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ARTIGO

A DESCRIPTION
OF LATE ARCHAIC
ROCK-FILLED PITS
IN FRENCH GUIANA

UMA DESCRIÇÃO DE POÇOS
PREENCHIDOS COM ROCHAS
DO ARCAICO TARDIO
NA GUIANA FRANCESA

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ABSTRACT

The Eva 2 site revealed a Late Archaic occupation dated between 5000 and 3000 BP. The site is situated on top of a hill juxtaposed between the neo-tropical forest of the Precambrian Shield and the coastal Pleistocene savannahs in French Guiana. The occupation level is characterised by a dark grey coloured layer of 10-15cm thickness at approximately 1m depth and yielded quartz waste material, polished stone tools, and “incipient” ceramics. In and just below this layer, multiple rock-filled pits were encountered at Eva 2. These pits have been interpreted as food-processing ovens and proposed to be emblematic for the Archaic Period in French Guiana and maybe the Guianas in general.

KEY WORDS: cooking pits, Late Archaic Period, the Guianas

RESUMO

O sítio Eva 2 revelou uma ocupação do Arcaico Tardio datada entre 5000 e 3000 BP. O sítio está situado no topo de uma colina justaposta entre a floresta neo-tropical do Escudo Pré-Cambriano e as savanas costeiras Pleistocênicas na Guiana Francesa. A camada de ocupação é caracterizada por um estrato de coloração cinza escuro de 10-15cm de espessura a uma profundidade de aproximadamente 1m, e forneceu refugos de quartzo, instrumentos de pedra polida e cerâmica “incipiente”. Dentro e logo abaixo deste estrato, múltiplos poços preenchidos com rochas foram encontrados em Eva 2. Estes poços têm sido interpretados como fornos de processamento de comida, e propõe-se que sejam emblemáticos do período Arcaico na Guiana Francesa e talvez nas Guianas em geral.

PALAVRAS-CHAVE: poços preenchidos com rochas, Período Arcaico Tardio, Guianas.

GEOLOGICAL SITUATION

The Eva 2 site is situated on top of a bean-shaped white sandy hill representing an outcrop of the Precambrian Shield in the Pleistocene coastal savannahs, situated in the vicinity of Malmanoury, central French Guiana (fig. 1a). The summit measures 2.5 hectares and attains 26 meters above sea level. Only the northeastern part of the hilltop (0,51 ha) was excavated by members of Inrap during a 10 weeks rescue excavation¹.

In French Guiana, the white sand deposits are known as the Sables Blancs Détritiques de Base, in Guyana as the White Sand Series and in Suriname as the Zanderij Formatie. This formation is observed roughly between Kourou (French Guiana) and north-western Guyana. A dry ombrophile low forest grows on the sub-soils of this geological series which consist of coarse-grained quartz sand which may have originated from the grès formations in the meridian zone of the Guyana Shield (Roraïma-Kayeteur). However, the deposits near Saint-Laurent-du-Maroni are probably the result of a local weathering of volcanic rock (Blancaneaux, 1981:24-25).

On the flanks of the hill, two submerging pegmatite veins were observed; one situated WNW-

ESE and the other one SW-NE (fig. 1b). These pegmatite veins consist of quartz, feldspar, mica (white or black) and tourmaline. The feldspars have weathered completely and what has remained is merely quartz and tourmaline. In fact, these pegmatites are very rich in quartz (approximately 75 to 80%) and the deterioration of the feldspars weakens the veins and finally disaggregates them. Tourmalines and micas subsequently deteriorated and washed out by weathering which has resulted in almost pure quartz sand or

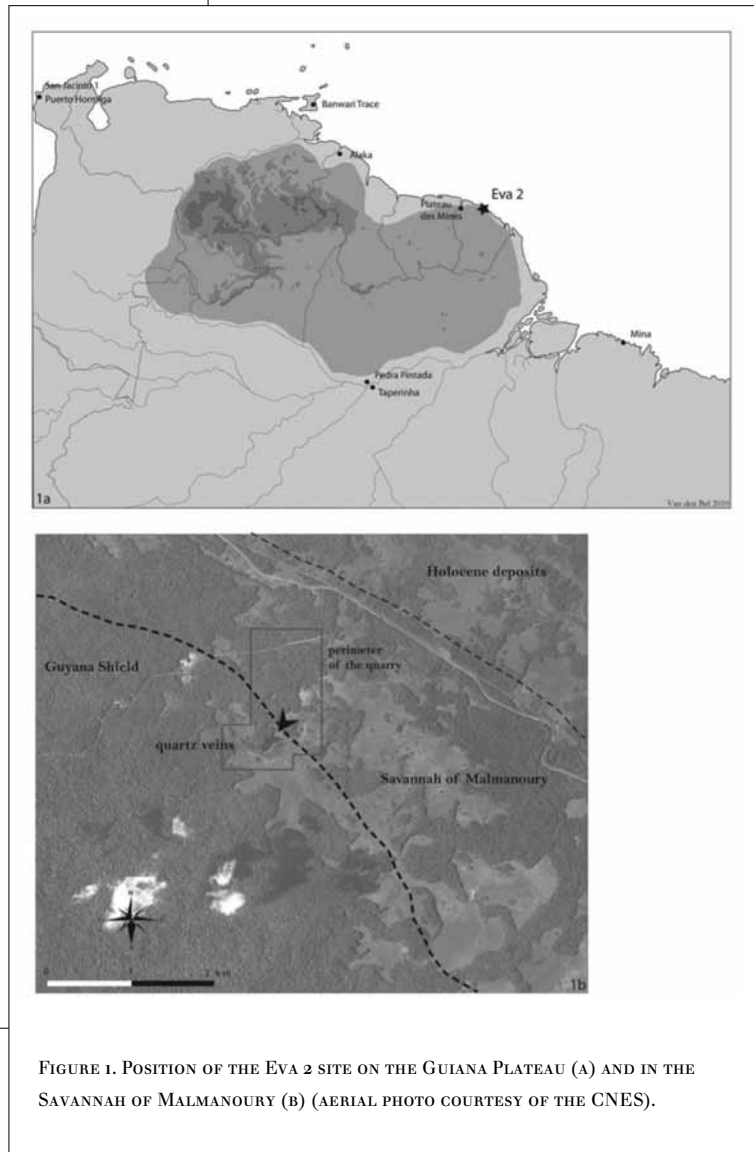


FIGURE 1. POSITION OF THE EVA 2 SITE ON THE GUIANA PLATEAU (A) AND IN THE SAVANNAH OF MALMANOURY (B) (AERIAL PHOTO COURTESY OF THE CNES).

arena. These veins probably provided the archaic Amerindians with raw quartz material and hence represent probably one of the most important factors for human occupation at this site.

The archaeological layer is embedded at approximately 1m depth in a so-called 'giant podzol' which probably started to develop at the beginning of the Holocene. The pedological profile is fairly similar to other white sand hills: it is superimposed by a black humic A-horizon with rootlets (US 1). At Eva 2, this layer is underlain by a (recent) Amerindian occupation level, evidenced by an anthropogenic layer (US 2). The next layer is a brownish yellow layer, which is usually absent at the highest parts of the site and marks a sterile transition zone (US 3). Below this layer, the older archaeological level is found: a dark grey layer of approximately 10 to 15cm thickness containing abundant lithic

artefacts, charcoal and some weathered pottery (US 4). This paleo-sol corresponds to a dwelling level and represents an archaeological refuse layer (fig. 2). This layer is found on top of a sterile white sand stratum having at least 2 meters in thickness (US 5) before touching the non-bleached red clayey sand.

ARCHAEOLOGICAL RECORD

The Eva 2 site was excavated on feature level. First the recent Amerindian layer was excavated and subsequently the lower archaic level. The transition layer (US 3) was removed by means of a mechanical shovel revealing the top of the archaic level. Now, the archaeological layer was removed by means of a mechanical shovel in thin layers of 1 to 3 centimetres. While "scraping" the archaeological layer the artefacts were collected manually in regular units and eminent objects were registered

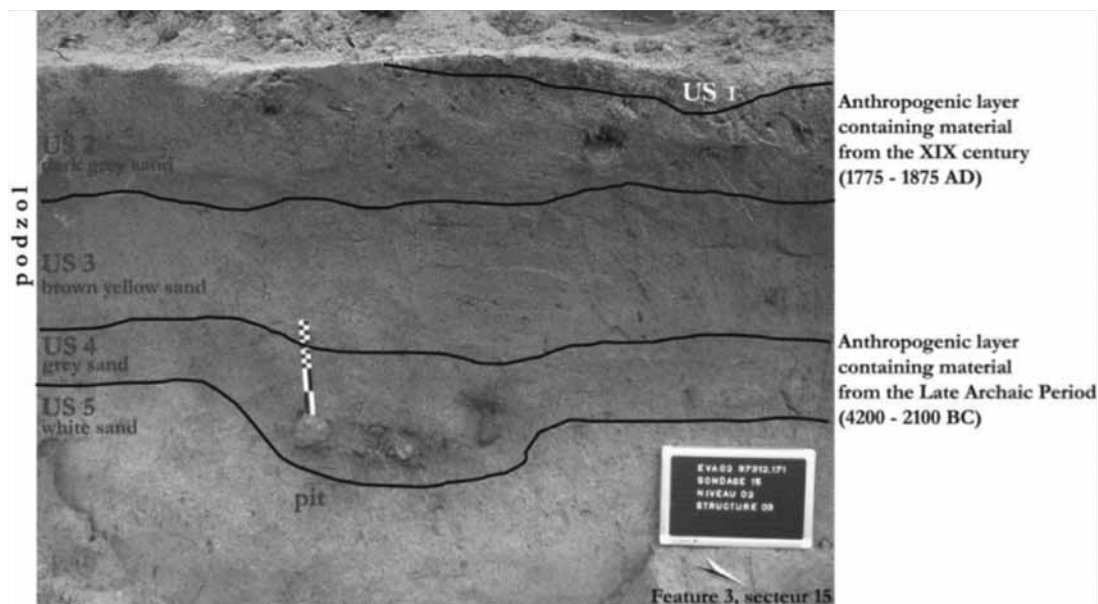


FIGURE 2. SECTION OF A ROCK FILLED PIT.

2 The preventive archaeological excavation of sites by means of mechanical shovel is fairly common since the 1970's in France as well as Western Europe. Methodology and techniques used in preventive archaeology are different from traditional ones and have been introduced in French Guiana during the Petit-Saut Project in 1993 (Vacher et al. 1998). The author recommends *La fabrique de l'archéologie en France*, edited by Jean-Paul Demoule and Christian Landes (*La Découverte* 2009) for more information on preventive archaeology in France.

using a theodolite². A small part of the archaeological layer was sampled, at a random chosen area, in order to obtain smaller lithic artefacts. Excavation pit 12 was dug in 76 squares of 1x1m which were dug in three arbitrary layers of 5cm (cf. fig.

3a). The sediment of each square was sieved per layer in the field over a 0,5cm mash and yielded over 3000 quartz flakes and 9000 pieces of debitage.

In total, five AMS dates were performed on charcoal samples, four of which were

taken from the content of quartz clusters and one was taken from a non-defined layer during the diagnostic phase in 2004 but may represent the final phase of the occupation (KIA-26,019) (Table 1 and fig. 3b)³. The result of the sample taken from Feature 23 (ETH-31,230) is considered to be too young and has to be discarded. The other samples are considered to be correct and reflect an occupation between 5150 and 3025 BP. This fairly large time span suggests an occupation of two thousand, or at most three thousand years. The KIA-27,630 sample also yielded a date for the ceramics found in the same rock feature (3690 BP). This younger date surely stresses the large occupation span of the site but also represents the “introduction” of pottery during the occupation of the site in the very late archaic times.

The C14 dates themselves are believed to be

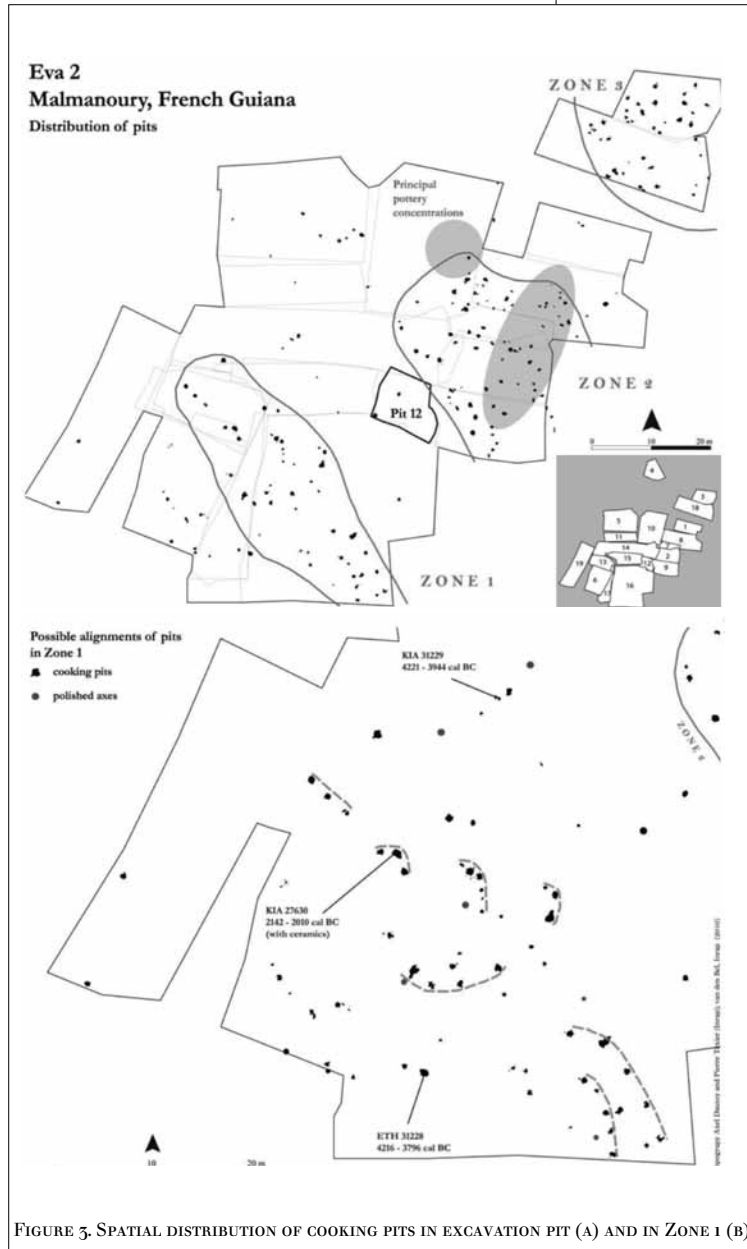


FIGURE 5. SPATIAL DISTRIBUTION OF COOKING PITS IN EXCAVATION PIT (A) AND IN ZONE 1 (B).

3 Unfortunately, 16 thermoluminescence “estimations” performed on the temper of the early ceramics and the fire-cracked quartz rocks by Archeolabs (France) did not yield satisfying results due to methodological problems.

TYPE	C14 AGE BP	CALIBRATED DATE 20 BC	LAB N°
LAYER	3025 * 20	1290 - 1263	KIA 26,019
QUARTZ CLUSTER WITH CERAMICS	3690 * 25	2142 - 2010	KIA 27,630
QUARTZ CLUSTER	5125 * 50	4221 - 3944	ETH 31,229
QUARTZ CLUSTER	1775 * 45	AD 132 - 381	ETH 31,230
QUARTZ CLUSTER	5150 * 55	4216 - 3796	ETH 31,228

TABLE 1. RESULTS OF THE C14 DATES (CALIBRATION AFTER STUIVER ET AL. 1998; RADIOCARBON 40).

correct but one must be aware of taphonomic processes and paleo-fires in the neo-tropics. Geomorphologic research and numerous isotopic dates show that the Amazonian forest has known multiple climatic changes revealing an alteration of humid and dry periods since the end of the Pleistocene. The latter periods encouraged fires which affected large areas of the tropical forests, witnessed by large quantities of charcoal in the tropical soils. For example, nearly 150 radiocarbon dates taken during the archaeological rescue program of Petit-Saut revealed multiple distinct phases of paleo-fires for French Guiana (Vacher et al. 1998:76; Tardy, 1998:246). The latter have resulted in enormous quantities of charcoal, which (could) have been mixed with the archaeological layer. Whether these fires are the result of human activity or of natural events is at the moment a subject of scientific debate (Carcaillet et al. 2002; Araujo et al. 2005; Iriarte 2006).

GENERAL DESCRIPTION OF THE QUARTZ CLUSTERS

Next to the masses of lithic debitage, polished tool and incipient pottery, the excava-

ted area of the Eva 2 site also revealed over 200 quartz clusters (fig. 3a). This paper will continue to present the empirical evidence concerning these cluster pits and their possible interpretations⁴.

Almost all blocks are quartz (99%) and show cracks due to thermal shock. They measure between 5 and 20 centimetres and do not show any sign of flaking and have probably been extracted from the nearby submerging pegmatite veins. In most of the cases, the quartz stones were deposited into a shallow roundish pit with a maximum depth of 30 centimetres, revealing a sink-shaped outline (fig. 2). In other cases, we could not distinguish a pit contour and we suggest that the rocks were just put on the surface. Within the pit, the distribution of the blocks sometimes appeared in several layers of blocks which may be an indication for an internal organisation (fig. 4a).

The clusters are considered to be single features since only 6% of the features are overlapping with other rock clusters. The latter fact may suggest that the location of these rock features was visible or even marked on the surface. Their sizes

⁴ The results of the lithic and ceramic analysis will not be presented in this paper but will appear in a future paper together with the results of another archaic site from French Guiana (cf. Mestre and Delpech, 2008).

It has to be stated that neither one of the three zones was fully excavated.

vary between 30 and 90cm in diameter with an average of 54 centimetres. The majority of the clusters feature a ‘hole’ or empty space in the middle revealing a donut or hoof shaped outline. This variety enabled us to deduct four morphological shapes or types of clusters by defining the shape, size and manner of arranged blocks: (1) clusters with an organized and defined shape (round and square) of any size; (2) clusters of Type 1 but with an ir-

or batteries : alignments consist of four to six rock clusters in linear and/or crescent partition (fig. 3b). Furthermore, the excavated area could be divided into three distinctive zones which were showing a high density of clusters (fig. 3a). These zones tend to be situated on the highest central part of the hill top and each consists of approximately 70 clusters. Outside these three zones a few (isolated) clusters and various axe deposits were located⁶.

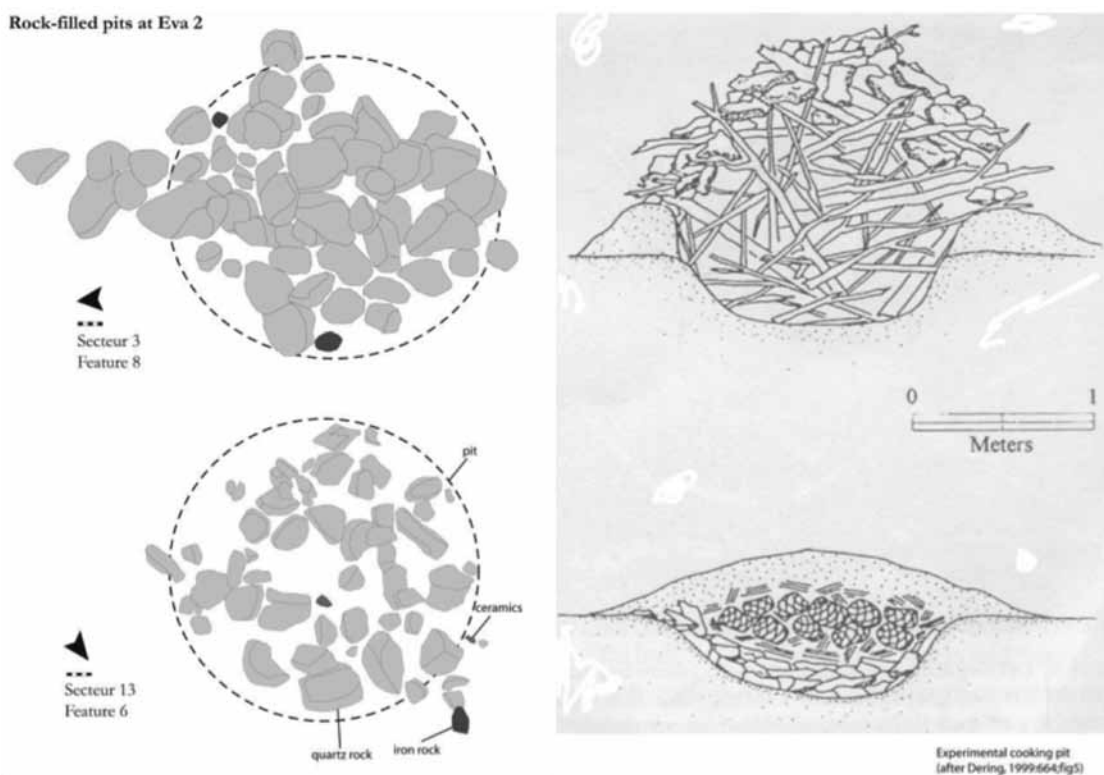


FIGURE 4. ARCHAEOLOGICAL ROCK-FILLED PITS AND EXPERIMENTAL COOKING PITS.

regular and a scattered side (25 to 50%); (3) clusters with a horseshoe shape; and (4) irregular clusters⁵.

During the fieldwork we already observed that several clusters formed alignments

The sieving of the sediment taken from the rock clusters yielded little results. Very small quantities of carbonized material from the pit fillings were detected and it is highly probable that possible residues have

⁵ Note: cluster types 1, 2 and 4 may also have ‘holes’ in the middle.

⁶ It has to be stated that neither one of the three zones was fully excavated.

disappeared by the extensive leaching in these coarse-grained white sand deposits.

Next to the quartz blocks, some clusters also contained fragments of iron nodules, 58 clusters contained fragments of pottery and only one cluster contained a polished tool (a bell-shaped grinding stone). The presence of ceramics in a cluster is not a diagnostic marker for a specific morphological type of rock cluster since ceramics are present in all shapes but Zone 2 did evidence a concentration of ten clusters with pottery (fig. 3a). In general, the variations in cluster morphology and / or cluster diameter do not able us to define a typical cluster pattern or alignment; on the contrary, they do not reveal much homogeneity but display a wide range of dimensions and different morphologies. This description concludes that the final stage of these clusters as they were encountered in the field reflect the abandonment after a certain way of using and re-using the rock-filled pits.

INTERPRETATION OF THE ROCK CLUSTERS

The discovery and their spatial distribution questioned primarily the function of these features. The excavations at Eva 2 clearly showed that a shallow pit was dug and filled with (pre-) heated quartz rocks (fig. 2). Whether a presumed content was already in the pit or put on top of the quartz rocks is unknown. Furthermore, it can be assumed that these pits and their content were covered with sand to enhance the cooking process. These observations may represent the construction and use of a cooking pit. Although geochemical or macro analysis of the pit content has not been performed until today, it is

assumed that these pits have been used to prepare food, such as meat, (shell) fish and/or tubers by hot air or steaming.

The various shapes of the rock fillings are representing stages of its use and the alignments of several pits may show evidence of a series of multiple cooking events at one moment. It is further believed that the aligned pits were probably operational at the same time and even may represent the result of several hunting parties during a (seasonal?) visit at the site. Hence, multiple alignments or one of the three particular zones may represent several visits of one band over a certain period of time⁷. The latter fact is another interesting element found at this site (and at the same time showing the interest of an extensive excavation). Three zones of rock clusters have been recognised which can be considered as (diachronic) activity areas. Although we have hardly any information on the spatial distribution of the quartz flaking zones, we do consider the pits and the refuse layer to be a kitchen area.

In conclusion, the large occupation span, the extended size of the site (2.5 hectares for the summit), the large quantities of quartz debitage and the three cooking pit zones found within the excavated area (0,51 hectares), may suggest a regular frequentation of this site by nomadic bands during the Late Archaic Period. Although the occupation span may seem rather large for (semi?) nomadic hunter-gathering bands, the pegmatite veins may have caused them to return to this hilltop often, indicating that this site was a favourable location that persisted through time⁸.

7 There is only one indication for an Archaic dwelling place in Zone 1: a distribution of several large blocks of quartz which constitute an area of approximately 40m² is observed in the middle of this zone at the central axis of the hill. Pit alignments are found at both sides of the possible dwelling zone which itself is "empty" of pits and may represent a house location (Fig 3a).

8 Recent research on settlement patterns of "Archaic" bands in north-western South America has shown strict cycles in specific areas or territories over long periods of time (Politis, 1996; Gnecco and Aceituno, 2004).

FOOD PROCESSING IN THE LATE ARCHAIC PERIOD

Although many archaic sites have been excavated in the Guianas since the 1950's, archaeological evidence of rock-filled features is absent. The presence of boiling stones or fire-cracked rocks in shell middens is thought to be the residue of cooking activities (eg. Williams 2003:127). Rock-filled pits may certainly have been used at these archaic sites in lowland South America but have not been recognized as such or have not been published (pers. comm. André Prous and Lucas Bueno; Chmyz, 1976:11,98; Prous, 1992:276).

Recently, rock clusters have been recorded at Salobó (Pará) and in southern Brazil but these features have been attributed to the Late Ceramic period (Imazio and Leal, 2006; Iriarte et al., 2008:9). In the Caribbean region, similar rock-filled features have been found in pre-ceramic contexts on Saint Martin (Red Bay), the Virgin Islands (Belmont) and the Bahamas (Three Dog Site)⁹. In north-western Colombia the Late Archaic site of San Jacinto 1, dated to the 6th millennium BP, revealed 112 clay-lined earth ovens (Stahl and Oyuela, 2007). The latter cooking pits revealed medium and small amounts of fire-cracked rocks. It is suggested that San Jacinto 1 site was a special-purpose settlement for foraging groups that logistically moved from base camps to special-purpose camps as they collected and processed plants and animals at the onset of the dry period in a highly seasonal tropical savannah.

Further away, in the United States, numerous excavations yielded similar features dating back to the very beginning of the North American Archaic Period. Rock clusters have

already been recorded for over a century during archaeological and ethnographic research. They have been interpreted as the fillings of earth ovens. In the literature, these cooking stones are often referred to as Fire Cracked Rocks (FCR's) and represent heated rocks for hot-rock cookery (cf. Dering, 1999; Thoms, 2003; 2009). Within the last few decades, North American archaeologists have systematically studied cooking stones and their use and have concluded that these types of features are actually distinctive markers for the Archaic Period. The similarity between the cooking pits in French Guiana and the United States is striking and represents a plausible analogy for the South American rock-filled pits. As in the United States, rock-filled or charcoal-filled pits are very common in Europe and exclusive features for Mesolithic and (early) Neolithic sites (eg. Carozza et al. 2005).

In North America, the relationship between foods and cooking-stone technology has been checked by ethnographic data and by experimenting with various roots such as squash, agaves, lilies, and bulbs. Alston Thoms (Thoms 2003:93-94) even suggested a working model for land-use intensification through time in which the archaic earth oven is a transition phase in cooking technology from direct cooking to direct boiling in a ceramic container.

His description of an earth oven is as follows: first a pit is dug in which a hot fire is built. Rocks are thrown and heated in this fire. When the rocks are hot (and wood reduced to coals and ash), a long wooden pole is used to 'arrange' the rocks in a circular layer (i.e. oven bed)¹⁰. Then a layer of green plant material is added to generate moisture/steam and protect the next layer from burning. Next, a layer of food is added, usu-

⁹ Information on these sites was discussed with Dominique Bonnissent, Peter Drewett and Mary Jane Berman during the IACA Congress on Trinidad in 2005. Gasson (2002) and Oyuela-Caycedo (pers. comm. 2008) confirmed the absence of Archaic rock-filled pits in both Venezuela and Colombia.

¹⁰ This action might explain the 'holes' present in the quartz clusters.

ally roots/tubers which require 24–48 hours of (steam) cooking due to complex carbohydrates. A second layer of green plants is added to separate the food from the sealing earth layer to hold a steamy heat (fig. 4b).

The Eva 2 site also yielded an ‘incipient’ pottery in the archaeological layer as well as in multiple rock-filled pits. One rock-filled pit with ceramics was dated 3690 ± 45 BP. The pottery is characterised by small open hemispherical bowls (12–15cm in diameter) with convex bases. Average wall thickness is 5 to 6mm and the paste reveals coarse (pounded) quartz particles that correspond to the incipient or Formative pottery found at the shell mounds of the Alaka Phase in north-western Guyana and to the ceramic complex of Mina in north-eastern Brazil (Williams, 1998, 2003; Simões, 1981, Roosevelt, 1995; Bandeira 2009).

As mentioned above, the presence of early ceramics at Late Archaic sites marks a shift in food preparation from toasting, smoking or steaming in pits to boiling food in ceramic containers (Thoms, 2003, 2009). The latest occupations of Eva 2 may indeed reveal that these Amerindians were combining and/or changing food preparation methods around the second millennium BC in French Guiana. Recently, during excavations at Saint-Louis on the terraces of the Lower Maroni River two charcoal filled hearth pits of which one pit was dated 3840 ± 35 BP (Poz-30956). This pit yielded coarse quartz tempered open vessels shapes (diameter between 30 and 34cm) with pointed round bases (Van den Bel et al., in prep).

FINAL REMARKS

Hitherto, the Archaic Period was considered to be present in French Guiana but never proven as such (Rostain, 1994:411). The Eva 2 and the Plateau des Mines sites,

both discovered in 2005, revealed finally the tangible evidence of archaic Amerindians in French Guiana. The latter site is situated approximately 100 kilometres to the west and some thousand years older (Mestre and Delpéch, 2008)¹¹. Just as in Trinidad, Guyana and northeastern Brazil, the sites in French Guiana are situated along or close by the former Atlantic coast but are apparently lacking shell mounds or sambaquis (Rostain, 2008:282–283). Both French Guianan sites are located on the White Sand formations and may suggest a particular relationship between this geologic formation and the (Late) Archaic occupation of the Guianas.

The primary activities at the Eva 2 site were quartz extraction, quartz flaking and hot rock cooking as evidenced by the submerging pegmatite veins, the large quantities of quartz debris and the rock-filled pits. Since rock filled features were hitherto not excavated in the Guianas, comparisons have been made with similar features found in North America also dating to Archaic Period, advancing an interpretation as cooking pits. Across western North America and in many other regions worldwide, these cooking pits are common and widespread and reflect a technology utilized by hunter-gatherers (cf. Dering, 1999; Thoms, 2009).

The extensive excavations at Eva 2 showed a spatial distribution of cooking pits in distinct zones and multiple alignments within these zones. The large number of cooking pits, their distinct spatial distribution and the radiocarbon dates may eventually put forward important information on archaic residential mobility, social organisation and economics. It is expected that different kind of tubers and plants have been cooked and / or steamed in these pits (and later in ceramic containers) and further

¹¹ The Plateau des Mines site evidenced different shaped rock clusters and lacked the presence of pottery (Mestre and Delpéch, 2008).

processed by grinding to obtain an edible pulp. Microscopic research is needed (and ongoing) to determine the species of phytoliths, starch grains and “fatty residues” found on the grinding tools. Finally, rock-filled pits, next to shell mounds, can be considered as key features for the Archaic Period in the Guianas and perhaps for other regions in lowland South America as well.

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