

## Bottle gourd seeds at Gallo-Roman "Le Bois Harlé" (Oise, France)

*This paper presents the preliminary results of the botanical research of 15 samples from 7 ditches and 8 wells at the Gallo-Roman site "Le Bois Harlé" (Oise, France), occupied from the first century until the middle of the third century AD. An important feature at this site was a large ditched enclosure divided into small plots, where horticulture is believed to have been practised. Botanical remains of several interesting species have been found, among which the seeds of *Lagenaria vulgaris*, the bottle gourd.*

### 1. Introduction

The site of "Le Bois Harlé" is situated in the village of Bois d'Ageux near Longueil-Sainte-Marie (Oise, France), on a marshy lowland (average altitude: 31 metres NGF) on the right bank of the Oise, 300 metres to the west of the present-day river (fig. 1). In 1988 and 1989 a total area of 12 ha. of this site was excavated. Since then a number of preliminary reports and papers have been published by the *Centre de Recherche Archéologique de la Vallée de l'Oise* (Vangèle/Dujardin 1988; Bonin/Vangèle 1989; Vangèle/Bonin/Valentin 1990). All the archaeological data presented in this paper were taken from these publications.

The "Le Bois Harlé" site is important because of the Gallo-Roman features which came to light here. The site was occupied from the first century until the middle of the third century AD. A striking feature found at the Gallo-Roman site was a large space surrounded by a deep ditch and internally subdivided by a series of shallow ditches. The orientation of the ditches within the large enclosed space was roughly NW-SE and SW-NE. They divided the terrain into small plots of land, the smallest of which measured 280 m<sup>2</sup> and the largest 1850 m<sup>2</sup>. The shape of the parcels varied from rectangular or trapezoidal to oblong and very narrow. The ditches, which had depths of 1-1.5 m in one of the later phases, definitely reached the level of the groundwater: their lower parts were probably constantly filled with water (Vangèle/Bonin/Valentin 1990, 127).

This extensive system of ditches within the enclosure cannot be seen as the result of an agglomeration of successive parcelling; it is the result of a methodical and rationalised organisation of a plot whose limits had been

fixed beforehand. The same phenomenon of planned parcelling is known from the Roman site of Rijswijk, De Bult (the Netherlands), where from the 2nd century onwards an entire domestic terrain was surrounded by ditches and the arable area was laid out in a regular pattern (Bloemers 1978, 46-54).

Other archaeological features observed at the site of "Le Bois Harlé" are the Gallo-Roman wells, fourteen of which were found on the terrain outside the enclosure and three inside it. The structures of these wells were in many respects the same. The fills of the wells consisted of two layers: the upper layer was sandy, the lower clayey. This lower layer had favoured the preservation of all kinds of organic material, such as fossil seeds. It was quite difficult to determine when the wells had been dug as the oldest layers of the well fills usually yielded few remains. Most of the wells had fallen into disuse between AD 175 and 230.

The method of construction and the dimensions of the structures on the site indicate that they cannot be interpreted as units of domestic habitations. The buildings must be seen as sheds, barns or stores, probably associated with the agricultural activities that were carried out at this site. The abundant amounts of household litter, ceramics and also worked wood (Bernard/Dietrich 1990) in the ditches and the pits, however, did indicate the proximity of an inhabited area.

The best information for determining the site's function dates from the second century and the first half of the third century AD, when the site's organisation was the most apparent.

Part of the complex was undoubtedly used for agricultural purposes (Vangèle/Bonin/Valentin 1990, 140-144). The ditches within the large enclosure extending to the level of the groundwater had been dug for irrigation (Bonin/Vangèle 1989, 102) or reclamation purposes (drainage of the arable land) (Vangèle/Bonin/Valentin 1990, 144). Small-scale intensive agriculture was presumably practised on the plots of land between the ditches. Whatever its main function may have been, we must regard the ditch system as a form of water management: the removal of surplus water from the land involves more or less the same techniques as the supply of water to areas where there is a

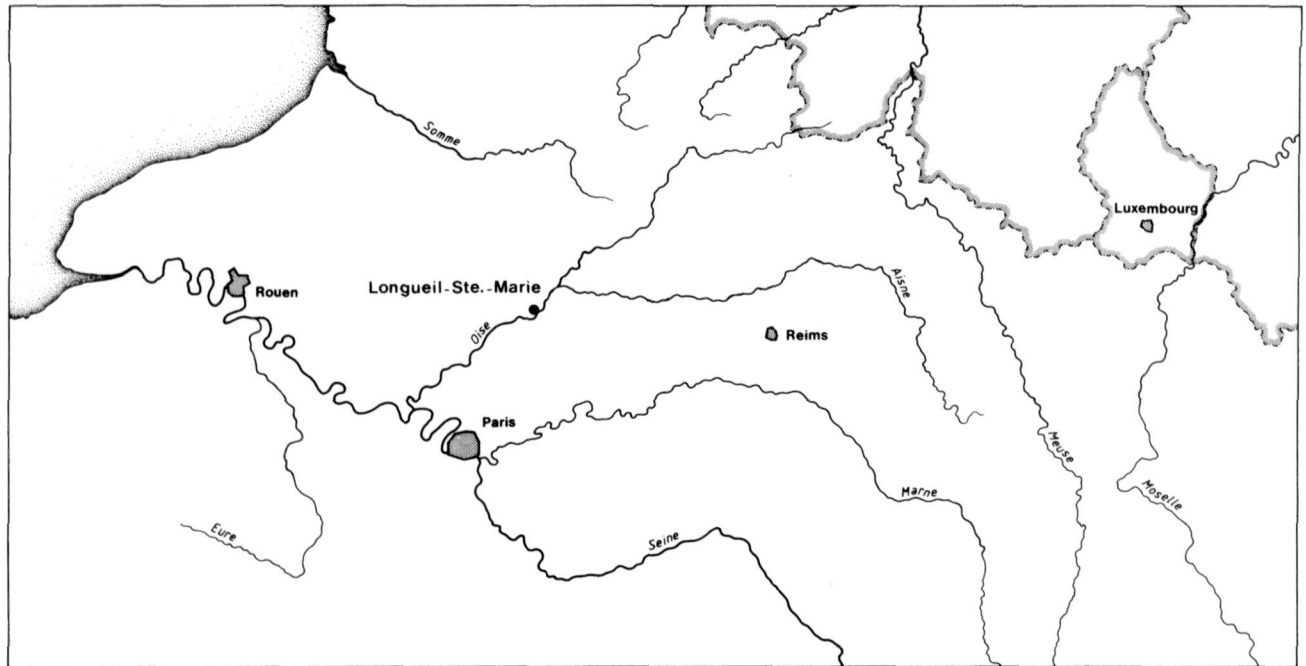


Figure 1. Location of the site "Le Bois Harlé", Longueil-Sainte-Marie (Oise), France.

natural deficiency. There is some evidence for similar enterprises in other parts of the Roman Empire, some of which involved both the protection of productive land from inundation and the profitable use of surplus water (White 1970, 146, 160). The ditches must have had an additional function as boundaries between the parcels. The fact that the enclosed areas were relatively small is in complete agreement with the assumption that a type of intensive *horticulture* was practised here.

## 2. Botanical research

Samples for palynological and botanical research were taken from features recommended by the French archaeologists, among which were some of the ditches and the wells. The high level of the groundwater in this valley, which has not changed since the Gallo-Roman period, had protected all organic materials, such as leather, wood and seeds, against oxygen and, as a result, the organic remains had been very well preserved.

A more detailed list of all the species will be published later, in a forthcoming paper dealing with the entire botanical research of Gallo-Roman Longueil-Sainte-Marie (de Hingh in prep.). Meanwhile some interesting results can already be presented here (tab. 1).

I already mentioned that the site of "Le Bois Harlé" had a principally agricultural function; this hypothesis had been

based mainly on the archaeological features, such as the field system of ditches and parcels mentioned above. The hypothesis that a so-called *polyculture* (proposed by Bonin/Vangèle 1989, 102) was practised on these parcels in the 2nd and 3rd centuries is supported by the range of cultivated species that was found in the botanical samples. It could be assumed that each single crop was grown on its own plot.

## 3. The bottle gourd

*Lagenaria vulgaris* (= *Lagenaria siceraria*)

An extraordinary find consists of two fragments of seeds of the so-called bottle gourd (*Lagenaria vulgaris*) or calabash, found in samples from two different Gallo-Roman wells. The first specimen was partly damaged, but the specific features were still clearly visible (fig. 2). The flattened, originally rectangular seed was grooved across its length on both sides. Two more or less parallel dark brown grooves ran over the shoulders like braces. The two 'ears' which are to be seen on present-day *Lagenaria* seeds had probably been worn down in the case of this specimen. The top of the seed was somewhat tapered. The seed wall (0.3 mm thick) was bicoloured; a very thin light-coloured inner layer and a thick, darker outer layer were distinguishable. Its measurements were: 8.5 mm × 6.3 mm × 2.9 mm.

The second specimen was only a small fragment, but still unmistakably of the lower side of a gourd seed, i.e. the

Table 1. Frequency diagram of the cultivated species of 15 samples taken from 8 wells and 7 ditches at "Le Bois Harlé".

species			number of samples
Cereals:			
<i>Hordeum vulgare</i>	Barley	orge	8
<i>Panicum miliaceum</i>	Millet	millet commun	2
<i>Triticum aestivum</i>	Bread Wheat	froment	4
<i>Triticum cf. dicoccum</i>	Emmer	amidonnier	1
Pulses:			
<i>Lens culinaris</i>	Lentil	lentille	3
<i>Pisum sativum</i>	Pea	pois cultivé	2
<i>Vicia faba</i>	Celtic Bean	vesce fève	1
Gourd family:			
<i>Cucumis sativus</i>	Cucumber	concombre	7
<i>Lagenaria vulgaris</i>	Bottle Gourd	calebasse	2
Spices:			
<i>Coriandrum sativum</i>	Coriander	coriandre	2
<i>Papaver somniferum</i>	Poppy	pavot somnifère	2
Others:			
<i>Beta vulgaris</i>	Beet	betterave	1
<i>Vitis vinifera</i>	Vine	vigne	3

point where the two dark grooves meet. Both seeds were from ripe *Lagenaria* fruits. The gourd is mentioned quite frequently in contemporary Roman literature. Roman authors like Pliny, Columella and Palladius give us detailed information about how and when the seeds are to be sown, about the process of growing and the different ways in which the fruits can be used. The unripe (green) fruits are edible — Apicius' cookery book contains many recipes for gourd — and in the autumn, when the fruits ripen and the pericarp becomes hard and thick (about 3 mm), the pulp dries out and the calabash can be used as a container for wine (Plinius 19.24.71) or other supplies, such as honey or pitch (Columella 10.385-7).

The presence of seeds of *Lagenaria*, a plant of tropical origin that is known to have been grown in the Mediterranean in these times, in this region in this early period is extraordinary. There is no consensus about the question whether the gourd was cultivated in northwest Europe at this time. Some believe that it is not possible that *Lagenaria* was ever cultivated or ever grew in northwest Europe; the chance of bottle gourd plants bearing fruit in our climate would have been very small as the plants can definitely not endure night frost (Kooistra/Hessing 1989, 172). Others are of the opinion that the fruits may well have ripened under our climatic conditions, but that the pericarp will never have hardened (Brouwer/Stählin 1975, 170). An experiment in northern Germany showed that in a hot summer *Lagenaria siceraria* plants can be grown outdoors

even in a town as far north as Hamburg (Stephan 1985, 154). We may therefore assume that under favourable circumstances (protected against the wind and cold) the gourd could have been cultivated even in the temperate climatic zone of northern France.

The gourd is known to require large amounts of water, of which it absorbs enormous quantities (White 1970, 153). This fact may be associable with the irrigation system and the large number of wells that had been dug at the site.

Only one other specimen of *Lagenaria* has so far been found in a Gallo-Roman context, namely at Mazières-en-Mauge (Maine-et-Loire, France). Here Marie-Pierre Ruas found a seed of *Lagenaria cf. siceraria* in a comparable archaeological context, in a well at an artisanal site. This bottle gourd seed has been dated to the second half of the second century AD (Ruas 1990, 35-8). In the Netherlands one example of a bottle gourd find is known. During the excavation of a well in early medieval Houten (province of Utrecht) fragments of the pericarp of *Lagenaria spec.* were found, which were dated to around AD 650-740 (Kooistra/Hessing 1989). No other finds of remains of the bottle gourd in northwest Europe are known to the author.

#### 4. Conclusion

We may assume that the Gallo-Roman site of "Le Bois Harlé" had an agricultural or, more specifically, a horticultural function. This assumption is based on the structure of the site as well as on the presence of seeds of

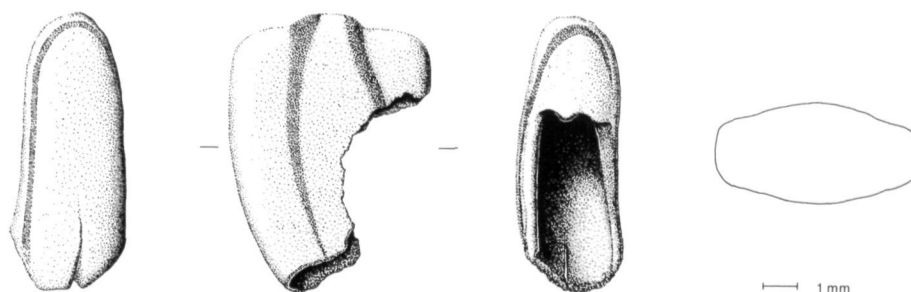


Figure 2. Seed of *Lagenaria vulgaris* (= *L. siceraria*, Bottle gourd) from a gallo-roman well. Scale unit = 1 mm.

e.g. *Coriandrum sativum*, *Papaver somniferum*, *Cucumis sativus* and *Lagenaria vulgaris* in the botanical samples from the site. It is even possible to assume that a polyculture was practised on the small plots within the ditched enclosure, which would mean that a different product was grown on each single plot. The differences in size between the fields could indicate this conclusion.

The presence of seeds of *Lagenaria vulgaris* (bottle gourd) in this region in this early period is noteworthy. There are several possible answers to the question how these two seeds ended up in the two Gallo-Roman wells. The seeds may have come from unripe or ripe fruits from the southern part of the Roman Empire, intended to be used as a vegetable or as a utensil, respectively. They may also have come from unripe or ripe fruits that were grown *in situ*. When we look at the main external features of the seeds we must conclude that the two seeds were ripe. This would mean that they came from fruits meant to be used as containers or bottles and made their way into the wells together with other domestic refuse, or from fruits that were used for obtaining sowing seed.

May we assume that *Lagenaria* was cultivated on one of the small plots at this site, in spite of the unfavourable climatic conditions? The organisation of the complex indicates an extremely rationalised use of the land for horticultural purposes. Features like the large number of wells, the parcelling of the terrain and the reclamation or irrigation system show to what extent man exploited the terrain for agricultural purposes. Perhaps we may consider

the cultivation of *Lagenaria* a phenomenon of this same organisation: we can imagine that much attention was paid to the cultivation of the gourd, that it was protected from the wind and the cold and was provided with abundant water.

##### 5. Résumé

Les fouilles qui ont été conduites sur le site gallo-romain du "Bois Harlé" à Longueil-Sainte-Marie (Oise) pendant 1988 et 1989 par l'équipe du Centre de Recherche Archéologique de la Vallée de l'Oise ont mis en évidence des phénomènes très intéressants. Dans le tiers méridional du site on a rencontré des fossés assez profonds dessinant un enclos trapézoïdal, qui est à son tour subdivisé par une série de fossés qui délimitent des parcelles. La vocation de cette partie du complexe est sans doute liée à des activités agricoles. Les fossés ont servi au drainage ou à la irrigation des parcelles, en tout cas au contrôle de l'eau.

15 prélèvements carpologiques pris dans les puits et les fossés ont été examinés par l'auteur à l'Institut de Préhistoire de Leiden. Des espèces intéressantes ont été trouvées, entre autres *Coriandrum sativum*, *Papaver somniferum*, *Cucumis sativus* et deux graines de *Lagenaria vulgaris* (Calebasse). On peut s'imaginer une soit-disant polyculture sur les différentes parcelles. La calebasse est une espèce d'origine tropicale, qui était, d'après entre autres Plinius, l'auteur romain classique, utilisée soit pour manger la pulpe, soit pour le stockage du vin etc. quand le pericarp était durcie. Le fait qu'on a trouvé les graines ici semble à y indiquer que le légume a été cultivé sur place.

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