; Samuelian 2009:73).[226]

SM	N	
A	5	simple (straight)
B	5	modified, pointed
C	3	modified, rounded
D	1	modified, straight
E	3	modified, appendicular
	17	

Table 9.8. The griddle series SM A-E.

9.5.3 The decoration modes

The decorated fragments (N=704) represent 11.8% of the total amount of ceramics found at this site. The modes of decorations consist of incisions (51%) and painted ware (38%) (Figs. 9.23-7).

The incisions

The incised decoration mode (N=358) is, with the exception of two specimens, applied on the outside of the recipient. As to this study as well as to PK 11, we distinguished several modes (Modes 1-5): (1) parallel vertical and/or oblique incisions, (2) vertical crossed incisions (Fr., *treilles*), (3) alternated (Fr., *chevrons*), (4) complex incised motifs often in a zone or cartouche and (5) wavy-lines. Modes 1 and 2 together represent the majority of the incised ware, i.e. 83%. This corresponds with *c.*30% of the rentire decorated register (Annexe 7.2.4).

It was difficult to recognise the varied types of decoration as the fragments were on occasion too small to distinguish Modes 1 or 2 or even Mode 3: oblique or vertical, crossed or alternating, etc. In fact, we recorded simple oblique as well as oblique crossed incisions on one and the same vessel! In either case, we chose to lump the modes of decoration into five modes in order to escape a multitude of coapplied modes which would be also too time-consuming with regard to the present study. However, it may of course be relevant to other analyses (cf. Section 8.5.5 for an introduction to Cayenne incised ware).

As to CPP, incised pottery is mainly represented by means of *treilles* applied on the exterior upper part of the recipient, as with PK 11, notably for: SM IIa, SM IIIa, SM IIIc, SM VIa-d and SM VII. Convex profiles such as SM IIIc and SM VIa resemble the afore-mentioned recipients which include *treilles* applied to the upper part of the vessel. The keeled series, i.e. SM VIc-d and the concave series,

226 The present author also noticed incised stool fragments with regard to the Bigiston site on the Lower Maroni River when visiting the depot of *Zorg en Hoop* (Paramaribo) in August 2012 (see note 173). See also Arie Boomert's early contribution in Dutch on the LCA ceramic incised sniffing tablets found in Suriname (1975) and Rostain's inventory of LCA incised tablets in French Guiana (1994a, Fig. 141).

i.e. SM V and SM IIa, display *treilles* right below the lip. Together with the bottle necks (SM VII) we can thus distinguish four modals series with *treilles*.

In addition to these, rather basic, incisions we observed more complex motifs, applied solely to the exterior of the recipient, such as the wavy-lines mainly recorded with regard to SM VI. The latter motif represents *c.*7% of the entire incised repertoire. Furthermore, we note 35 specimens with spaced indentations on the lip (mainly SM IIa and SM IIIa) and six specimens with punctations. We can mention here four rims with a single or double series of thin incisions (fingernails?) on the inside of a flattened or concave lip. They were only found in pit F 158. Two similar rim sherds were found in Trench 8 during the survey, situated in the vicinity of F 158 (Hildebrand 2004, Plate 3).

The slipped/painted ware

The slipped/painted ware comprises 269 elements, i.e. 37% of the total decorated register. As much as 60% had received colouring on the exterior wall and 37% on the inside. The remaining number is bifacial.

The colours "Red" is represented by means of the following chromas 7.5R 4/6-8 (e.g. EC 23, EC 73, EC 66 (Fig. 9.22e), EC 148 (Fig. 9.28f), EC 191) and "Yellowish red" by 2.5 YR 6/8 (EC 52, EC 150), 2.5 YR 5/6 (EC 100) and 5YR 6/8 (EC 155). We may also refer here to one (rare) fragment with duotone red: the application of geometric painted dark red on a lighter red surface, i.e. EC 209 (Fig. 9.20).

The application of white-on-red, black and white painting remains rather rare, representing less than 10% of the total coloured ware. However, 17 fragments were recorded with a red band, applied around the neck (SM VII) or concave rims (SM IIa) of which the majority features *treilles*, incisons and/or wavy-lines with small nubbins. We may recall here that the specific association of red colouring and incisions has been pointed out with regard to Katoury (Mestre et al. 2005:63).

The modelling

This type of decoration (N=48) only represents 6.8% of the decorated total. It consists of small appliqués: nubbins, thin clay strips or lugs, and several (biomorphic) *adornos* (Fig. 9.27), all applied to the upper part of the recipient, near the orifice (lip) or keel/shoulder, notably for the series: SM IIIc-d, SM VIa-d and SM VII.

We also recorded a rare modelled (human?) face. It was found in the superior fill of pit F 158 and may have been part of a statuette or vessel. It features a round headdress (hat?) and has very large hanging ears or earlobes. Handles are rarely encountered (N=2).

9.5.4 The synthesis of the ceramic assemblage

The CPP typology

This typology is based on 265 elements including 23 complete vessel shapes as well as the associated modes of decoration. The morphological rim register of 168 elements declines firstly with regard to the series SM III followed by SM

VI and SM II, representing 77% of the rim total. The other series are clearly less important, but provide characteristic elements concerning their specific morphology and decorative aspects, such as the bottle necks (SM VII).

As to these series and with PK 11 (cf. Section 8.5.6), we observed a number of frequent morphological traits and decorative modes. Three similar forms were identified:

Form A The most significant recipients are most certainly the open or slightly restricted spheric bowls with parallel oblique or vertical incisions. They are most often crossed or in *treilles* and applied at the upper part of the bowl, i.e. SM IIIc and SM Via. They are also grouped as Form A when compared with PK 11 (Fig. 8.17).

Form B Another important combination is the pot with concave rims and a red coloured band often combined with *treilles* or alternated incisons on the neck or shoulder, i.e. SM II and SM V which resemble Form B of PK 11.

Form C A less relevant series consisting of bottles (SM VII). However, the morphology and combination of decoration modes, a red coloured band and *treilles* or alternated incisions, resemble Form C of PK 11.

Aside from the above three similar forms when comparted to PK 11, we identified two new forms with regard to CPP:

Form D A restricted vessel or pot with a thickening or groove just below the lip, i.e. SM IV (Fig. 9.16). These vessels were also found at Sainte-Agathe (Samuelian 2009:61, Plate 1n–p) and at MCA/Vieux Chemin (Coutet 2009:282, Type 4).

Form E Small keeled (ovoid) bowls with incisions, notably wavy-lines or *treilles*, often accompanied by nubbins and lugs, i.e. SM VIc. These bowls were also found at Saint-Cyr (Delpech 2010:27) and at Pointe Gravier (Turenne 1974:29, Fig. 1).

The following remarks must now be made regarding the ceramic series of CPP:

a. The other subseries, i.e. SM I, SM IIb and SM IIIb, play an important role, but did not show a clear association with a certain type of decoration. Nevertheless, we must underscore the fact that these series are popular vessel shapes, too, and a part of the CPP assemblage (Figs. 9.17-20).

b. It is relevant to emphasize the homogeneity of the modal series and the proposed forms in combination with the dominating reducing firing technique and mixed/grog temper. The reason for this is that it may reflect a distinct production with its own style from a technological, morphological and decorative point of view. In fact, the simultaneous ceramic study of both LCA assemblages found on Cayenne Island share a very similar register. This allows us to draw a stylistic comparison and forward a ceramic sequence with regard to Cayenne Island and its surroundings.

c. As to the excavated surface: we did not reach the limits of the occupation, but did manage to delimit various zones and, more importantly, define the principal zone at the summit of the hillock (Zone A). As to this central

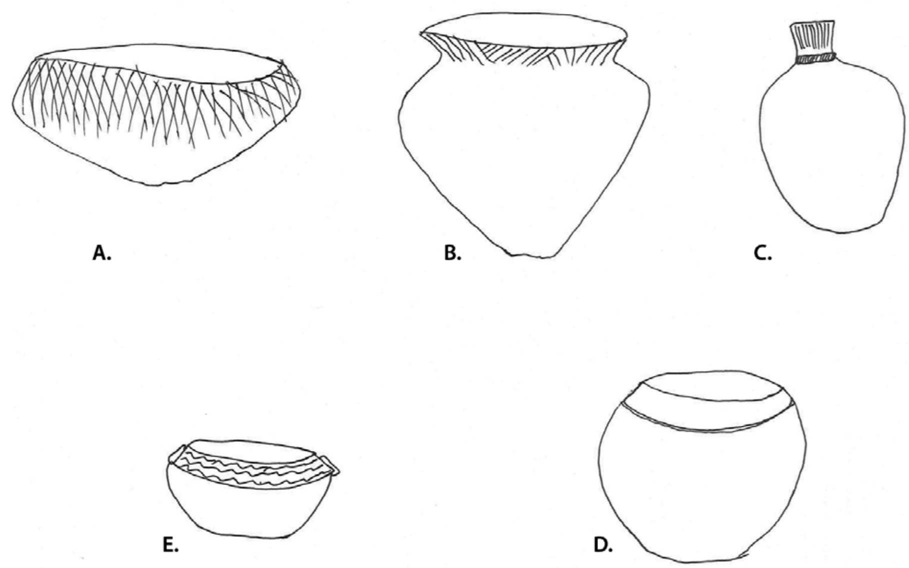


Figure 9.16. The sketches of the recurrent CPP Forms A-E (not to scale).

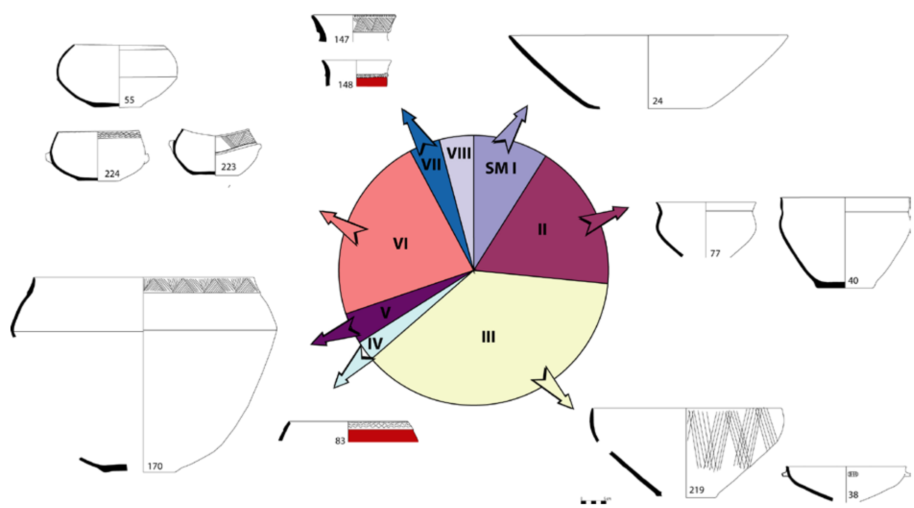


Figure 9.17. An overview of most relevant vessel shapes per modal series.

area (measuring *c.*1000 m²), we excavated the entire surface (at two levels). This may imply we studied *grosso modo* all the ceramics found here, thus representing a closed ensemble.

d. With the exception of the material found in pit F 158, all ceramics were dated between AD 900 and 1400. They can thus be safely attributed to the LCA. The site was not reoccupied during the Historic Age by any other Amerindian groups. Only at the start of the 18th century did this hilltop serve as a plantation.

e. Rare decoration modes found at CPP were also recorded for other sites on Cayenne Island. For example, (almost) identical vessels such as EC 55 and EC 157 (Fig. 9.25e) were discovered during a survey at Chennebras or the Saint-Cyr site (Delpech 2010a:26, Fig. 12).

Recipients found in F 54 (EC 43) and F 85 (EC 56) of Zone A and the elements found in F 102 (Zone E) have yielded open keeled vessels with white and red slips, respectively (see Fig. 9.18). Complex geometric designs in monochrome red,

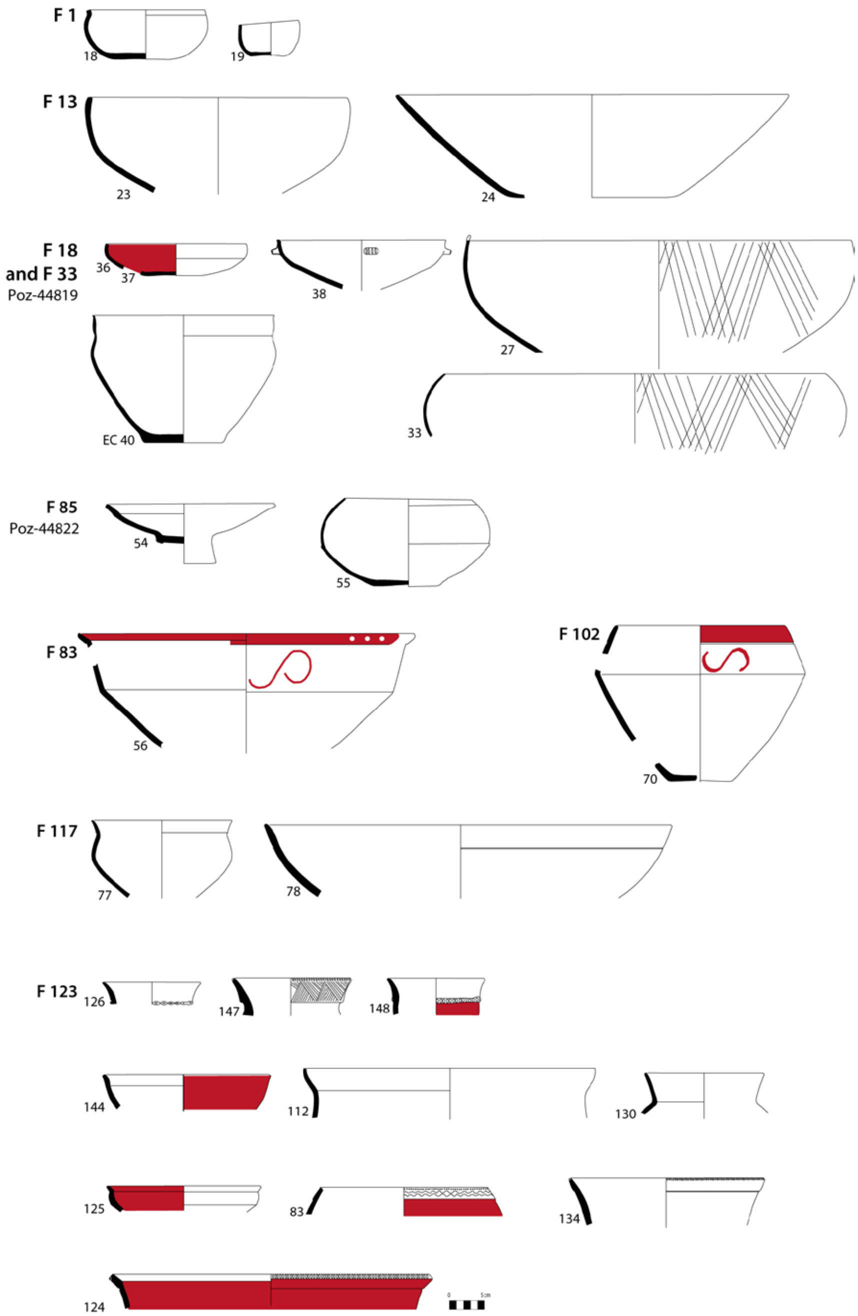


Figure 9.18. The ceramics per feature (1).

white and white-on-red are very common to Cayenne and adjacent areas, to wit: (a) Vieux Chemin (Cazelles 2002, Plate 5; van den Bel 2007b:91, 94), (b) Mini Circuit Automobile (Coutet 2009:288, Type X), (c) Sainte-Agathe (Samuelian 2009: 66, Plate 1a-h, Plate 6a-b) and (d) Mont Grand-Matoury (Hildebrand 2000, Fig. 25).

On their exterior walls we can observe continuous volutes (F 102, EC 70; Fig. 9.18), series of punctations (F 83, EC 56; Fig. 9.18), but also triangles materialised by means of small punctations (F 123, EC 124; Fig. 9.18). We can mention several sherds with visible or apparent coils (Fig. 9.23f) thought to represent a characteristic element of the entire western littoral of French Guiana

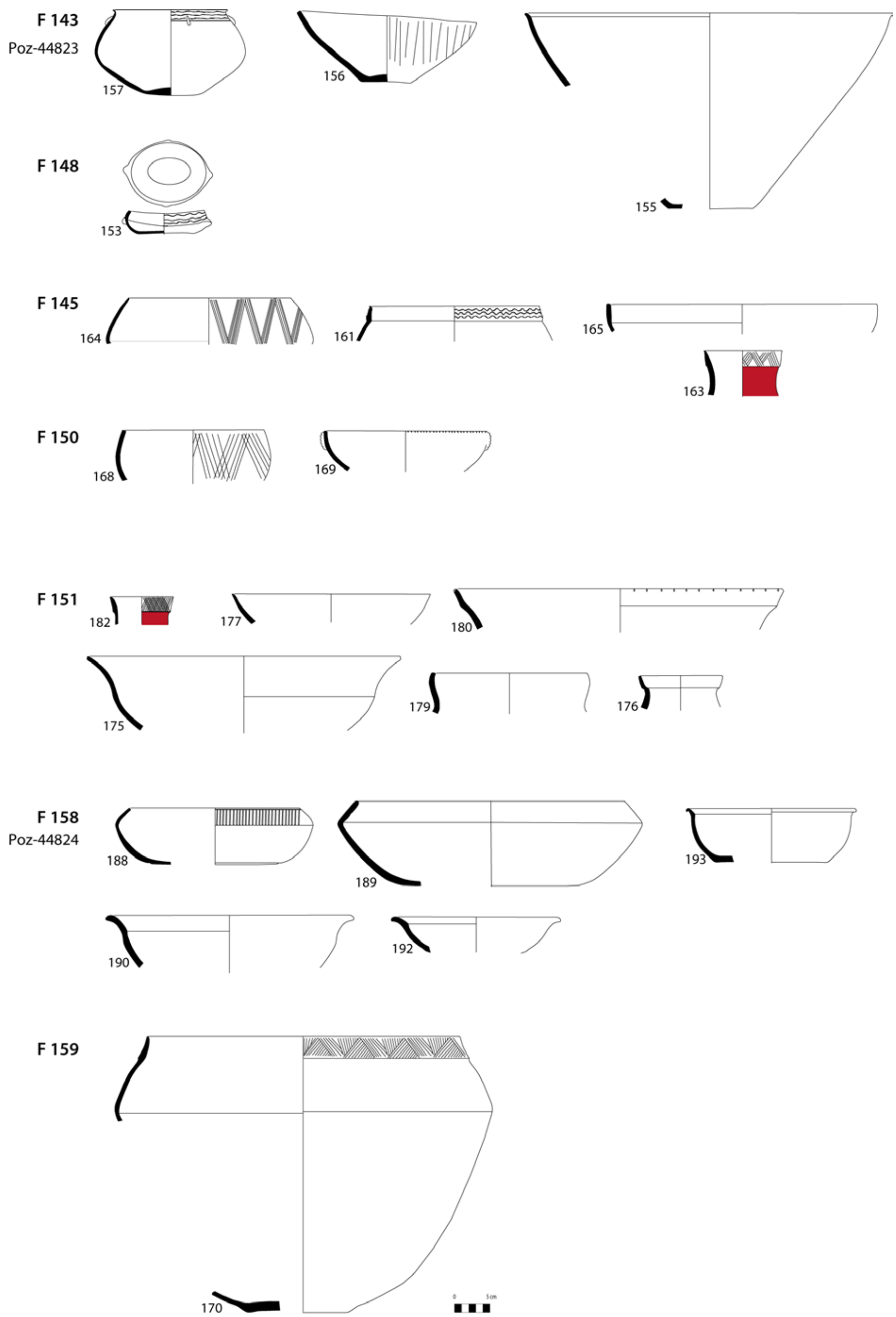


Figure 9.19. The ceramics per feature (2).

and eastern Suriname (Boomert 1993:202; Rostain et al. 2008:37–38; Mestre et al. 2005, Fig. 3; Samuelian 2009:64, Plate 4h; Hildebrand 2000, Fig. 51.8).

When considering the radiocarbon dates of various features (e.g. F 18+33, F 85, F 143, F 165, F 199, F 200) and positioning them next to the ECs found in these features, a chronological sequence is obtained (Fig. 9.21). However, it is appears difficult to propose any detailed developments concerning the pottery production at CPP due to the great morphological diversity (Figs. 9.22-3) and the coarse results of the radiocarbon dates. Nonetheless, a general outline can be suggested here: red paint and incisions remain the constant factors revealing

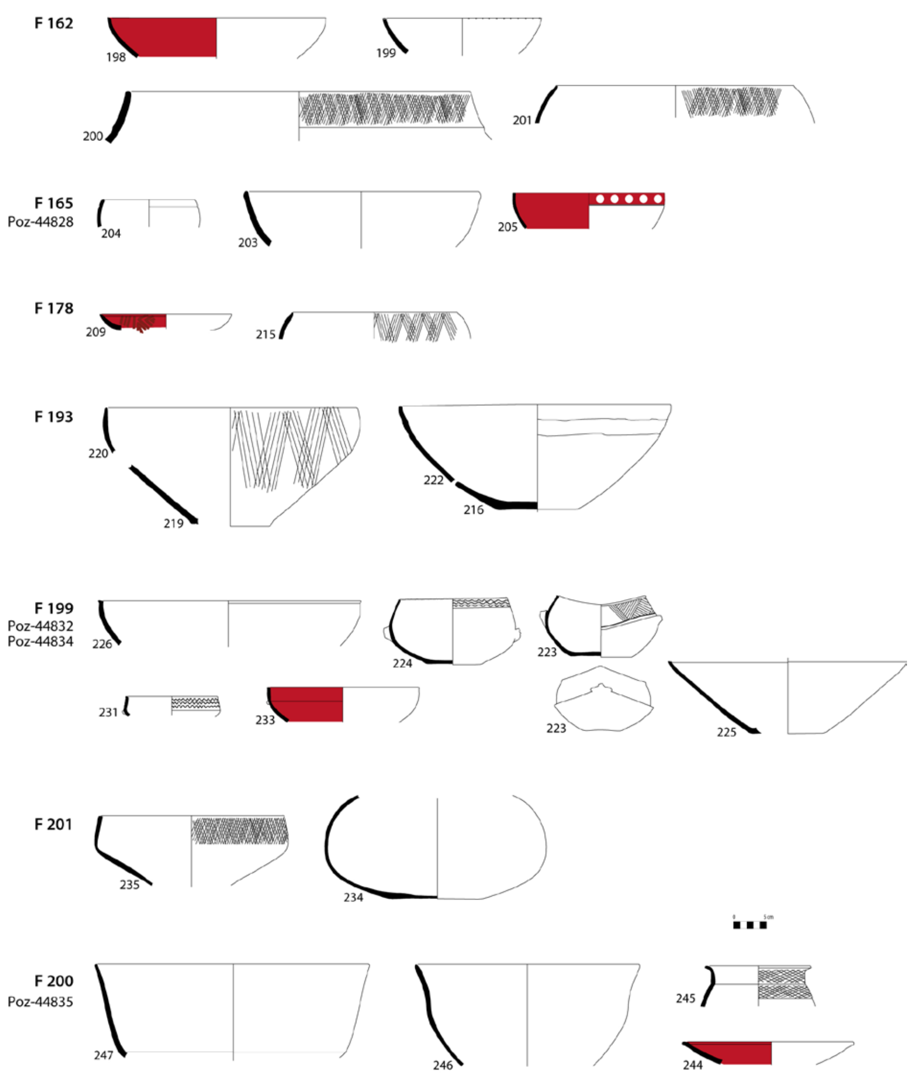


Figure 9.20. The ceramics per feature (3).

a continuous production of notably smaller bowls with red paint, presumably service ware.

We may also point out that bifacial, red painted bowls with white dots, i.e. white-on-red painting (Fig. 9.24c) as well as red-on-white painting (EC 56, EC 70) and red-on-white painting (Fig. 9.24f) related to the ceramic depostitions of the pits F 13, F 54, F 85 and F 200, have the tendency to be ascribed to the second half or the latest part of this occupation, approximately to the 14th century (cf. Fig. 9.24). This also applies to pits F 165 and F 102 of Zone E. From this point of view, shouldered pots with slightly flaring rims, i.e. EC 77, EC 247, represent innovative vessel shapes.

The cultural affiliation

Firstly, it is said that the ceramic assemblages of PK 11 and CPP are very similar when considering the vessel shapes, paste and decoration modes. This is confirmed by means of the radiocarbon dates from both sites. It is very likely that ceramics from these two sites were produced by potters sharing the same pottery tradition, quite possible the same culture, and thus sharing the same style.

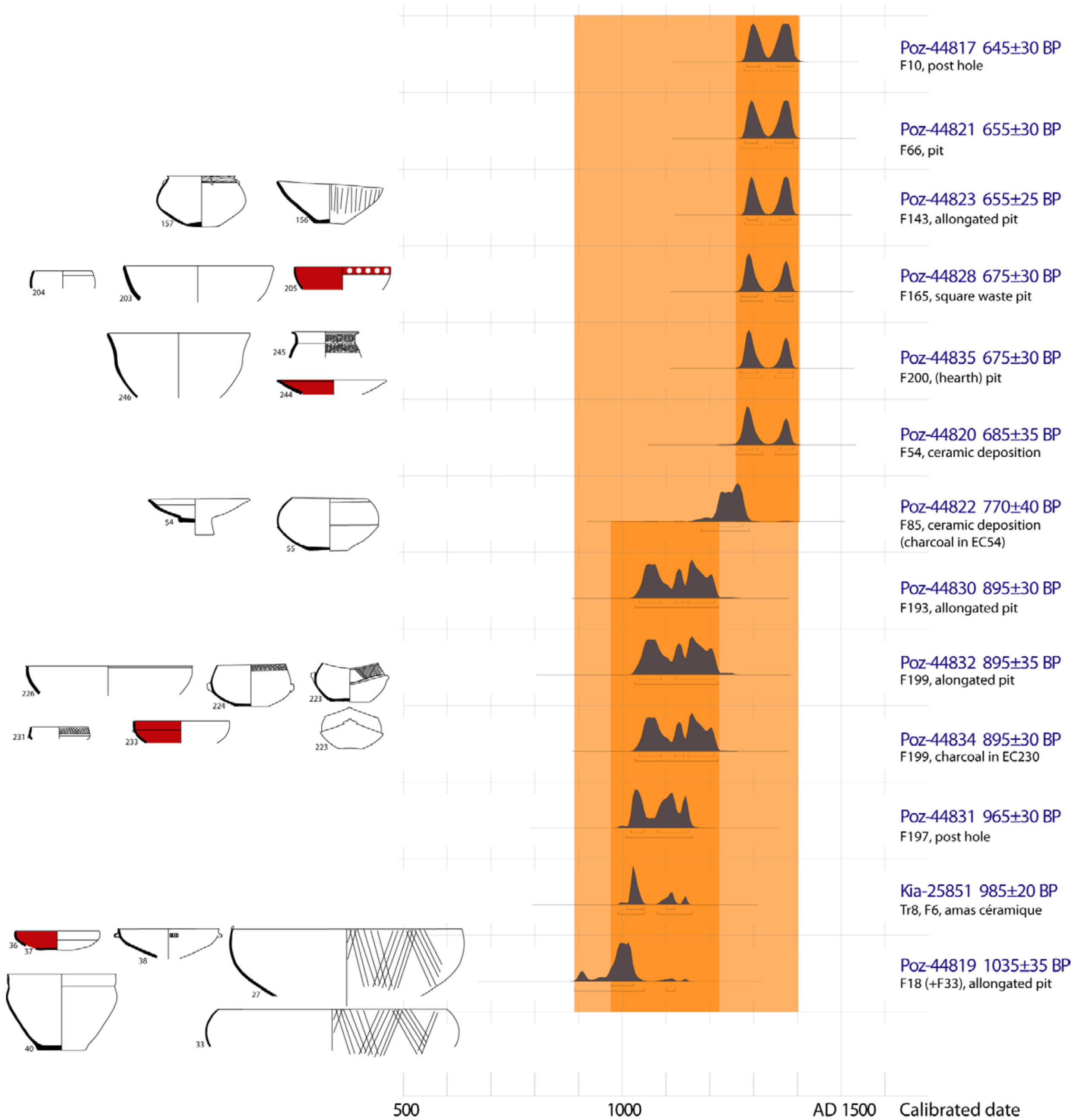


Figure 9.21. The ceramic chrono-typology of CPP. The atmospheric data are from Reimer et al. (2004), calibrated at 2σ with OxCalv3.10 Bronk Ramsey (2005).

Both CPP and PK 11 assemblages can be ascribed to either: (a) *Cayenne peint*, based on the grog temper or (b) *Mahury incisé* when considering the predominance of incised ware over painted ware. In both cases, the assemblages would eventually be ascribed to the Thémire ceramic complex, as Rostain (1994a, 2008) defined. However, as pointed out for PK 11 (cf. Section 8.5.6), this conclusion is not satisfying. The reason for this is that the existing types do not reflect the presented analysis nor do they fit the protohistoric radiocarbon dates regarding Thémire. After 20 years and many excavations, the Thémire complex has become obsolete and needs to be revised as well as adjusted. The types of Thémire are now too heterogeneous and, more importantly, the existing radiocarbon dates concerning

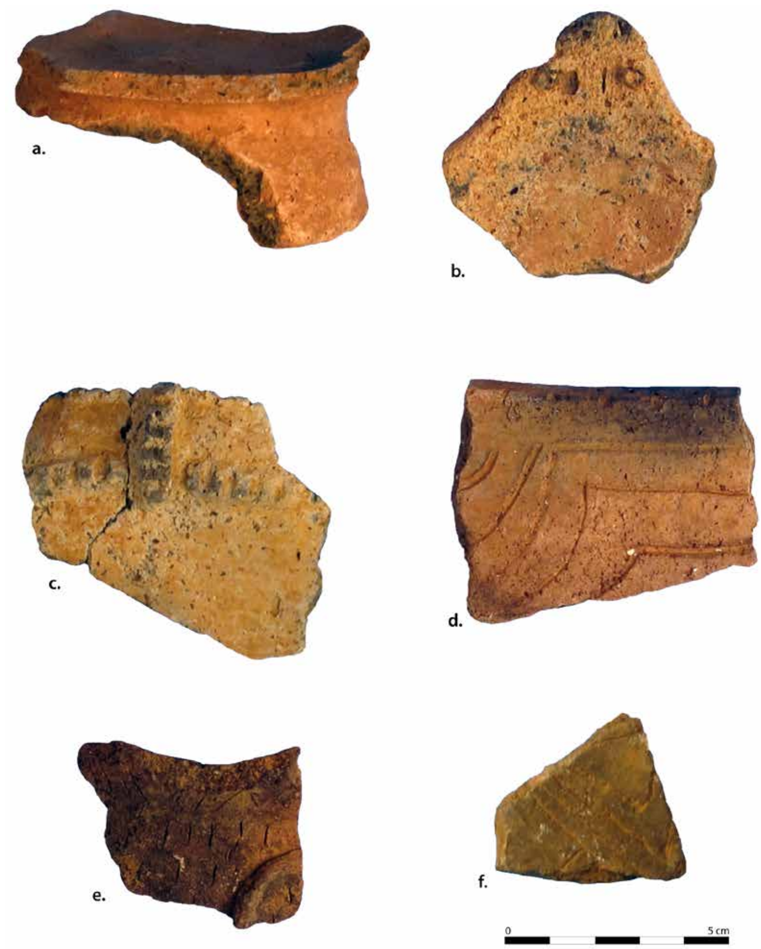


Figure 9.22. Decorated rim fragments (1): (a) EC 100, a pedestalled base, (b) EC 149, a lug fragment, (c) EC 169, indented clay strips, (d) EC 183, complex parallel incisions, (e) F 66, nail indentations and appliqué and (f) F 157, complex vertical incisions.

Thémire are too recent (Rostain 2013:122) when compared with the dates obtained for PK 11 and CPP.

The numerous radiocarbon dates and forms regarding PK 11 as well as CPP suggest an important occupation with regard to Cayenne Island dated between *c.*AD 900 and 1400. This is materialised by means of one pottery style whereas the dated Thémire complex is indeed more recent than the sites presented here. From this point of view, it would be appropriate to propose two successive ceramic complexes for the LCA of Cayenne Island: Early and Late Thémire. Looking into the original Thémire type descriptions (cf. Section 8.5.5), one certainly recognizes elements of both hypothesised Early and Late Thémire ceramic complexes which should be untangled in order to specify the two complexes as such. It is evident that Rostain was getting a grip on the LCA of Cayenne, but that he also lacked numerous radiocarbon dates and further ceramic material collected from a solid archaeological context, i.e. extensive and/or programmed excavations, in order to provide a more detailed description of Thémire. This, however, he affirmed in a later publication (Rostain 1994b:10, note 2), as mentioned in the previous chapter.

In sum, the PK 11 and CPP ceramic series share temper, decoration and, to some extent, vessel shapes with various Thémire types. However, they rather reflect an earlier dated phase of Thémire. This presumably rendered descriptions

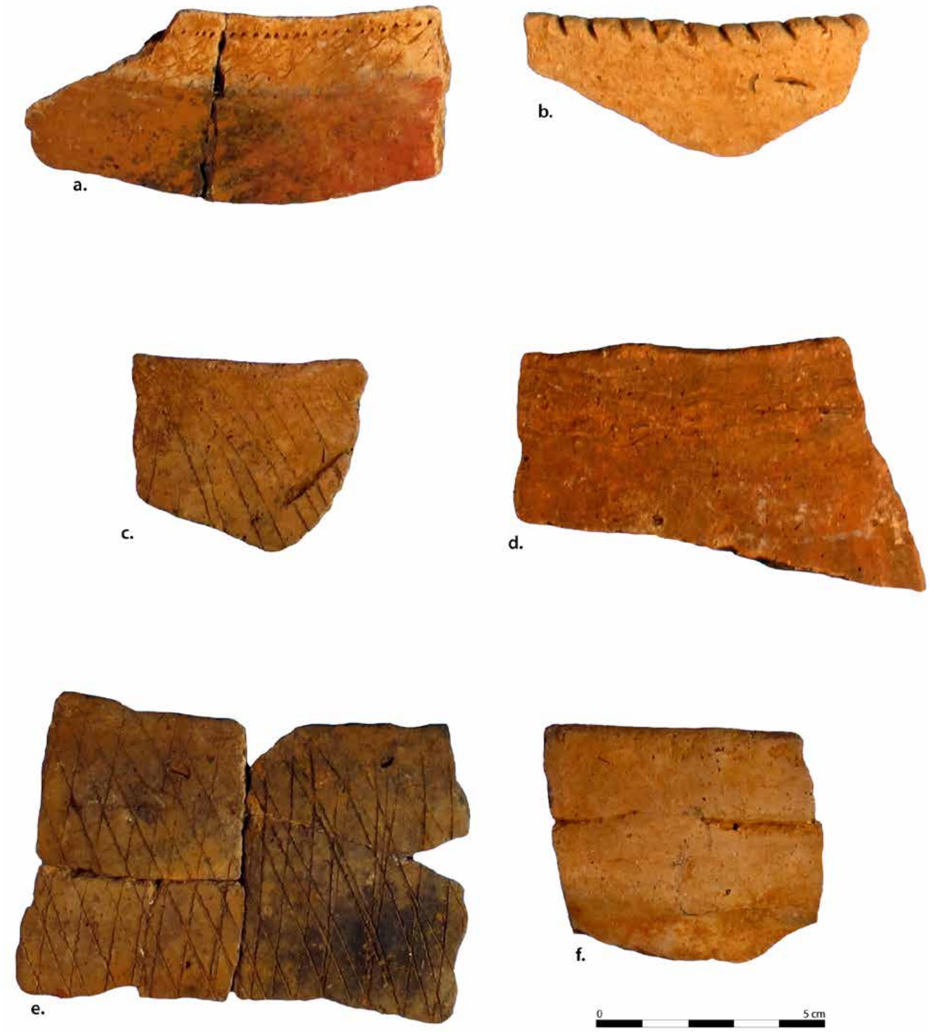


Figure 3.23. Various decorated rim fragments (2): (a) EC 83, a red slip and nail indentations with punctations below the lip, (b) EC 85, nail indentations on the lip, (c) EC 129, oblique parallel incisions, (d) EC 161, wavy-lines, (e) EC 201, obliques incisions, or treilles, and (f) EC 50, visible coils.

of the most important Thémire types too amalgamous and not sufficiently specific in order to confront incoming material.

The type *Cayenne peint* is predominantly defined by means of red and white-on-red painting of which the latter often represents beautiful geometric complex designs (Rostain 1994a, Fig. 113). If white-on-red painting represents a more recent phase, as hypothesised above with regard to CPP, than this type of bichrome painted or Late Thémire ware, as Rostain (2013:122–123) defined, is probably derived from Polychrome influences hailing from the east. For example, when we observe the remarkable white-on-red motifs of the bowl found in F 93 (cf. Fig. 9.13), they do indeed resemble the geometric designs encountered at the sites of eastern French Guiana, called *Enfer polychrome* (Rostain 1994a, Fig. 93.1) or even in the State of Amapá (Goeldi 1900, Plate 3.1 and 3.8). However, its morphology reminds us also of the type *Chaton fantastique* (Rostain 1994a, Fig. 104.18), which is better known as Koriabo and often found in Thémire complexes according to Rostain (1994a:447) who defined it as the type *Melkior kwep*, but only as a 'temporary type.'

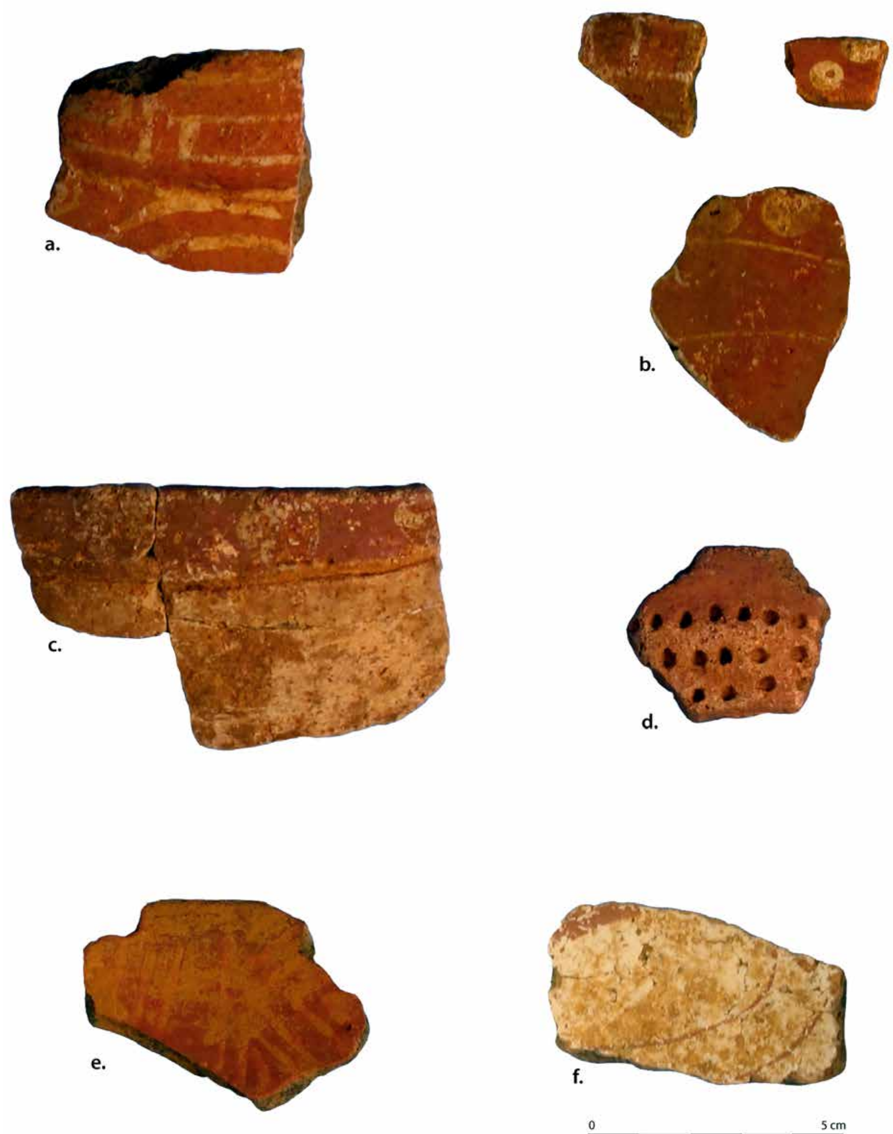


Figure 9.24. Examples of slipped/painted ware: (a) EC 62, a white-on-red complex design on collar, (b) white-on-red fragments (two with white dots on red), (c) EC 205,a rim with red band with white dots with a linear incision, (d) Square H 2, a rim with red band and punctations, (e) EC 209, negative red slipped fragment and (f) F 157, red-on-white painted fragment.

Furthermore, EC 112 and EC 117 of the subseries SM IIb (see Fig. 9.22) share similarities with other painted Koriabo vessel shapes (Boomert 1986:34, Fig. 14.2; Rostain 1994a, Fig. 104.14). These specimens may have been the result of exchange within a larger network or represent a later occupation at the site. Other sites which can be attributed to the latest phase of the LCA are probably Montabo-Sud, Montagne à Colin, Bois Diable/La Sablière and Sainte-Agathe of which the three latter sites have indeed yielded radiocarbon dates belonging to this phase: after *c.*AD 1300/1400 (Wack 1990b; Barone-Visigali and Prost 1991; Rostain 1994a; Casagrande 2005; Migeon 2007, 2012; Coutet 2009; Samuelian 2009).[227]

In any case, the beautiful, geometric duotone (on occasion polychrome) designs of F 93 and F 83 evoke connections with the mouth of the Lower Amazon River (Boomert 2004; Rostain 2008b:293). Notably, archaeological sites on the

227 The present author also came across a polychrome anthropomorphic face related to the LCA Bigiston site on the Lower Maroni River when visiting the depot of *Zorg en Hoop* (Paramaribo) in August 2012.

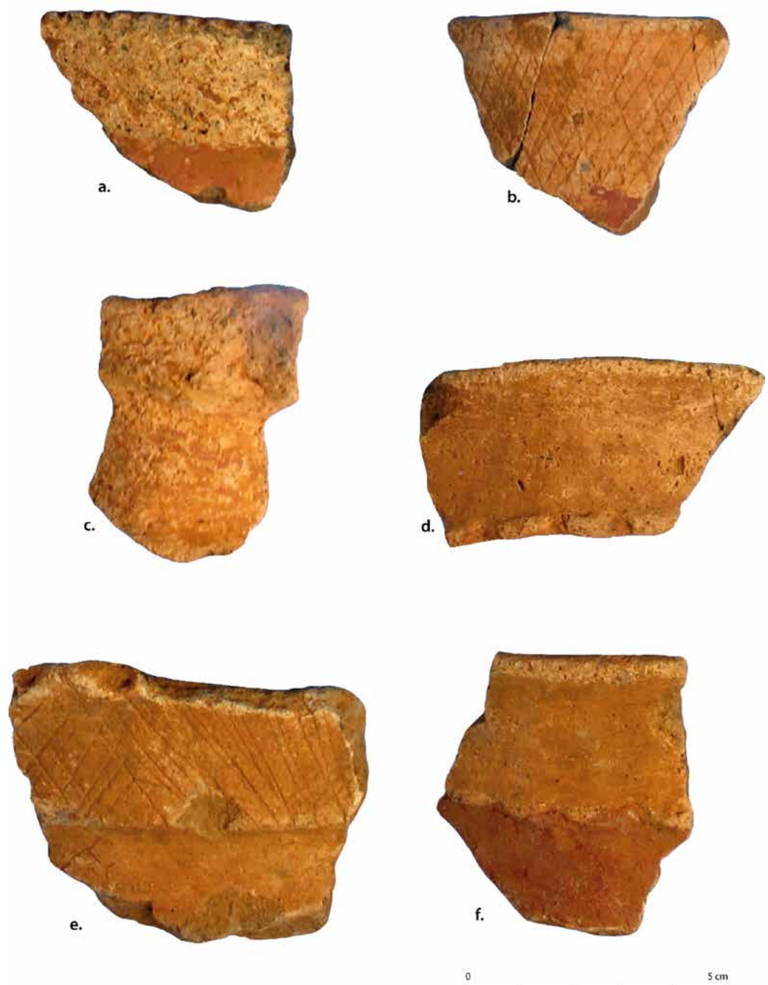


Figure 9.25. Decorated collars (1): (a) EC 26, nail-indented lip with wavy-lines and red slip (band), (b) EC 57, treilles and red slip (band), (c) EC 82, wavy-lines, (d) EC 126, indented clay strip around base of collar, (e) EC 157, hastily applied treilles with finger-indentations on the rim and (f), EC 148, finger-indentations and a red band.

Island of Marajó have yielded polychrome painted ceramics with similar complex designs of which the stylised snake appears to a symbol of importance (Schaan 2004:358). For comparison, compare the spirales found on painted Koriabo ware from Goliath Kreek in Suriname (Boomert 2004:264, Fig. 3b) or 'in a river west of Suriname' (Rostain 2009:49, Fig. 3.8), Rio Camutins (Palmatary 1950:390, Fig. 32c and p. 431, Fig. 73b) or even further afield on the Upper Amazon River (Weber 1975:152a, Fig. 26a–c)[228], with the PK 11 register. In addition to the latter LCA sites, the non-decorated Koriabo vessels, i.e. EC 77, EC 247, reflect morphological similarities with Koriabo pots found not only at Sainte-Agathe, but also at Saut-Saillat and Eva 2, corroborating a very late LCA date (cf. Section 11.6.2).

228 This particular site also yielded vessels with oblique alternating incisions, or chevrons, evoking a certain hair style among these Amerindians (Palmatary 1950:416, Fig. 58a-d). Further interpretation is not discussed here. However, the (stylised) presence of snakes, toads, caymans, monkeys, jaguars, birds and frogs plays an important role in Amerindian myth and society as, for example, Lévi-Strauss states: 'We can no longer doubt that the key to so many heretofore incomprehensible motifs is directly accessible in myths and tales which are still current. One would be mistaken to neglect those means which enable us to gain access into the past. Only the myths can guide us into the labyrinth of monsters and gods, when in the absence of writing, the plastic documentation cannot lead us further' (Lévi-Strauss 1967:267).

Figure 9.26. Decorated collars (2): (a) EC 182, treilles and red slip (band), (b) EC 66, eroded treilles and red slip (band), (c) EC 163, treilles and a red slip (band), (d) EC 200, treilles and finger-indented rim and (e) EC 227, treilles and a red slip (band).

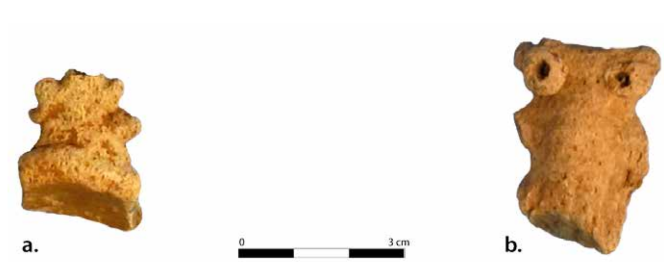


Figure 9.27. Two modelled appliqués or adornos: (a) F 178 and (b) F 165.

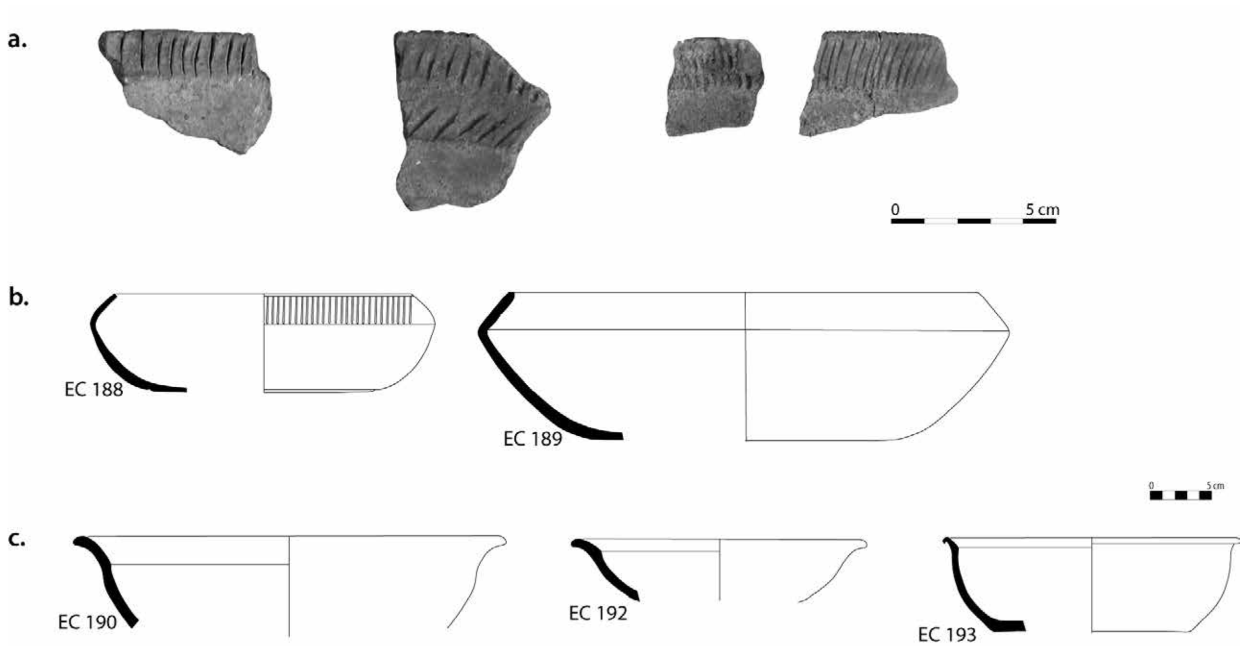


Figure 9.28. The ceramic material found in pit F 158: (a) examples of Ouanary encoché applied on the interior of the lip, (b) restricted vessels and (c) open vessels.

Early Aristé on Cayenne Island?

The radiocarbon date recorded for pit F 158, i.e. 1635 ± 30 BP, is too early for the LCA occupation. Numerous, coherent, more recent dates as well as an entirely dissimilar ceramic ware confirm this. This pit, of which the function as yet remains rather mysterious, yielded a small restricted bowl (EC 188) with regular-spaced and parallel vertical incisions. It differs clearly from the apparently hastily incised, parallel obliques applied to Form A which resembles a specific recipient found in eastern French Guiana and attributed to the style named *Caripo kwep* (Rostain 1994a:820, Fig. 89.11) (Fig. 9.28b). Aside from this bowl, the pit fill also yielded four rims with single or double series of thin, probably fingernail, incisions applied to the inside of a flattened or concave lip that often includes incisions too (Fig. 9.28a). These highly recognisable, decorated rim sherds were found for the first time during excavations at the rock shelter sites of Carbet Mitan and Abri Marcel at the mouth of the Oyapock River and dubbed *Ouanary encoché* by Rostain (1994a:81, 816, Figs. 85.1-9).

It is true that this type of decoration was defined as to eastern French Guiana and recognised even further afield to the east in the northern part of the State of Amapá (João Saldanha, personal communication, 2011). However, it was also recorded for numerous –mostly LCA– sites on Cayenne Island. For instance: (a) including the CPP-survey (Hildebrand 2004, Plate 3, Trench 8), (b) Vieux Chemin (van den Bel 2007d:88), (c) Mont Grand-Matoury (Hildebrand 2000, fig. 48.10), (d) various ring-ditched sites, such as Pointe Maripa at the Comté River, and to east of Cayenne Island and (e) at the first millennium ring-ditched sites of Favard and Blondin (Mestre 1997, 2006b, 2013; SRA 2000).[229]

229 Jérôme Briand recorded the presence of *Ouanary encoché* at the site of Montagne Favard during a quick scan of the ceramic material found in the ditch (Mazière 1996:33). Rostain (1994:421) reported rare Aristé incursions to the west of the Approuague River: 'Nos travaux ont en outre montré clairement quele complexe Aristé ne s'étendait pas au-delà des collines d'Ouanary, à l'exception de quelques rares intrusions sur l'Approuague, l'île de Cayenne et, peut-être, la Montagne de Kaw.'

Site	C^{14} age BP	Lab. No.	Reference
Abri Marcel	1170 ± 30	OBDY-800	Rostain 1994a
Abri Marcel	1310 ± 35	OBDY-797	Rostain 1994a
Abri Marcel	1400 ± 60	OBDY-795	Rostain 1994a
Abri Marcel	1430 ± 30	OBDY-799	Rostain 1994a
Abri Marcel	1470 ± 40	OBDY-798	Rostain 1994a
Abri Marcel	1790 ± 30	UGAMS-4056	Coutet 2009
Carbet Mitan	1340 ± 25	UGAMS-4054	Coutet 2009
Carbet Mitan	1650 ± 40	OBDY-650	Rostain 1994a
Carbet Mitan	2070 ± 45	OBDY-653	Rostain 1994a
Cimetière paysager Poncel	1635 ± 30	POZ-44824	van den Bel et al. 2013
Favard	1750 ± 45	LY-7839	SRA 2000
Mont Grand Matoury	1360 ± 30	LY-7756	Grouard et al. 1997
Mont Grand-Matoury	2055 ± 45	LY-7784	Grouard et al. 1997
Pointe Blondin	1465 ± 25	KIA-30207	Mestre 2006b
Pointe Maripa	1740 ± 25	UGAMS-4048	Gassies and Mestre 2012
Pointe Maripa	1710 ± 25	UGAMS-4049	Gassies and Mestre 2012
Pointe Maripa	1930 ± 25	UGAMS-4050	Gassies and Mestre 2012
Pointe Maripa	1600 ± 25	UGAMS-4051	Gassies and Mestre 2012
Pointe Maripa	2160 ± 30	UGAMS-4052	Gassies and Mestre 2012
Pointe Maripa	1685 ± 45	LY-7696	Mestre 1997
Pointe Maripa	1750 ± 45	LY-7839	Mestre 1997

Figure 9.9. An overview of radiocarbon dates from the first millennium AD taken from sites between Cayenne Island and the Oyapock River associated to Ouanary encoché, knowing these dates do not necessarily refer to this specific type of ceramics. Note that the Abri Marcel measurements were performed on shell.

When compared with the latter sites, the CPP date of pit F 158 is not erroneous at all. It fits well with other ECA-B sites where, how fortunately, *Ouanary encoché* was found too (Table 9.9). Altough these elements may be the result of exchange and/or cultural influences, it may, however, also represent the remnants of a physical presence of an Early Aristé population on Cayenne Island which was blurred by means of the implantation of a LCA population on the same sites.[230] Once again, it was not only demonstrated that archaeological sites have longer occupation spans as one expected but also that archaeological material found in layers must be handled with care if one wants to draw conclusions. Without doubt, it is now clear that *Ouanary encoché* is another ceramic ware requiring further attention as to its chronology and geographical distribution (cf. Section 9.8).

9.6 The lithic study

The lithic assemblage presented here was collected from the Squares G2-Q6 as well as from the various features. It was studied by Sandrine Delpech (in van den Bel et al. 2013:70–76) (Table 9.10) and consists of 211 pieces, subdivided

230 The present author found several rare "ceramic grater" fragments at the summit of Mound Paramana to the southeast of Matoury (van den Bel 2012). Cf. Section 12.5.2 as to such ceramic graters.

	Tools	N
Quartz debitage	Flakes	2
	Fragments	15
	Cores	1
	Milling stones	18
	Polissoirs	11
	Grinding stones	16
	Mortar	1
	Quebra-coco	1
	Lissoirs	8
	Axe	1
	Axe flake	1
Undetermined	Abraded	14
	Abraided fragments	5
	Manuports	116
	Stone vessel	1
		211

Table 9.10. The general lithic count.

into 94 tools, 116 pebbles as well as numerous rocks, undetermined fragments and a single stone vessel (Annexe 7.3.1).[231] A translated and abridged version is presented here.

9.6.1 The raw materials

The quartz

Quartz is one of the predominant rock materials at the site and utilized here in order to denote the macrocrystalline variety of silicium dioxide, one of the main rock forming minerals in the world. This material is very resistant and readily available in French Guiana in the form of blocks from emerging veins or as waterworn pebbles present in riverbeds. At CPP, as we have previously seen, two varieties of quartz have been collected: (a) hyaline, or milky quartz, and (b) saccharin quartz. The former, high quality variety has been applied in the majority of cases (83.5%) whereas the saccharin one, of lesser quality, is less popular.

Quartz flaked stone only represents a very small portion of the lithic collection. Therefore the description of its characteristics remains anecdotic. It includes two flakes, 12 waste fragments and one flake core. The latter is small and measures between 2 and 4 cm. Despite the fact that the collection methodology at the site is to a large extent responsible for the small quantity of quartz flaked stone recovered, the absence of larger sized hammer stones and anvils also reflects that this site was not an important quartz working site.

231 The raw materials from this site have been determined with the aid of geologist David Deliance. Notably in the tropical environment of French Guiana, any heavy weathering of the surface of numerous types of rock resulting in iron patina does not permit a proper classification. In most cases a fresh fracture is necessary in order to see the interior, an often less affected part of the rock. However, such a destructive method is not appropriate for artefacts. For this reason the raw material has not been identified in certain cases.

The magmatic rocks (plutonic and volcanic)

This is the most popular type of rock and consists of (leuco) granites, granodiorites, (micro) diorites, gabbros, dolerites, metatufs and aplites. The granites with an average to coarse mineral grain size are the most popular ones and believed to have served as grinding stones albeit that further microscopic research is certainly necessary. The volcanic rocks with a finer texture, notably metatufs, have been collected as raw material for axe manufacture. As these rocks are exotic to Cayenne Island, it is likely that the Amerindians of CPP travelled some distance in order to collect this rock or else obtained it through exchange with other communities. One very exceptional object is represented by means of a stone vessel (F 96) made of an ultramafic, ingenous rock variety which is poor as to silicium. Its high olivine contents renders it very difficult to exactly determine its igneous rock type as well as its provenance (Fig. 9.31).

The metamorphic rocks

These rocks originally represent magmatic or sedimentary rocks that have changed in mineralogical composition and build-up as a result of high temperature or pressure. Identified rock types include: amphibolite, gneiss and three fragments of quartzite.

Sedimentary rocks

The assemblage includes three sandstone fragments which have served as polishing and sharpening tools. This type of rock is also exotic to the site area and therefore represents another indication of a more distant acquisition of rock materials. One iron-oxyde piece served as an abrader.

9.6.2 The stone tools

The querns or passive grinding stones

These stones are the most important tools found at this site (N=29). They generally consist of flat implements with one or both flat faces smoothly abraded due to repetitive usage. The majority has a rectangular or trapezoidal cross-section. Among the raw materials granite, gneiss, amphibolite and sandstone have been identified.

Based on their shape, they have been divided in two classes. The first class (N=11) corresponds to: (a) relatively small tools measuring between 6.4 and 11.5 cm in length and between 5 and 8 cm in thickness. Moreover, one of two flat faces have served as grinding platforms. Several also feature abraded edges, suggesting they have also been utilized as active tools. The second class (N=18) consists of (b) querns of a much larger size measuring between 12.5 and 51.2 cm in length and between 8 and 19 cm in thickness. Their sheer weight favours an interpretation as passive querns or grinding stones. They show eminent evidence of a prolonged usage across one entire face.

The starch grain analysis of three granite querns, to wit: Nos. L 18.01, O 11.03, M 10.05 (starch grain samples CPP-5 to 7 respectively) illustrate they mainly served when grinding maize (*Zea mays*) and sweet potatoes (*Ipomoea batatas*). This confirms the function of these tools (cf. Section 9.7).

The active grinding stones

Pebbles or fragments of pebbles (N=15) have served as grinding stones or *manos*. Identified raw materials include: dolerite, diorites, amphibolite and aplite. The majority has a circular to oval shape with an ovoid cross-section. These tools measure between 6.8 cm and 10.2 cm in length and 4 to 5 cm in mean thickness. They exhibit abraded used areas on both flat faces and on occasion on their sides. They can be considered as the hand-held implements that were rubbed against quern bases during food processing. One aplite specimen (No. J 04.01) displayed traces of percussion on two sides and may have served as a pestle. An unidentified rock specimen (No. 150.03) included traces of hammering at the centre of each abraded side and was identified as a nutcracker, or quebra coco (Br.), or as pitted anvil. Moreover, it appears that during the final phase of this object, it served as a grinding stone because older hammering traces are blurred due to later abrading. One roundish leucogranite pebble (No. J 4.02) measuring less than 10 cm in diameter has one slightly flattened side and has also been classified as a nutcracker. In the middle of the latter side it features a small percussion hole with a diameter measuring at least 2 cm (Fig. 9.24a).

One dolerite fragment (No. 14.01), measuring 14.2 x 11.3 x 7 cm, has a rounded side or edge and one face has a notable concaveity. This must have been formed due to the simultaneous motion of pounding and rubbing with an active tool (Fig. 9.24b). This concave tool has been interpreted as a mortar. It was probably applied to crush vegetal matter. The above-mentioned aplite pestle may have served as the active counterpart for this grinding stone.

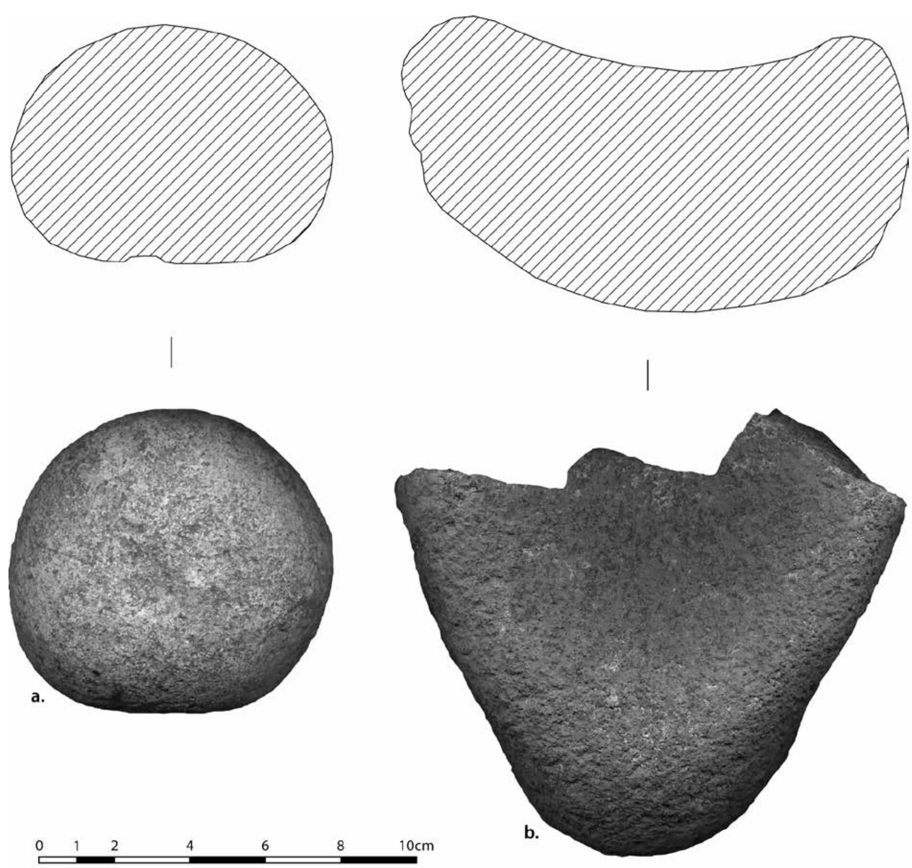


Figure 9.29. (a) J 04.02, a pitted anvil or nutt-cracker and (b) 14.01, the milling stone/mortar made of dolerite (photograph and drawing by Sandrine Delpech).

Eight pebbles consisting of amphibolite, sandstone, microgabbro and unspecified rock have been identified as polishing stones (Fr., *lissoirs*). These tools differ from *manos*, or active abrading stones, because of their smaller size, varying between 3 and 6 cm, as well as their more elongated morphology. The majority has one flat abraded face which is the result of repeated rubbing the pebble against a hard surface (e.g. the exterior of a ceramic vessel).

The stone vessel

Feature 96 represents a stone vessel (No. 96.01) encountered upside-down and fractured in layer US 2000. It is made from an ultramafic rock and has a slighlty ovoid orifice measuring 29 x 24 cm. Its height measures 14.5 cm (Fig. 9.31). In its present state it is a highly weathered piece of rock. Even the fractures exhibit signs of deterioration/erosion. Its roundish shape and ovoid orifice is marked by means of opposed labial, semi-rectangular handles or apexes. The rounded lip of the rim tends to flatten when approaching the apex. The symmetry of this artefact is impressive revealing a remarkable stone object as well as extraordinary craftmanship.

This vessel shows affinity with two other rare objects: a polished diorite recipient found at the Upper Sikini River (Abonnenc 1952:52, Fig. 10) and another found at Rorota (Lefèbre 1973). A sample taken from the interior bottom of this vessel revealed starch grains of maize, suggesting it had either served as a mortar when processing of food for consumption.

The axes

Axes are only represented by means of an incomplete example of an indented axe, missing the edge part (Fig. 9.30a). It measures 6.9 x 6.2 x 2.6 cm and has an ovoid cross-section. Both lateral sides feature an indentation. The rounded heel has been created by means of polishing and features several few traces of hammering. This suggests that, after being used as an axe, the tool had been reutilized as a bifacial polishing tool or *mano*. In addition to this incomplete specimen, one meta-tuff flake (No. 151.08, < 6 cm) has been recognized as being struck from a polished axe.

The manuports

These stones comprise all rocks (N=116 for 24.5 kg) of varying sizes collected during the excavation, but do not exhibit any signs of working or macroscopic use-wear. They include: granites, granodiorites, dolerites, quartzite pebbles, quartz blocks, duricrust fragments as well as several other rocks which cannot be naturally found in the immediate surroundings of the site. These must have been brought to the site for as yet unidentified purposes which left no traces on the material. Several may have served wooden posts.

The unspecified rock

The unclassified pieces include one small block consisting of meta-tuff (No. H 02.01) with a trapezoidal shape of which two sides have been formed by means of flaking. It presumably represents an axe preform or roughout in its initial stage of manufacture. This small object measures 10.3 x 7 x 3.5 cm (Fig. 9.30b).

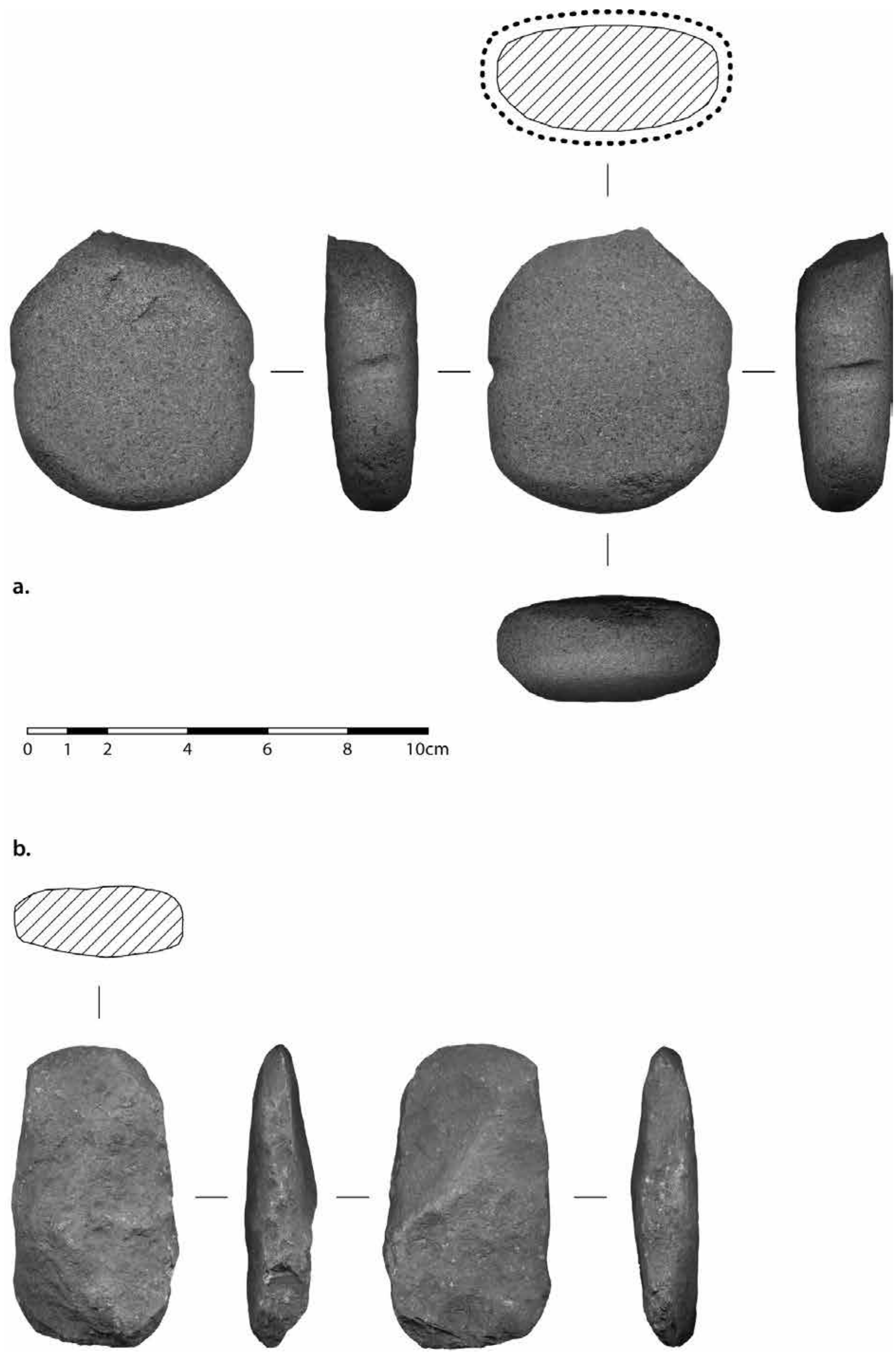


Figure 9.30. (a) K 12.03, an indented axe and (b) H 02.01, undetermined worked tool (photographs and drawing by Sandrine Delpech).

Eighteen other objects include a variety of blocks, pebbles or pebble fragments. Many possess small parts exhibiting signs of being used or worked. Unfortunately, these parts are too small or the pieces too fragmented in order to properly classify them as types of tools or artefacts.

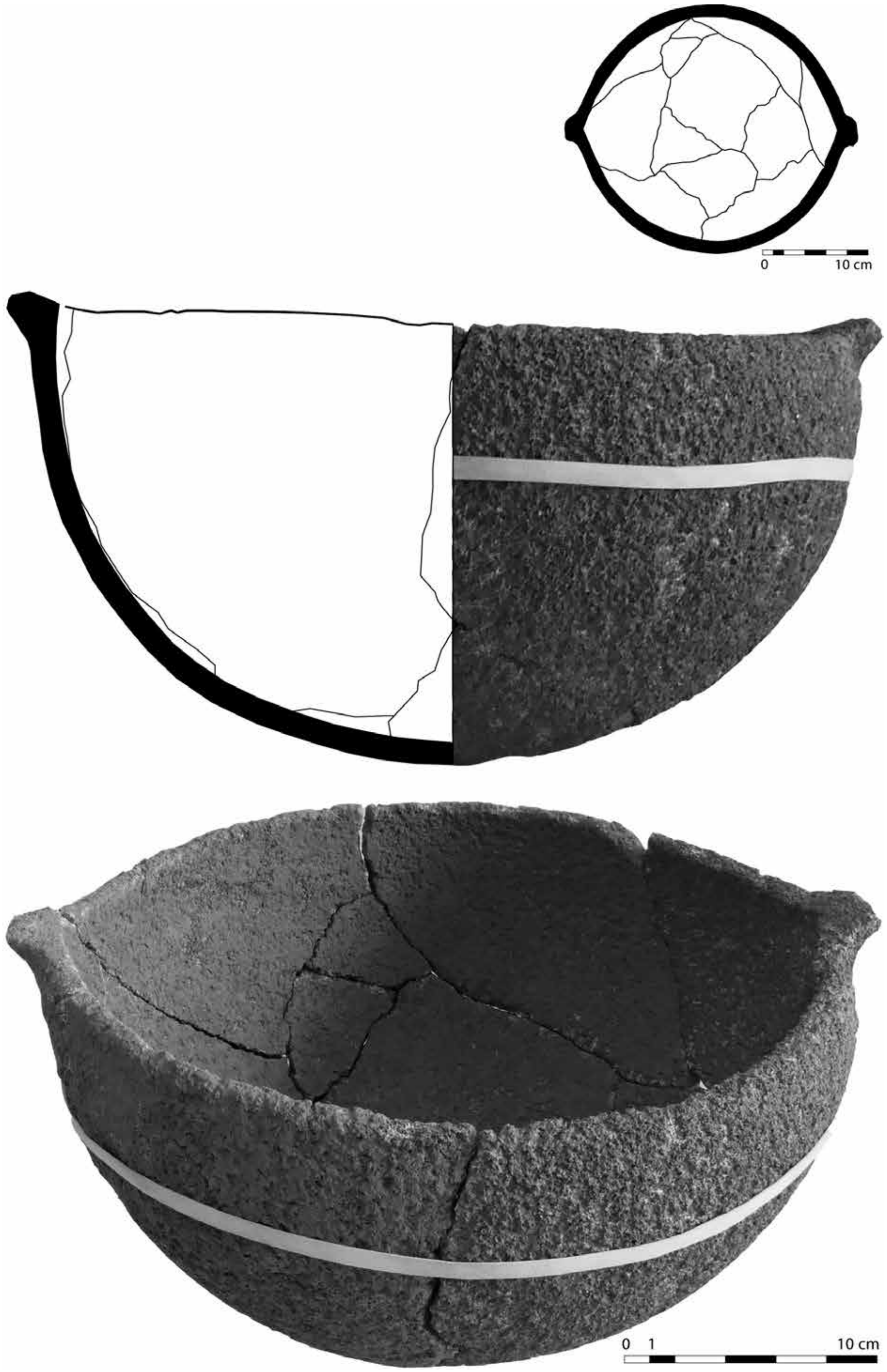


Figure 9.31. The stone vessel F 96 (photographs by Sandrine Delpech).

9.6.3 Final remarks

Considering the size of the excavated area, the total amount of lithic tools recovered can be considered rather small. The production of quartz flakes appears to be almost absent whereas the abundance of querns and related tools is striking, i.e. *c.*58%. These figures suggest that vegetal products, notably maize and sweet potatoes were processed locally at this site.

The majority of lithic raw materials originated from the immediate vicinity of the site, but also from further away (e.g. sandstone). Several unique tools and objects (the stone vessel) may have been obtained from a long distance, most likely, through exchange.

9.7 The starch grain analysis

In total, we took ten artefacts, labelled CPP-1 to CPP-10, destined for starch grain analysis to be carried out by Jaime Pagán Jiménez (in van den Bel et al. 2013:77–88) (Table 9.11, Annexe 7.4). For each of these four lithic and six ceramic objects one sample was acquired: the lithic objects (CPP-4, CPP-8 to 10) were sent to Porto Rico and prepared by Pagán Jiménez. The present author sampled the ceramic artefacts (CPP-1 to 3, CPP-5 to 7) in Cayenne. As to each sample sediment was taken from various spots on the object (pin-pointed samples). Because the artefacts CPP-2 to 4 were considered kitchen tools, it was decided to sample the interior wall of these sherds as they evidenced remarkable carbonised material or soot (cf. Section 1.3.2 for the methods and taxonomy). An abridged version of the original report is presented here.

9.7.1 The results

Table 9.12 presents us with a summary of the results obtained for this study. It should be noted that in this table, ubiquity (expressed in %) comprises approximate ("cf.") as well as secure identifications and that it refers to the occurrence of the identified taxa between the sample spectra. The abundance of species combines both approximate and secure identifications. We will now comment briefly on each artefact.

CPP-1 (F 96, stone vessel)

This artefact only provided three starch grains. Two hereof, however, were identified as maize derived starches whereas the third could not be identified. They all had marks of damage caused due to pressure, probably grinding, at various degrees. Fortunately, the two maize starches retained sufficient morphometrical characteristics in order to ascribe them to a certain species. The third starch grain could not be ascribed to any taxa due to heavy damage.

No.	EC	Feature	Square	Object
CPP-1		96		lithic vessel
CPP-2	67	101		ceramic fragment
CPP-3	77	117		ceramic fragment
CPP-4	230	199		ceramic fragment
CPP-5			L18.01	milling stone
CPP-6			011.03	milling stone
CPP-7			M10.5	milling stone
CPP-8	256	151.2		griddle fragment
CPP-9	257	199		griddle fragment
CPP-10	254	200		griddle fragment

Table 9.11. The starch grain samples and the provenance of artefacts.

	CPP-1	CPP-2	CPP-3	CPP-4	CPP-5	CPP-6	CPP-7	CPP-8	CPP-9	CPP-10	Total	Ubiquité (%), Famille et/ou Genre par artéfact
	Lithic vessel	Sherd	Sherd	Sherd	Milling stone	Milling stone	Milling stone	Griddle	Griddle	Griddle		
Tubers												
cf. *Ipomoea batatas*							2				2	10
cf. *Marantaceae*		1	1								2	20
Calathea sp.							2				2	10
Seeds												
Zea mays	1	14	7	5	28	9	4	3	4	6	81	100
cf. *Zea mays*	1	14	4	2	12	10	6	2	6	9	66	
cf. *Capsicum* sp.			1								1	10
Leguminoseae-Fabaceae						1					1	50
cf. Leguminoseae						1			1		2	
Fabaceae		1		1				1	6		9	
cf. Fabaceae		1		3					2		6	
Phaseolus sp.									2		2	10
cf. *Phaseolus* sp.									1		1	
cf. *Canavalia* sp.						5	2	1			8	30
Zea mays (clustered)					ca. 70						ca. 70	10
cf. *Zea mays* (clustered)					ca. 10						ca. 10	
cf. Arecaceae (clustered)								ca. 150	ca. 35 and ca. 30		ca. 215	20
Not identified (individual starches)	1	3	6	2		1	6	9	3	2	33	----
Not identified (clustered)				ca. 35			ca. 60		ca. 6 and ca. 12		ca. 113	----
Total starches (individual)	3	34	19	13	40	27	22	16	25	17	216	----
Total starches (individual and clustered)	**3**	**34**	**19**	**ca. 48**	**ca. 120**	**27**	**ca. 82**	**ca. 166**	**ca. 108**	**17**	**ca. 624**	**----**
Species richness (Family and/or Genus level) per artifact considering secure and tentative identifications	1	3	3	2	1	3	4	4	4	1		

Table 9.12. The distribution and the identification of the encountered starch grains.

CPP-2 (F 101, EC 67)

This artefact most likely pertained to a cooking vessel, considering the charred crust attached to the inside wall. It is assumed that the kind of charred residue analysed here corresponds with the charred foodstuffs resulting from burned food during the cooking process and that therefore our sampling with regard to a starch grain analysis was guided by means of this black mass.

Interestingly, on the one hand, 34 starch grains were recovered within the charred residue. However, only four revealed apparent signs of damage caused due to heat of which only one revealed exclusive signs of such damaging. On the other hand, 31 starches revealed clear signs of damage due to pressure at various degrees. It was thus revealed that grinding, or a similar processing technique, had been applied to the organ sources of the starches prior to its integration into this bowl. The plants identified for this specific artefact are: (a) maize (secure and tentative identifications), (b) vegetables (Fabaceae, secure and tentative identifications) and (c) Marantaceae (tentative identification). Three individual starches could not be identified.

The majority of the recovered starches were ascribed to maize. Fourteen starches were securely identified whereas the other half was tentatively identified. Secure identifications of maize were established on the basis of shape, size and other incorporated features (e.g. hilum, double border, surface). Certain maize starches revealed signs of damage due to pressure while others did not. The size range of these secure maize identifications oscillates between 15 and 34 µm. Only the heavily altered starch grains reached sizes up to 33 and 34 μm. When excluding these heavily altered maize starches, the common size range varies between 15 and 28 μm.

The tentatively identified maize starches (N=14) showed clear morphometric features characteristic of maize starches. However, in many of these cases, damage due to pressure altered and/or distorted several important features preventing a secure identification. The sizes of these starches ranges between 24 and 34 μm which is consistent with the size ranges of maize starches affected because of pressure (Annexe 7.4, Appendix B; Mickelburgh and Pagán Jiménez 2012).

Two starches were ascribed to legumes at a family level: a secure and a tentative identification. On the basis of its shape and the Maltese cross, together with an elongated central depression, we may presume this starch grain corresponds with a wild species of bean. The other tentatively identified starch grain may well correspond with a wild species of bean too, based on its morphometric characteristics. However, signs of damage due to heat were recorded for this granule which most certainly altered certain important features, e.g. size, surface features such as lamellae, etc., preventing a secure identification to any taxonomic level.

Three starches were not identified due to the absence of a combination of morphometric features which allow a feasible interpretation. Interestingly, one starch grain (Annexe 7.4, Appendix B, Granule 26) revealed combined signs of damage produced due to heat and pressure. Signs of damage due to heat consist here of a "big scoop" located at the centre of the starch which is consistent with damage caused due to boiling. In the same case, radial striations were observed, associated with damage due to pressure. This specific starch grain shares two features (size and shape) with legumes, but it was impossible to detect more combined features enabling us to establish a confident identification.

Artefact CPP-3 (F 117, EC 77)

This second ceramic fragment probably pertains to a cooking vessel. The analysis here was directed at the charred residue attached to the interior wall. However, contrary to the previous artefact, the majority of the starch grains show evident signs of heat damage at various levels, now and again combined with pressure damage. In total, 19 starch grains were recovered. The majority hereof was either securely or tentatively identified as maize (N=11). The others were tentatively identified as a Marantaceae or as chili pepper. Six individual starches were not identified.

The securely identified maize starches (N=7) oscillate in size between 15 and 30 μm although the common size ranges between 18 and 23 μm. They revealed signs of both heat and pressure or of a combination of one of these two damaging factors (Annexe 7.4, Appendix C). Tentative maize identifications (N=4) registered similar size ranges and signs of damage consistent to heat. The tentative identification of chili pepper was established by means of recovery of a single starch grain with three of the main features (e.g. shape, size, distal fissure) referred to as the main key sources for recognizing chili pepper starch grains of domestic species (Perry et al. 2007). The oval to ellipsoidal shape of this starch (observed when rotated), together with its size (30 x 22 μm) and fissure, are features highly consistent with domestic chili pepper starch grains. The only feature without a secure identification was the projection of a bright Maltese cross which was referred to as an element that easily disappears in chili pepper starches after minute damage (e.g. pressure).

A Marantaceae family starch grain was also tentatively identified. The size, shape and the presence of the Maltese cross documented for this grain are known to occur in other Marantaceae specimens (Pagan Jiménez 2007). However, damage apparently produced due to heat, resulted in a rough and "amber" colouring of the surface obscuring the confident identification of other key features (e.g. lamellae).

Six individual starch grains were not identified due to various reasons. Four starches showed clear signs of damage due to heat: changes in surface colour and a scoop presumably produced by boiling, whereas the other two showed signs of pressure. These indicators of damage, together with changes in shape and size derived from this processes, did not enable us to identify these starches.

A general, visual comparison between the starches recovered from the artefact CPP-3 and those from CPP-2 (Annexe 7.4, Appendices B-C), reveal dissimilar states of preservation. In spite of the fact that both starch groups were recovered within a charred residue of two ceramic fragments, only CCP-3 displayed signs of damage related to heat (e.g. rough "crystallized" surfaces with small particles on it and "amber" colouring).

Artefact CPP-4 (F199, EC230)

This artefact, the third potsherd fragment to be analysed, has a charred residue attached to the interior wall. A part hereof was radiocarbon dated 895 ± 30 BP (POZ-44834), creating a direct link between starches and the ceramic sequence. Plants (e.g. maize, legume), were securely and tentatively identified. Two individual starches and a cluster of approximately 35 small starches could not be identified to any taxonomic level. Two of 13 individual starches showed signs of heat damage. The remaining 11 as well as one of the previously mentioned starches registered signs of damage due to pressure at various degrees (Annexe 7.4, Appendix D).

The sizes of secure and tentative maize starch grains (N=7) range between 19 and 33 µm. The largest size was registered in one of the tentative identifications. It also displayed signs of heavy damage due to pressure. However, the common size ranges of maize starches oscillates between 19 and 27 µm. This is consistent with regard to starches of many maize landraces submitted to various degrees of pressure (Annexe 7.4, Table 2).

Other starches (N=4) correspond to legumes (Annexe 7.4, Appendix D). One was securely identified as Fabaceae. Due to evident heat and pressure damage this starch grain has a size probably exceeding normal proportions. Consequently, a precise identification could not be allowed. The other three legume starches were tentatively ascribed to Fabaceae of which one diplayed signs of heat. The other two showed sings of pressure. Two starches, one affected due to heat and the other due to pressure, reached the size of 38 and 34 µm respectively. This is not often encountered with regard to domestic starch legumes (e.g. *Phaseolus* sp.). However, the normal size of these two starches could have been altered by means of the damaging processes as described above. As much as 33% of these tentative identifications correspond in size (28 µm) whereas other morphological features (e.g. shape, lamellae) correspond to the starches produced by wild legumes. Nontheless, important features (e.g. long, linear or asymmetric fissures) are not present preventing a confident identification to the family level.

Unfortunately, a cluster of about 35 starches, trapped in cellulosic tissue, could not be ascribed to any taxa (Annexe 7.4, Appendix D). These starches range in size between 6 and 8 µm and are packed within the tissue. Due to the nature of this tissue, it was not possible to satisfactorily document specific features, such as hilum and shape.

Two other individual starches could not be taxonomically identified despite the fact that both grains show pressure facets resembling maize starches, a Maltese cross and measure between 30 and 41 µm respectively. These maize starches are closer to starches produced in tubers. Their polygonal shapes, when combined with all these features, make it difficult to ascribe them to a specific plant source, but they probably originate from the same plant source.

Artefacts CPP-5, CPP-6 and CPP-7 (L 18.01, O 11.03 and M 10.05 respectively)

These lithic artefacts represent three (non-washed) granite querns or passive grinders. They enabled us to retrieve a large quantity of individual starch grains as well as several clusters of maize starches from quern L 18.01 (CPP-5) (cf. Section 9.6.2, Annexe 7.4, Appendices E-G). The most common starches identified in all these tools originated from maize starches. Two grinding stones presented us with legumes, which probably originate from wild species, including *Canavalia* sp.

Interestingly, one of the querns (CPP-5) yielded only individual and clustered maize starches accounting for a possible exclusive purpose of this artefact: processing maize kernels (Fig. 9.32). This artefact differs from artefacts CPP-6 and CPP-7. The starches were found in its impressively polished surface. The active surface has a highly concave section suggesting that this artefact was heavily utilised when grinding plant organs, namely maize kernels with a *mano*, or that its surface was (pre) worked prior to its use as a grinding tool. The other two querns or milling stone bases have polished, used surfaces attesting little or no intentional modification prior to their integration as grinding tools.

Tentative and secure identifications of the maize starches found in artefact CPP-5 revealed that pressure ranged from little to heavy, affecting them in most cases. At least one starch shows clear signs of heat alteration. The two starch clusters of the same species were found in arrangements characteristic of modern maize starch reference collections. One cluster consists of approximately 70 heavily packed starches. The other one has at least ten starches more. The general size range of all these individual maize starches (secure and tentative identifications) oscillates between 15 and 37.5 µm whereas the common size range falls within 22 and 27 µm. The larger maize starches (larger than 30 µm) coincide with a heavy (pressure) damage observed on them. One cf. *Zea mays* starch grain measures 37.5 µm. It represents a damaged starch grain consistent for pressure and heat (Annexe 7.4, Appendix E).

As to artefact CPP-6, tentative and secure maize starches sizes oscillate between 14 and 33 µm, while the common range falls within 25 to 33 µm. Only two maize starch grains, measuring 14 and 18 µm respectively, revealed no pressure or heat damage at all (Annexe 7.4, Appendix F). The remaining maize starches show various degrees of damage due to pressure. Tentative and secure identifications of maize starches in artefact CPP-7 oscillate in size between 18 to 33 µm whereas the

Figure 9.32. A solid rectangular shaped milling stone base (L 18.01) made of granite, weighing c.32 kg, and measuring 36 x 35 x 15 cm. The sample CPP-5 was taken just above the plastic label, where scraping marks are still visible.

common range falls within 26 and 31 µm. All these maize starches revealed various degrees of pressure damage and in one case, of heat (Annexe 7.4, Appendix G). The shapes, fissures, pressure facets and the presence of a double-border observed on many recorded maize starch grains of these three artefacts, are highly consistent with the key features described in reference collections of this species (Holst et al. 2007; Pagán Jiménez 2007). Thus, both tentative and secure identifications were proposed for a combination of all these morphometric features.

Other recovered starches were ascribed to legumes, to wit Leguminoseae-Fabaceae, cf. *Canavalia* sp., for CPP-6 and CPP-7 and to *Calathea* sp. and cf. *Ipomoea batatas* for CPP-7. Their presence indicates that these milling stone bases served not only to grinde maize kernels, but also to grind seeds, legumes, tubers and rhizomes. The only legume ascription to the genus level occurred with regard to *Canavalia* sp. starch grains. In these cases, starch grains were tentatively identified to this level. Their altered state due to pressure (Annexe 7.4, Appendixes F-G) rendered any further observation and analysis impossible.

Strikingly, two of these *Canavalia* sp. starches also showed signs of damage due to heat regarding CPP-6 (Annexe 7.4, Appendix F) together with a starch judged to Leguminoseae. The general size range of these *Canavalia* sp. starches varies between 32 and 52 μm. Recorded features, such as oval shapes in combination with linear and radiating fissures and conspicuous lamellae (e.g. concentric rings, symmetric circles) are all known elements with regard to *Canavalia* sp. starches producing morphometric characteristics dissimilar to other legumes, such as *Phaseolus vulgaris/lunatus* (Pagán Jiménez 2007; Piperno and Dillehay 2008; Mickleburgh and Pagán Jiménez 2012).

CPP-7 revealed two *Calathea* sp. starches as well as two tentatively identified as *Ipomoea batatas* (Annexe 7.4, Appendix G). The recorded *Calathea* sp. starches have conspicuous shapes (oval to elliptical and spherical), commonly observed in various current species of this genus as well as the Maltese crosses and lamellae (in the case of the spherical one), as characteristically found in the same contemporary references (Pagán Jiménez 2007). In spite of the fact that both starches share the shape and an overall size (33 μm and 45 μm long) with present-day *Calathea allouia* starches, it was impossible to refine this identification due to notable damage (pressure and heat) of their surfaces. Rotation was applied to one of the starches (Annexe 7.4, Appendix G, Granule 11), hereby partially revealing the diagnostic shape and size of a *Calathea allouia* starch, as documented in our current reference collection (Pagán Jiménez 2007, Appendix B).

Tentative identifications of *Ipomoea batatas* as to two recovered starches were proposed by means of the shape in combination with the size, Maltese cross and lamellae (in one case). One starch was affected due to heat and included a central depression or scoop, which commonly emerges when starches (or the organ source) are heated/boiled in a liquid environment.

Among the unidentified starches of all three milling stone bases we came across granules often found in tubers (Granule 21 in CPP-6; Granule 12 in CPP-7) or in seeds which, due to damage or poor mobility during rotation, could not be assigned to any known taxa.

Artefacts CPP-8, CPP-9 and CPP-10 (EC 256, EC 257 and EC 254 respectively)

These artefacts represent three different griddles and may reveal additional information on the process of cooking vegetal foodstuffs. All these yielded maize starch grains (both secure and tentative identifications). Two, i.e. CPP-8, CPP-9, also revealed legume (Fabaceae, *Phaseolus* sp.) as well as palm fruit (cf. Arecaceae) starches. Artefact CPP-8 also produced a single starch tentatively identified as *Canavalia* sp. Out of all the griddle fragments, CPP-10 was the only to produce maize starches (Annexe 7.4, Appendixes H-J).

Starches recovered regarding samples CPP-8 and CPP-9 show clear signs of damage and modifications produced by means of heat and pressure. Heat in a humid to dry environment appears to be the most common damaging vector according to recurrent signs documented for these altered starches. We observed small particles (possibly starch fragments) all over its surface, coinciding with previous results of controlled experiments on starch damage (Henry et al. 2009). This evidence indicates that these two clay griddles served as cooking utensils when producing foodstuffs derived from masses or dough (e.g. flatbread or *tortillas*). Curiously, the majority of the starch grains (from maize and unidentified) recovered in artefact CPP-10 yielded starches visibly affected due to pressure and not due to heat, suggesting that this artefact could have served, at least during its late life history, as a working table when manipulating masses or dough.

The general size range of the maize starches (both tentative and secure identifications) of these three artefacts lies between 15 and 39 μm, while the common size falls between 22 and 29 μm. Larger maize starches of both secure and tentative identifications correspond to the starches previously described. Here the significant enlargement is known to be produced by means of pressure and heat or both (Holst et al. 2007; Mickleburgh and Pagán Jiménez 2012).

Other starches from important plants (e.g. legumes) were tentatively identified to the family level or in some cases securely identified to the genus level of CPP-8 and CPP-9. A small number of starches of the genus commented above are *Phaseolus* sp. from which *P. vulgaris* and *P. lunatus* (in CPP-9) are the best known domestic species. A single and tentative identification of *Canavalia* sp. was also recorded with regard to one of these clay griddles (CPP-8). However, due to significant damage produced mainly due to heat in all the starches originating from CPP-8 and CPP-9, any specific identification to the genus or species level was not obtained.

The artefacts CPP-8 and CPP-9 yielded clusters of small starches tentatively identified as those produced in palm fruits (cf. Arecaceae). One cluster in artefact CPP-8 and two clusters in artefact CPP-9 include groups of starches embedded in a substance, probably cellulosic tissue. Arecaceae starches stored in seed pulp are commonly found within cellulosic tissue. However, general shapes varying between oval to polygonal with size ranges falling between 3 to 9 μm in present-day reference collections, is known to occur in *Acrocomia* sp. rather than in another genus (e.g. *Aiphanes* sp.). Thus, considering the general size ranges and shapes observed in those starch clusters, it is possible to propose that the plant source is a palm fruit, common in the Neotropical indigenous diet (Pagán Jiménez 2012).

9.7.2 Final remarks

The use of artefacts

This study illustrated that the analysed artefacts served various purposes while transforming plant organs into edible foodstuffs. The rare lithic vessel (CPP-1) produced archaeobotanical remains: only two starch grains were identified as maize suggesting that this artefact probably served as a mortar to present or prepare foodstuffs, supposedly during rituals or ceremonies. Beyond this possibility, however, indications of a more specific use of the lithic recipient (quotidian vs. ritual scenario) should be associated with its archaeological context and linked to other objects by means of a further technological and chemical analysis of the artefact itself.

Artefacts CPP-2 to 4 are all fragments of ceramic vessels. They served as cooking pots as determined by means of the presence of charred residues attached to the interior of the vessel walls. In these cases, starch grains were confidently recovered from the charred material, thus indicating that plant residues, such as those of the plants identified here, contributed to the formation of a carbonized mass created during cooking events. More generally, these artefacts were utilized for cooking masses or pastes as a final step prior to consumption (e.g. soups) or as preparation, for instance, of cooking masses later integrated into more complex recipes with further cooking (e.g. *tamales*, *pasteles*).

A distinction should be made regarding CPP-4: numerous starches recovered from the charred material were not clearly affected due to heat suggesting that these starches were probably deposited on or in the charred material during the most recent use of this artefact as a cooking utensil.

Artefacts CPP-5 to 7 are all milling stones bases which definitively served: (a) to grind and (b) to process plant organs (e.g. seeds, tubers, rhizomes). Interestingly, CPP-5 may have served exclusively to grind maize seeds. CPP-6 could have been utilized to process maize and legumes. CPP-7 was used to process maize, legumes, tubers and rhizomes.

Artefacts CPP-8 to 10 are griddles, clearly used when cooking and manipulating plant derivates. The first pair revealed starches heavily affected due to heat. Cooking masses or dough with a minimum level of humidity represents a scenario specifically associated with the baking of flatbread and *tortillas*. Artefact CPP-10, however, revealed starches with little or no signs of heat damage. It was previously suggested that the starch grain conditions of this artefact would attest the use of this griddle as a working table, i.e. as a plain surface for manipulating masses or dough prior to being cooked on another hot clay griddle.

The taxa ubiquity

In short, maize is the most ubiquitous plant among the taxa we identified in all ten samples. Legumes (wild or possibly domestic, including *Phaseolus* sp. and cf. *Canavalia* sp.) were the second taxa of higher ubiquity, followed by cf. Marantaceae (arrowroot or Sp., *lerén* family) and cf. Arecaceae (palm fruits). *Calathea* sp. (*lerén* genus) and possibly sweet potato and chili pepper are taxa with lesser projection among all the samples.

Other important plants for Neotropical economies, such as manioc (*Manihot esculenta* Cranz), cocoyams (*Xanthosoma* sp.) and yams (*Dioscorea* sp./*Rajania* sp.), were not present in the analysed artefacts despite the fact that a variety of tools were considered for this study. Moreover, manioc was not recovered at all in any of the three clay griddles, implements traditionally associated with the preparation of cassava. This scenario suggests that maize, together with legumes, could have played a significant role in the diet of the inhabitants of this site. On the other hand, other well-known plants (e.g. various Marantaceae and palm fruits) were integral parts of what appears to be a mixed vegetal diet in which maize could have been a paramount product. Despite the abundance of maize, it should be noted here that manioc starch grains are difficult to identify when cooked (Chandler-Ezell et al. 2006), perphaps creating a bias. Indeed, caution is recommended when interpreting the results of this study: the samples are part of an apparently persistent occupation, ranging between AD 900 and 1400. In this sense, we cannot be completely sure if, during this period, maize and other plants were this ubiquitous. The reason for this is that each artefact could date from a different occupation moment in this relatively long period spanning approximately five centuries.

For this matter, ubiquity is here a statistical figure. It shows frequency in which any single taxon is present among the sample spectra. Evidently, this should not be extrapolated uncritically when stressing the importance of certain taxa over others. However, regardless of the contextual place of the samples studied here (including those from PK 11), we may suggest that maize and several legume species belonged at least (momentarily) to the most versatile and consistent useful plants during the LCA occupation of this site, because their starches were omnipresent for at least three food processing contexts: (a) in milling stone bases in order to reduce these plants to mass or dough, (b) in cooking vessels in order to prepare single or compound masses and (c) in clay griddles to bake flatbreads or *tortillas*. However, the possibility still exists that legumes, tubers and rhizomes were not only processed but also consumed differently, i.e. without griddles, querns or ceramic bowls. Maize was perhaps also present within a ritual/festive context if one accepts that the lithic vessel is less related to domestic life.

The agricultural production

We will now discuss general examples regarding the cultural and ecological implications of accessing cultivars, domestic and wild species in Neotropical forests by means of applying certain plants we have identified regarding the present study.

Maize depends on humans for its reproduction. Seeds must have been stored for this purpose and were presumably seen to with special care, for example, in containers possibly kept inside structures or stocked 'on platforms along the periphery fo the gardens' as with the contemporary Araweté in Brazil (Viveiros de Castro 1992:94) Although it is generally accepted that maize requires exceptional soils and climatic conditions as to a successful production, it can be grown in rocky soils and specifically in silty clay soils, as pointed out in Chapter 8.

Large, continuous plots of land are not required in order to produce significant quantities of maize, albeit that open or cleared spaces are the key to successful cultivation. Multiple small or larger open plots may have been a common feature of the forest in the vicinity of the Morne Poncel settlement (e.g. Mont Cabassou, Morne Coco, Montagne du Tigre). In addition, the planting of maize in fertile alluvial river valleys or banks, such as Crique Cabassou, is another possibility. Water plays a leading role in maize production because any excess or lack of it easily destroys the plants. A permanent control over the cultivated plots is therefore required. In general, this also applies to other domestic plants, such as common bean (*Phaseolus* sp.) or chili pepper. In the case of other cultivars, to wit arrowroot, sweet potato, *Calathea* sp. and specific chili peppers, it is known (Pagán Jiménez, personal knowledge) that they thrive in partially open or cleared gardens or even under thin canopies upon silty sand, silty clay and sandy loam soils. Arrowroot, sweet potato as well as other edible/medicinal plants of the Marantaceae family may have been cultivated in small or large house gardens, situated at the periphery of the site. It would have also contained medicinal plants, herbs, condiments and fruits. These useful plants could also have been tended at the edges of nearby forested areas.

Wild plants (e.g. palms, Marantaceae) were favoured during collecting trips into the forest, thereby promoting their propagation and dispersal within and beyond the natural habitats. In the latter cases, various ecological habitats could be impacted by harvesting of several of these plants, considering that Marantaceae species (e.g. *Thalia geniculata*) occur along river banks or in wetlands. On the other hand, palm trees and certain "wild arrowroot" species have a wider range of distribution (e.g. slightly covered river banks and/or dense forests). In these latter cases, varied types or degrees of forest management should be developed in order to produce/exchange and harvest any of the plants identified here.

The starch preservation

In terms of the preservation of starch grain, we must note several considerations concerning problematic or destructive artefacts (e.g. ceramic cooking vessels, griddles). The cooking bowls and clay griddle fragments studied here show evidence of having been exposed to heat. In certain cases a charred crust (presumably consisting of food residues) has developed. It has been previously understood that cooking starchy masses or pastes could destroy starches, albeit that recent studies have demonstrated dissimilar levels of starch grain preservation (Henry et al. 2009; Zarrillo et al. 2008; Chandler-Ezell et al. 2006). Nonetheless, the present study has yielded well-preserved and identifiable starch grains together with heavily affected starch grains recovered from the ceramic artefacts related to food preparation or cooking.[232]

It has also been demonstrated that cracks and pores in used surfaces of lithic tools acted as protective spaces with regard to starch grains when exposed to characteristic taphonomical processes in buried contexts (Loy et al. 1992; Pearsall et al. 2004; Piperno and Holst 1998). These cracks and pores also allow the adequate protection of starch grains from those occasionally aggressive processes of washing and curating archaeological materials during field and lab work. Therefore, starch grains trapped in lithic artefacts area easily related to human activities as described in the present study.

9.8 The site synthesis

The pre-Columbian site of Cimetière paysager Poncel is situated on top of a small foothill, located to the northeast of the dominating Mont Cabassou. An important, draining creek runs at the foot of these Cabassou foothills. Rising from the Methon Savannah near Vieux Chemin and flowing towards the Cayenne River, it represents a tidal acces into this swampy hinterland (cf. Figs. 9.1-2).

The Morne Poncel is ascribed to the Precambrian Shield of Cayenne Island which emerges diagonally (NE–SW) within the excavation perimeter (cf. Fig. 9.3). The soil at the summit represents a ferralitic soil *rajeuni*. Soilcreeping has been attested for the site, explaining the reason why the Precambrian bedrock is so close to the surface. In addition to artefacts, ancient human presence is also attested for by means of the dark colouring of the superficial layers, namely US 1000 and notably US 2000. However, we do not know if this can be attributed to the pre-Columbian occupation or to the colonial activities, but the former is highly probable.

The radiocarbon datings

A series of 15 charcoal samples and one taken during the mechanical survey suggest two pre-Columbian occupations within the excavated area. The youngest and most important occupation is dated between AD 900 and 1400 (N=13). Three results do not fall within this range. The most recent occupation (POZ-44829) can be ascribed to the Historic Period. The other two are earlier. POZ-44836 marks the beginning of the Holocene era, as it is too early and does not contain any archaeological material. The other date (POZ-44824), however, was taken from a deep pit associated with specific ceramic ware. It may indeed testify

232 For further reading on this subject, see Rodríguez Suárez and Pagán Jiménez (2008).

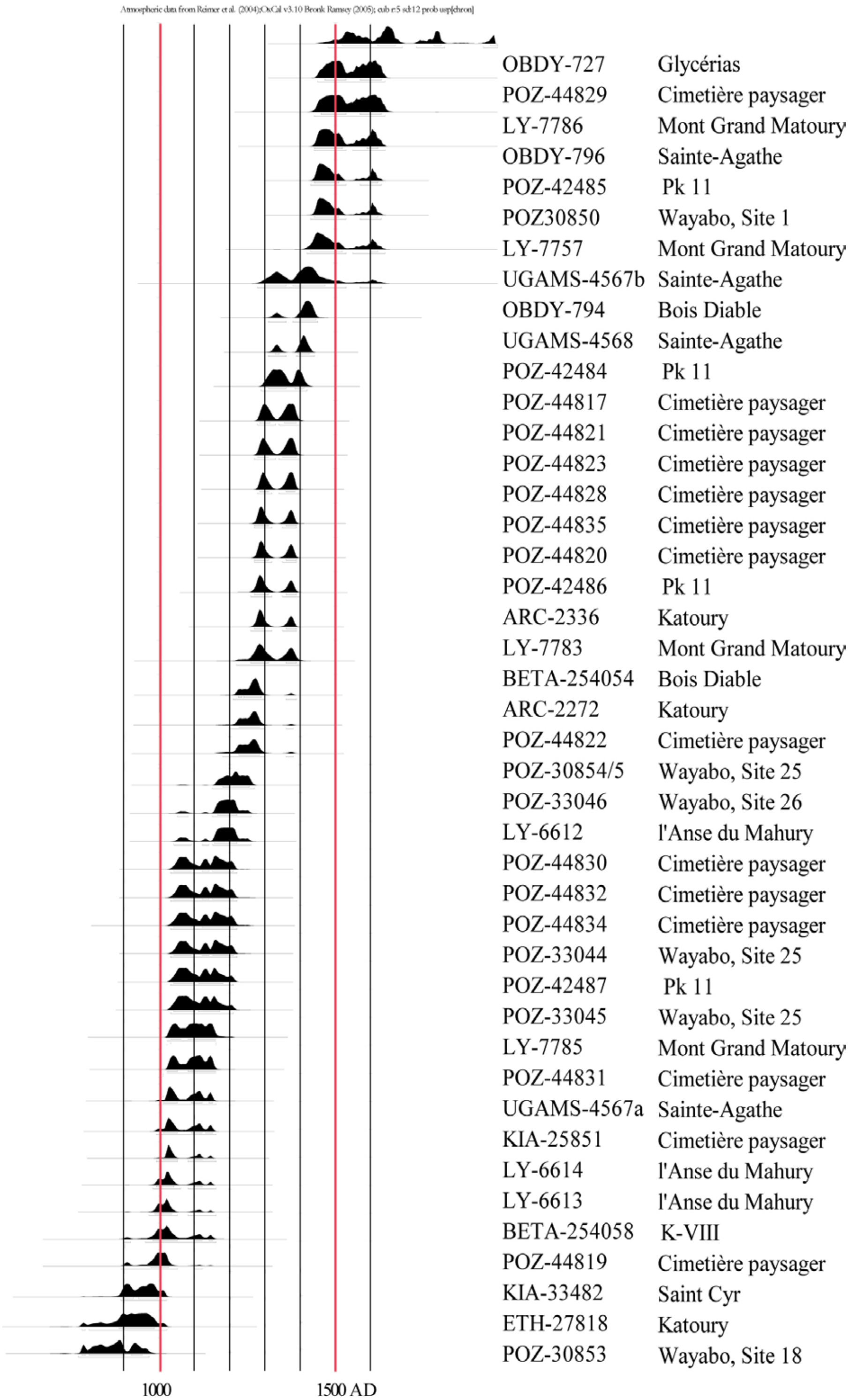


Figure 9.33. The radiocarbon dates related to LCA sites on Cayenne Island and its surroundings (cf .Annexe 1). Atmospheric data from Reimer et al. (2004), calibrated at 2σ with OxCal v3.10 Bronk Ramsey (2005).

an earlier occupation dating approximately to the 4th century AD. An important lesson can be learned here again (cf. Section 5.3): pre-Columbian sites were reoccupied after a (much) earlier abandonement.

When considering the correct radiocarbon dates with regard to the most recent occupation, one may say they refer to the Late Ceramic Age, presently dated between AD 900 and 1500. As we have mentioned previously (cf. Section 8.8), this era is the most frequent age not only for Cayenne Island, but also for the entire western coastal zone of French Guiana (Fig. 9.33).

The occupation of the coastal plains after 1200 BP is often regarded as the result of migration from the west (Rostain 2008b:293) and not as a natural indisponibility of the region because of marine transgressions (van den Bel et al. 2014:213). This implies that a possible occupation of this coastal plain may have been the result of people moving from the interior towards the coast shortly before AD 1000 when the majority of the radiocarbon dates is recorded. The lack of earlier sites for this area and notably Cayenne Island is probably one of the reasons for the popular migration hypothesis.

Aristé on Cayenne Island?

The radiocarbon date of pit F 158 as well as the ceramic content may indeed open innovative perspectives concerning the first, important occupation of CPP and the ECA in general. This large, deep, cylindrical pit yielded ceramics with a very sandy paste, consisting of restricted carenated vessels with precisely executed vertical parallel incisions on the exterior, upper wall and the open bowls with flaring rims. It also features rim fragments with a continuous series of indented fingernail incisions on the inside of the rim and/or on the lip which is defined as the ceramic type *Ouanary encoché* (Rostain 1994a:161–173).

At that time, Rostain proposed a calibrated range for *Ouanary encoché* dated between AD 350 and 850 (Rostain 1994a:173). This corresponds rather well with CPP as it does with the other sites where this specific ware was found. Moreover, *Ouanary encoché* was attributed to the Early Aristé Phase as well as to the Amazonian Incised-and-Punctate Tradition. It goes on to receive Polychrome influences and transforms into the Late Aristé Phase (Rostain 1994a:434–435, 437). Recently, for some reason, Rostain proposed another chronology with regard to Aristé, to wit: (a) Early Aristé (AD 700-1100), (b) Late Aristé (AD 1100-1600) and (c) Final Aristé (AD 1600-1750) (Rostain 2011, 2012:24).[233]

As to Table 9.9, it is suggested here to retain the early dates as to Early Aristé and define *Ouanary encoché* as a ceramic ware predating the polychrome Late Aristé ware. Although further research is required, it may be obvious that these Ouanary sites can be considered as multicomponent sites, when taking the radiocarbon dates into account. Thus, instead of classifying this incised ware to: (a) the predominantly LCA Incised-and-Punctate Tradition and (b) to a Polychrome Tradition, it would be equally appropriate to attach *Ouanary encoché* to the contemporaneous earlier Incised-rim Tradition with regard to numerous stylistic analogies occur (Gomes 2011:280, Fig. 2a).

As a matter of a fact, this ware is found in several other first millennium dated contexts, notably (ring-) ditched sites (e.g. Favard, Pointe Maripa, Blondin) which have been excavated between Cayenne Island and the Oyapock River. This tentative cultural zone is possibly the counterpart of the ECA ware of CSL Phase 2 near the Maroni drainage. The small carenated bowls in both ceramic complexes

233 Remarkably, in a prior publication, Early Aristé starts *at c.*AD 600 (Rostain 2011b:14).

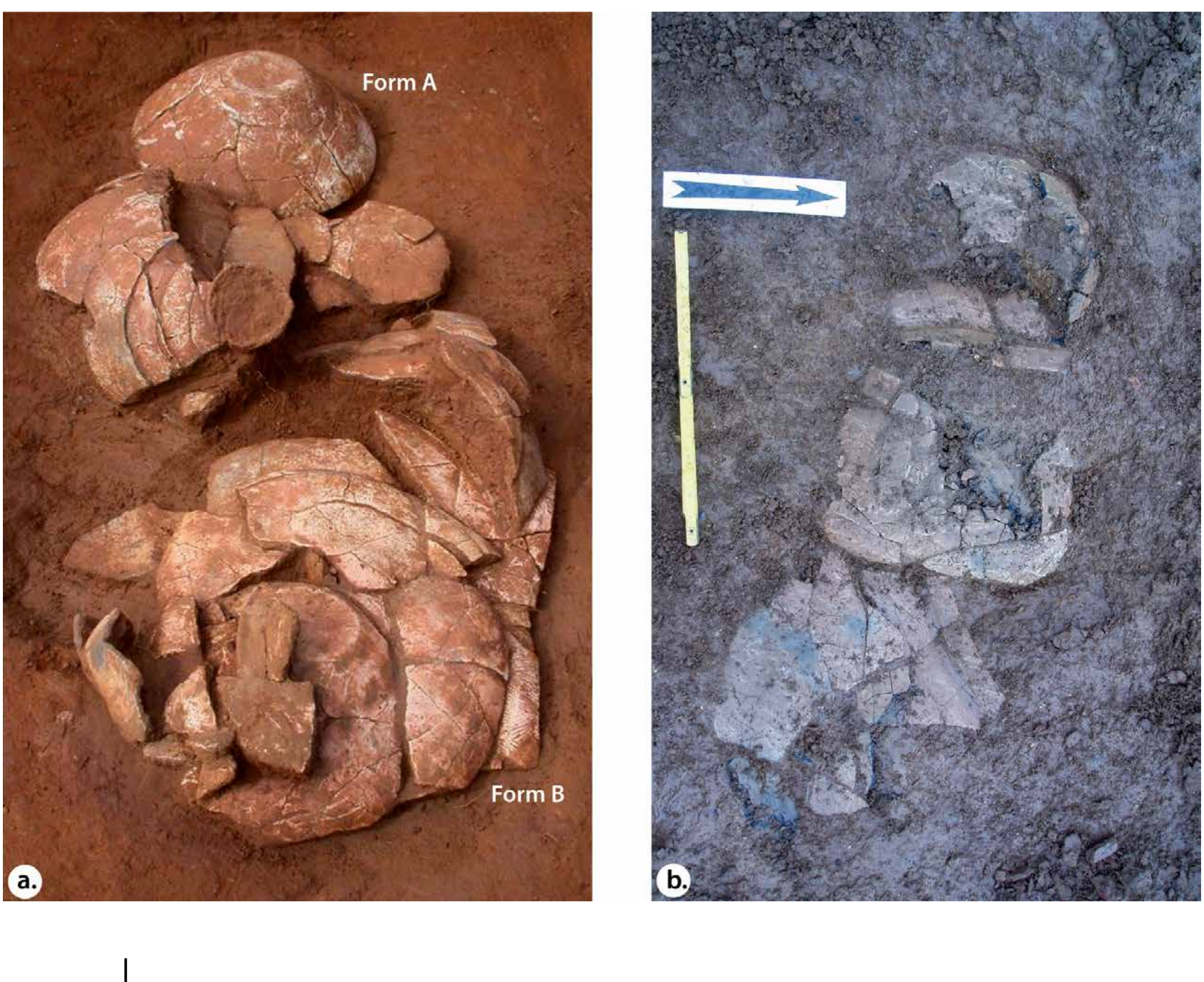
may present a larger Early Ceramic Horizon with regard to the interior of French Guiana (cf. Fig. 3.2). This hypothesis requires further testing in the future.

Nonetheless, it is evident that the ECA slowly, but surely, manifests itself on Cayenne Island. This indicates that whenever any archaeological research makes progress, discoveries can still be made, even in areas thought to be better known than others. Could this be the case with numerous table mountains on Cayenne Island? As demonstrated, Cayenne has apparently earlier ties with eastern French Guiana than merely the late LCA Polychrome influences observed in the Thémire complex as was previously thought (Rostain 2011b:23). CPP also indicates that numerous other sites on Cayenne Island are probably multi-component sites. This makes us aware of the fact to remain open-minded when it comes to unravelling the origins of LCA complexes: an earlier local tradition is present.

The LCA features

The LCA is the dominant occupation of this site. It covers the entire excavated area as attested for by means of the features, similar ceramic wares and radiocarbon dates. The dark earth as well as the various anthropogenic features are presumably the reflection of a site with a central habitation zone situated at the summit and several smaller secondary locations, perhaps activity areas (cf. Fig. 9.9). On the one hand, the numerous radiocarbon dates did not enable us to distinguish a chronological order among the activity areas. On the other hand, the site's surface

Figure 9.34. (a) An elongated pit with ceramic debris as observed during the mechanical survey of Katoury (photograph by Sylvie Jérémie). One easily recognizes Forms A and B; (b) A photograph of a ceramic deposition at the allotment project l'Anse du Mahury (No. 97309.137), taken when the present author visited this site during its destruction. Three radiocarbon dates yielded a calibrated date at 2σ between AD 990 and 1215 as to the excavated area (Briand 2012b:26).



and meager quantity of features suggests a less important occupation. However, the relative abundance of milling stones emphasises the possibility that this site represents a secondary persistent habitat, or satelite site, of a much larger habitation site (e.g. Katoury, Vieux Chemin, Rorota). Apparently, many generations of the same population visited it year after year.

The question of the elongated pits being inhumation pits is of importance to the habitation issue too. Despite the fact that we did not find any eggs of paleoparasites in the pit fill of F 199, this type of pit was found in three distinct areas: Zones A, C and D. Our field observation recorded an elongated pit with rounded corners yielding ceramic debris. This ceramic content consists of complete vessels or voluntary broken ones and depostited vessel fragments, perhaps referring to ritually broken or killed ceramics.[234] The general composition of these features as well as the pit's outline (*c.* 170 x 50 x 30 cm) probably reflects a human body in stretched position, covered with broken potsherds. Next to it, complete vessels were placed at the feet or next to the head. It is suggested here that the ceramics cover the body or help to weigh down the leaves, or any other material, covering the body. The ceramics may also have served as a marker in order to indicate the pit of the deceased in the (abandoned) village as to remembrance, a tradition many Amerindian groups of South America (Métraux 1947; Viveiros de Castro 1995:13) and the Guianas (Roth 1924; Rostain 2011a; cf. Annexe 4) still practice today. The absence of human bones, however, is an issue as to a secure identification. Further microscopic or chemical analysis must be carried out in order to confirm the presence of human bone in these pits.

Despite the lack of bones, we must evoke the significance and large quantity of such elongated pits with numerous ceramics found at other LCA sites on Cayenne Island since the introduction of compliance archaeology. They were recorded for the first time during the mechanical survey conducted at the large habitation site of Katoury (Jérémie et al. 2002) (Fig. 9.34a). We may furthermore note: (a) the habitation site of Saint-Cyr (the survey and programmed excavation at Chennebras as well as the survey at Kreola Parc), (b) the excavated "elongated pit-site" of Mombin II, south of the Mont Mahury and (c) the excavations at Stoupan Ecolodge near the Comté River.[235] Other sites, such as Suzini (construction Conseil Régional) or l'Anse du Mahury (personal observations 2005 and 2007; Briand 2012b) presumably featured similar pits too (cf. Figs. 9.2 and 9.34b). We may conclude that these pits are a recurrent phenomenon on Cayenne Island and that they may certainly represent cultural markers with regard to the LCA of Cayenne.

The programmed excavations at Chennebras as well as compliance excavations at Mombin II showed a specific spatial organisation of these elongated pits. Albeit orientated in various directions, between four and five pits formed a small entity or (burial) group. These groups are perhaps aligned or spatially organised otherwise. At the large habitat sites of Katoury and Saint-Cyr, these pits are probably located at the periphery of large house locations, as a small number of postholes were found near these pit clusters.

234 See also note 180.

235 All operations have been conducted by Sandrine Delpech (2010a, 2010b, 2011a, 2011b) except for the programmed salvage excavation at Chennebras conducted by Fabrice Lavallet in 2012. More recently, the LCA Mombin 3 site at Cayenne Island yielded additional "burial" pits with ceramic debris (Mestre 2015).

At CPP, we can also presume a spatial organisation when designating the N-S alignment of three elongated pits as to Zone A, i.e. F 193, F 201, F 18+33. However, these are single pits and not clusters. This fact may reveal a possible difference in site-function in which the Pleistocene sand bar sites (e.g. Katoury, Vieux Chemin, Suzini, Saint-Cyr) are the larger habitation sites whereas contemporaneous sites (e.g. CPP) are seasonal or satelite villages in view of producing dough or maize flower for example (cf. Section 12.5.2 for a further discussion on this subject). The various ceramic depositions in the same Zone A, i.e. F 13, F 54, F 83, F 85, evoke another burial mode in single or "double" vessels (e.g. funerary or ceremonial). It appears to be contemporaneous, but may constitute diachronic and/or coexisting burial traditions. Indeed, if the white-on-red, keeled vessels represent burial urns, they may refer to a shift or local development in the latter half of the LCA, suggesting the introduction of yet another burial tradition (e.g. Sainte-Agathe).

In addition to a possible secondary burial mode –although we did not come across any (human) bones in these recipients (cf. Section 7.2)– a rite of passage is also possible. For example, among the contemporary Wayana the placenta (*uponpë*) is buried in a small pit (Hurault 1968:54) dug at a small distance from the house. However, if the child-birth takes place during the night, the placenta may be buried next to a posthole of the house (Chapuis 1998:309). Thus, various types of ceremonial burials are imaginable. Another option, i.e. a secondary burial, can be illustrated by means of an example recorded among the early 19th century Palikur who placed the bones of the deceased in a ceramic vessel or urn (Fauque 1835:8, cf. Section 7.4 for this quotation). We repeat that these analogous examples, from a direct historical appraoch (cf. Section 10.5), are forwarded in order to provide alternative perspectives regarding these types of features. Nevertheless, it is assumed that while the LCA various modes of interment coexisted along the coastal of French Guiana at Awala, Iracoubo, Wayabo, Cayenne and the Oyapock, each group or family possibly followed their own mode of burial practices concerning specific occasions reflecting their characteristic cosmovisions concerning death and the afterlife.

The LCA on Cayenne Island

The large majority of the ceramic assemblage can be attributed to the LCA. Only a small portion is much earlier, as pointed out above. Of the CPP ceramic assemblage, at least 51% of the decorated register was incised whereas 38% is (red) coloured and 7% displays modelling. The former consist of parallel, vertical or oblique incisions, often crossed, called *treilles*. In general, the latter incisions are, notably with regard to Form A, applied in a "messy," or less esthetical, manner to the exterior upper part of the vessel. This resonates a quite rapid production of these slightly restricted and mainly boat shaped vessels. Another mode, the alternating incisions, resembling crossed hair, –if we consider vessels to represent humans (personification) and the upper part represents the head–, is often better executed as are the wavy-lines. Both are outstanding markers for this assemblage (Forms B and E). Red colouring is added to the inside and outside of vessel. It may also appear in a zone or red "band" around the neck, often associated with neatly applied *treilles* or alternation of incisions (Form C). All these vessels may include small modelled appliqués, usually nubbins, small clay strips or even small *adornos* on the lip, neck or shoulder.

Considering the radiocarbon sequence and typology (cf. Fig. 9.21), we observe that the dated ECs display a variety in vessel shapes through time. This renders it difficult to interpretate as they stem from dissimilar types of features. On the other hand, the decoration modes are rather persistent, notably the clay-strip applications, the incised wavy-lines and the red paint on the interior of the small bowls. We may suggest the potters have an original style and rich repertoire with regard to vessel shapes. The most common ones as to CPP and PK 11 were recognised, thus providing important elements for an LCA catalogue for Cayenne Island.

As to the LCA occupation of CPP, we proposed five distinct, grog tempered forms (Forms A-E). They were drawn from the eight modals series we recorded for this assemblage (cf. Section 9.5.4). Three of these forms (Forms A-C) are shared with PK 11, revealing in total six forms for both sites. They are contemporaneous, notably during the first half of the LCA, sharing many morphological and decoration traits (cf. Figs. 9.16-7). It is presumed that PK 11 Form D and CPP Form D (featuring polylobed rims and white-on-red painting respectively) are part of the latter half of the LCA occupation at these sites. In fact, the CPP and PK 11 ceramic assemblages share similar modal series and forms. More importantly, they present the same unmistakeable artistic and technological style –hereby following Roosevelt's description of style and tradition (1997:87–88)– as recorded at numerous other sites on Cayenne Island and the adjacent environment since compliance archaeology found its way in French Guiana from 2002 on Cazelles (2002), Jérémie et al. (2002), Hildebrand (2004, 2005a), Casagrande (2005), Mestre et al. (2005), Mestre (2006a), van den Bel (2007c, 2007d), Delpech (2010a, 2010b, 2011a, 2011b), Briand (2012b), Sellier-Segard (2013), Mestre (2014, 2015). Further morphological and technological ceramic comparison has not been conducted by the present author, but is now pursued by Matthieu Hildebrand (INRAP).

In 1985, Alain Cornette dubbed his specific Cayenne Style as 'Style Pointe Gravier' (Cornette 1990:201) as mentioned before (cf. Section 3.4.3.2). Rostain put this term aside and renamed it Thémire complex in his 1994 PhD dissertation. However, the Cayenne Style is easily recognisable in previous publications which include ceramic inventories (Turenne 1974, Petitjean Roget and Roy 1976, Cornettte 1988d, Rostain 1989, 1994a, Wack 1990a, Briand 1997, 1998). However, it has not been associated with radiocarbon dates yet, knowing that the sole Pointe Gravier date is too early. The Thémire complex had been dated to the very late LCA, i.e. AD 1400-1600, with only two shell samples taken outside Cayenne Island, i.e. the Bois Diable site near Kourou located on a Hoclone chenier. The reason for this is that the charcoal samples taken from sites at Cayenne delivered too recent results to be linked to a pre-Columbian age (Rostain 1994a:28, Table 2 and p. 29, Table 3).

The reconnaissance of the Cayenne Style, or Thémire complex, was established here in order to evidence and provide a cultural border with western and eastern French Guiana, notably between the Barbakoeba and Aristé ceramic styles. The Thémire complex is now better radiocarbon dated than 20 years ago. It can now be allocated between AD 900 and 1400, thus prior to the accepted Thémire dates, if we consider red-on-white painting as a main characteristic (Rostain 2013:122). In fact, as pointed out in the Chapter 8, the varied Thémire types are too heterogeneous. They are in need of a revision in order to define a catalogue of grog tempered vessels (*Cayenne peint*), as proposed here for CPP and PK 11.

However, one must not forget that the LCA of Cayenne Island may indeed have two phases, i.e. an early and late LCA phase, as pointed out by means of the radiocarbon dates in combination with possible climate changes (cf. Section 8.8). The radiocarbon dates and ceramic material from other excavated sites, such as the more recent Saint-Agathe and earlier Mombin II sites (Wack 1990b; Rostain 1994a:28; Casagrande 2005; Samuelian 2009; Delpech 2011a, 2013), comfort this hypothesis. The appearance of innovative ceramic series (toric pots and polylobed bowls; PK 11 Form D, CPP Form D), decoration modes (white-on-red painting) and possibly funerary practices (from elongated pits to double urn burials) towards AD 1300/1400, mark the replacement or influences of the earlier LCA ceramic series (Forms A-C from PK 11, Forms A-C and E from CPP), i.e. the mixed Cayenne Style and Thémire ceramic complex, interpreted as the incoming Koriabo style (cf. 12.2.2). Similar changes have also been observed on the Oyapock River where Koriabo is taking over a Late Aristé burial ground (Mestre and Hildebrand 2011).