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Autour du gobelet maritime : les vases à cordon, gobelets linéaires et productions épicampaniformes du nord-ouest de la France

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EDITOR'S NOTE

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Introduction

- 1 Our observations on Bell Beaker ceramics in north-western France show that a large number of vessels have not been studied as thoroughly as standard vessels, particularly maritime beakers. Although the formal analysis of standard ware is obviously crucial for understanding ceramic trends, we consider it essential to review the other main ceramic productions of the second half of the third millennium in north-western France. Hence, we chose three different themes to broaden the scope of the debate on the meaning of Bell Beaker pottery. The first concerns common ware, which accounts for most of the production in our study area. The second involves linear decorated beakers, assimilated to standard vessels and found all over Europe, since their origins

require further investigation. Thirdly, we return to the end of the phenomenon and the definition of the term *Épicampaniforme*.

I. Chronological and spatial scope of the Bell Beaker phenomenon in north-western France

- 2 Several cultural groups have been defined for the beginning of the late Neolithic in north-western France, just before the start of the Bell Beaker phenomenon. The Artenac is probably the best documented cultural group in western France during this period (Burnez & Fouéré 1999), but only extends into the southern part of the Pays de la Loire. The Gord occupies the Paris basin (Cottiaux 1995; Salanova 2011) including the Centre region, and is also present in Upper-Normandy and in the Sarthe department. The cultural definition of the area between these two cultures is still problematic. In the most recent studies, some authors place Conguel ceramics in this period (Giovannacci 2006), notably after the excavation of the site at Pléchâtel “La Hersonnais”, where dendrochronological dating was undertaken (Tinévez 2004). Others authors position these vessels between the middle Neolithic and the recent Neolithic (-3600 to -3300 BC, Blanchard 2012), with the consequence that there are no well-defined cultural groups in the first half of the third millennium in the Armorican massif.
- 3 Bell Beaker ceramic productions in north-western France develop from a cultural substratum that is difficult to characterize. However, they form a coherent group from a geographical point of view. They can be distinguished from other Bell Beaker areas in Europe by the absence of not only the vertical bands that occur along the Mediterranean, but also the complex decoration of the British beakers (Vander Linden 2004). Only two vessels have decoration motifs that are rather similar to the metopes on Central European beakers. The first comes from Guipavas “le Lavallot” in Finistère (Pailler 2015), and the second from Talmont-Saint-Hilaire “la République” in Vendée (Favrel, in process). Contrary to the situation in the Iberian Peninsula, there are so far no examples of figurative (Valera 2015) or naturalistic decoration (Garrido Pena & Muñoz López Astilleros 2000). Moreover, the number of undecorated beakers is relatively large. Unlike the area we discussed, we can consider that the Bell Beaker production of northwestern France stands out by the simplicity of its decoration structure, or its “monotony”, in the words of F. Treinen (Treinen 1989). Ceramic productions become more complex in several parts of Europe after the beginning of the phenomenon and its progressive merging with local culture, but the situation seems a little different in north-western France. We observe a large majority of Standard vessels (Salanova 2000), which are ceramics with only one decoration motif covering all the vase, such as the maritime beaker with the hatched band pattern, the linear beaker with covering horizontal line, or the linear beaker with reserved bands and groups of horizontal line. The dotted-geometrical style mixed style of the standard with geometrical theme such as chevrons, hatched triangles or cross-hatching, is the second most common style. Undecorated beakers form a third group. Others ceramics styles are much rarer, represented by very few vessels, as is the case with fingernail decorated beakers.
- 4 The last chronological model for the Bell Beaker phenomenon in northern France outlines three chronological stages for the funerary evidence (Salanova 2011). It is

possible to back up this hypothesis in north-western France by including data from development-led archaeology (Favrel 2015, Blanchet *et al.*, in process). Our chronological model identifies four successive stages:

- From -2550 to -2350, stage of appearance of the Bell Beaker phenomenon, presence of standard and dotted-geometrical styles;
 - From -2350 to -2150, intermediate stage, regionalization of the phenomenon;
 - From -2150 to -1950, last stage of the Bell Beaker phenomenon and first stage of the Armorican Barrow Culture, progressive disappearance of Bell Beakers;
 - From -1950 to -1750, Post-Bell Beaker stage and intermediate stage of the Armorican Barrow Culture, absence of Bell Beaker in the strict sense.
- 5 From a spatial point of view, we can subdivide the Bell Beaker phenomenon of north-western France into three groups, on the basis of differences in the relative proportion of decoration techniques and motifs (Favrel 2015):
- In Lower-Brittany shell-impressed decoration is by far the most frequent, while there is a similar proportion of different standard or dotted-geometrical patterns;
 - South of the Loire river the comb is the most widely used tool, whereas hatched bands dominate for the standard style and hatched triangles are the most common pattern for the dotted-geometrical style;
 - In north-eastern Brittany and Normandy, the comb is again the most widely used tool, but for the standard style the linear pattern is much more frequent than hatched bands; for the dotted-geometrical style, chevrons are more common than hatched bands.
- 6 Between these three areas, very few sites are known in the northern part of the Pays de la Loire, with exception of the north-west of the Mayenne, linked to the Normandy groups. No subgroups have been defined in the remaining area.

II. Vases à cordon

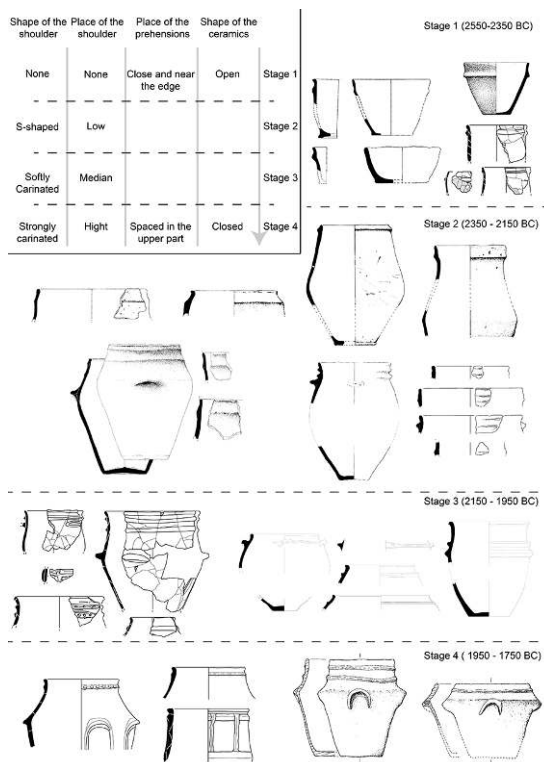
A. Definition of vases à cordon

- 7 The *vases à cordon* are oftentimes discovered on Bell Beaker sites, they are considered to belong to the Bell Beaker common ware (Besse 2003). They correspond to the types 4, 5, 6 and 8 of the typology settled by M. Besse (*ibid.*: 92). These flat-bottomed vases are generally coarse, with a limited variety of shapes and a common denominator: the presence of a smooth horizontal cordon usually under the rim, sometime just in the outside of the rim. The first discoveries (Joussaume 1981: 494, Joussaume 1986: 35) have since been complemented by numerous other examples, confirming the predominance of this type of container in the second half of the third millennium BC.
- 8 *Vases à cordon* evolved *in situ* during the second half of the third millennium after the typochronological model we realised for the ceramic productions of the second half of the third millennium BC (fig. 1; Favrel 2015). The geographical variability of shapes and decorations remains low in the actual state of knowledge. Shapes are generally simple and open in stage 1, such as vases with a tronconical or cylindrical profile. There are also some slightly closed shapes, such as barrel profiles. In the second stage, complex shapes, such as vases with low inflection and S-shaped-profiles are predominant, and slightly closed shapes, such as barrels, are very frequent. In the third stage, which marks the beginning of the Early Bronze Age, inflections tend to go up to the middle of the vessel, and sometimes form a sharp carene, the vessels are more closed, the

openings are tightened. Finally, after the Bell Beaker phenomenon, carinated vases are numerous, S-profiles rarer, and inflections are often located in the middle or upper third of the vase, and almost the entire ceramic repertoire consists of very closed forms such as biconical or bitronconical vases. The proportion of closed forms gradually increases over time, as does the degree of closure of vases.

- 9 In stages one and two, cordons are almost systematically smooth, and are located just under the rim. From stage three onwards, arciform and oval knob decorations appear, sometimes associated with cordons. Cordons are sometimes digitised, they can also be doubled or tripled and can be positioned anywhere on the neck. As a result, the smooth pre-oral cord is no longer as frequent in the ceramic assemblage of the Early Bronze Age, somehow losing its hegemonic position. Finally, in stage four, the proportion of pre-oral smoothed cordons further decreases, and the diversity of plastic decoration combinations increases, with vertical or orthogonal cordons applied to the neck, neck base or inflection point.

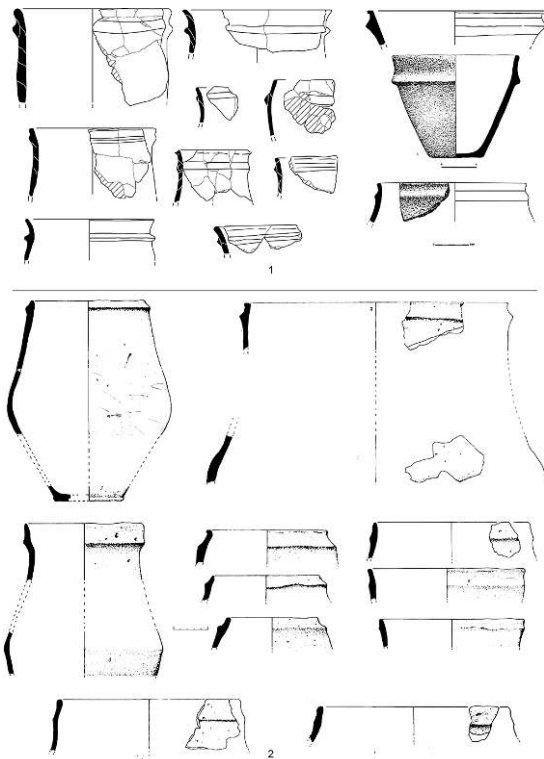
1. Chronological evolution of the vases à cordon in northwestern France, from predominantly simple and open form to complex and closed form



- 10 The drastic increase in discoveries on the Atlantic coast raises several questions. The first of these is of geographical nature, as it directly affects network six, identified by A. Gallay as the Rhone-Rhine network (Gallay 1986, Bailly & Besse 2004). In the central-eastern part of France and the western part of Switzerland, this type of vase is just as frequent as in our study region. In fact, both regions show very convincing parallels as regards domestic sites, despite their remoteness (fig. 2).
- 11 The most famous sites are those of Sur La Noue in Saint-Marcel (Saône-et-Loire; Salanova *et al.* 2005), the Republic in Talmont-Saint-Hilaire (Vendée; Gandois *et al.* 2015) and locus 6 of Le Vivier-Le Clos Saint-Quentin site in Poses (Eure), even though no

decorated sherds were identified at this locus (Billard *et al.* 1994). Finally, the Penancreac'h site in Quimper (Finistère) shows again some ceramics similar with those of Sur La Noue site in Saint-Marcel (Le Bihan 1992, Le Bihan 1993). For these reasons, M. Besse defined a southern complex of common Bell Beaker ceramics (Besse 2003). This includes cultural entities with a high proportion of cordon or cordon and perforation vases (types 4, 5, 6 and 8), along with other plastic decorations. We can add that vases à cordon now form the backbone of southern ceramics complex, as defined by M. Besse. They are a counterpart of the eastern group, corresponding to the *Begleikeramik* of Central Europe (Besse 2003: 165).

2. The vases à cordon discovered in northwestern France



1- La République, Talmont-Saint-Hilaire, Vendée (Favrel, in progress);

2- Le Vivier/Le Clos-Saint-Quentin, ensemble 6, Poses, Eure

(Billard *et al.* 1994)

- 12 A second question deals with the diversity of this ceramic assemblage. It appears to be ubiquitous because there is few shape and plastic decoration in use and they remain simple most of the time. This is problematic when trying to define a cultural tradition or a ceramic style, as we focus on the specificity, and it seems that vases à cordon don't have much. Would it be simplistic to define the pre-oral smooth cord vase, as a rather coarse vase, with a flat bottom? We do not think so. Simple typological characters have made it possible to define several ceramics styles in Northern France, such as the Quessoy (Giot *et al.* 1979, Cassen 1987), the Gord (Cottiaux 1995), the Deûle-Escout (Blanchet 1984, Piningre 1985), the Montet (Hamon 1997), the Horgen (Martineau 2000), the Clairvaux and the Chalain (Giligny *et al.* 1995), the Taizé (Ard 2014) or the Seuil du Poitou (Ard 2014). We simply note a cultural characteristic common to all these societies: a tendency towards low investment in ceramic decoration in Northern France. For now, we have to settle for that. The definition of a ceramic assemblage on

the basis of the pre-oral smooth cordon remains as convincing as that of the cultures mentioned above. Reliable contexts and radiocarbon dates now confirm the definition of this group.

- 13 The third question is raised by the spatial distribution of *vases à cordon*. They are found in many parts of Europe, but always in smaller proportions, or at a later stage than north and east of the Loire, or even in the South of France (Besse 2003). *Begleikeramik* elements, such as handles, polypod vases or tronconical cups, are known to have spread to Europe (Piguet & Besse 2009). Did *vases à cordons*, or the cordon feature alone, also spread in the same way?
- 14 This last question is functional, since this widespread plastic decoration may reflect the specific use of these containers, for fermentation, for example, rather than a homogeneous cultural group. Few chemical analyses are available for this period in France, and the profiles of these vases are rarely complete, which prevents us from substantiating this argument.

B. The spatial distribution of *vases à cordon*

- 15 *Vases à cordon* are the most important and homogeneous ceramic production of the second half of the third millennium in north-western France. It is thus legitimate to question where they came from. Do they correspond to an evolution *in situ* of ceramics produced during the late Neolithic period? Or local production influenced by other ceramic productions? Or, like Bell Beakers, production of allochthonous origin?
- 16 First of all, we can distinguish *vases à cordon* from the coarse ceramics of Artenac, a culture that was still established in mid-west France in the middle of the third millennium (Burnez & Fouéré 1999). Artenacian ceramic production includes vases with cordons, as do most of the cultures from the beginning of the late Neolithic on French territory, but they are rather digitized, and differ from Bell Beaker common ware:

« It is also important to underline that there is no perfect coincidence between the Campaniform sites and the Artenacian sites but the former are certainly more abundant than discoveries would lead us to believe (Bouchet & Burnez 1986). In addition, their very characterized common ware do not seem to have influenced the domestic ceramics from Artenac » (Burnez & Fouéré 1999: 262)
- 17 In the South of France, *vases à cordon* are abundant at some Bell Beaker sites, such as the Grotte Murée in Montpezat (Alpes-de-Haute-Provence; Courtin 1962). They are included in the southern complex, but are considered to appear after the initial development of the phenomenon, during the second stage of the Bell Beaker (Lemerrier & Furestier 2009). In the initial stage of the Bell Beaker, coarse productions are still related to local cultures: Fontbousse to the west of the Rhône, and Rhône-Ouvèze to the east (Lemerrier *et al.* 2014). The mechanism of emergence of the *vases à cordon* in the South of France still raises questions. Some elements, such as the *vases à cordon* with perforation of the Beaussement site at Chauzon (Ardèche), may possibly represent continuity between local ceramics of the late Neolithic and *vases à cordon* (Lemerrier 2002: 207), but this kind of example remain rare.
- 18 In Northern Italy, coarse ceramics contemporaneous with Bell Beakers sometimes include *vases à cordon*, amongst other plastic decoration. But the global influences on fine ceramics are shared between the Iberian Peninsula and Southeast France in stage

two of the Bell Beaker phenomenon, and Central Europe in stage three (Lemercier *et al.* 2007, Leonini & Sarti 2008).

- 19 In the Iberian Peninsula, there are few vases à cordon, and they are only known at several sites, in rather small proportions, such as Galicia (Prieto Martínez & Salanova 2009), or Catalonia (Martin Colliga 2001; fig. 4). A. Gallay already noted the existence of this type of vase in small proportions in the northern Iberian Peninsula (Gallay 1986). In Portugal, most of the undecorated shapes are cups or bowls, often with inset edges, and do not seem to be related to the vases à cordon (García Rivero *et al.* 2016).
- 20 In the Rhine Valley, and Benelux, coarse productions are often associated with *Riesensbescher* or *Potbecker* (Beckerman 2015). These vases were already observed before the Bell Beaker and bear a horizontal cordon often associated with nail decoration. These are probably the closest examples of the vases found in eastern and north-western France. During the Bell Beaker phenomenon, nail decorations on the belly and pre-oral cordons never appear on the same vases in our study area, whereas they are often associated in the Rhine Valley. This clearly differentiates them from the Rhine tradition. These sites are associated with the northern domain by M. Besse (Besse 2003: 167). In Germany, several sites have vases with pre-oral cordon, like Algaul in Brandenburg (Lehmphul 2018), and parallels with the southern domain are striking. But additional comparative elements (in the area between eastern France and north-eastern Germany) are still too rare to account for these similarities.
- 21 This rapid overview is rather brief and may appear simplistic, but it corresponds above all to problems of identification, definitions, and publications concerning coarse ceramics produced in the second half of the third millennium BC. The available data allow us to refine the spatial extension of the southern domain by withdrawing the Artenacian Centre-West, and by fully including Lower Brittany. Other regions have some horizontal cordons, such as Galicia, Catalonia and Northern Italy. Network six was originally defined by A. Gallay, identified on the Rhine and Rhône axes (Gallay 1986), and was refocused on the Rhône during a second phase (Bailly & Besse 2004). We propose extending it to the Loire to include the discoveries made in north-western France, and to underline the very high proportion of vases à cordon in the common ware of this area.

C. Hypothesis on the origin of the vases à cordon

- 22 According to current knowledge, the origin of vases à cordon in north-western France is probably to be found in the local substrate of the Late Neolithic period (fig. 3). Some earlier dates are known, such as the two vases à cordon discovered in the trench of the almond-shaped building of the Coin des Petits Clos in Trémuson in the Côtes-d'Armor (Toron *et al.* 2018, Roy 2016). Charcoals samples provided the following date: Beta-444995 3880±30 BP, or after calibration (IntCal 13) between -2570 and -2460 BC. Another datation gave an older result: UBA-37060, 4203±28 cal BP, i.e., 2895 et 2679 BC. These two vases à cordon are also associated with two vases with oval knobs and a decorated Bell Beaker neck with hatched and chevron bands impressed with a comb and an oval awl. The dating of the charcoal crust of a vase à cordon of La République provides a similar result: LTL15214A 3966±55 cal BP (IntCal 13), i.e., between 2580 and 2306 BC (Gandois *et al.* 2016). To reinforce this hypothesis, let us first note the very high proportion of vases à cordon among the coarse Bell Beaker ceramics in Northern

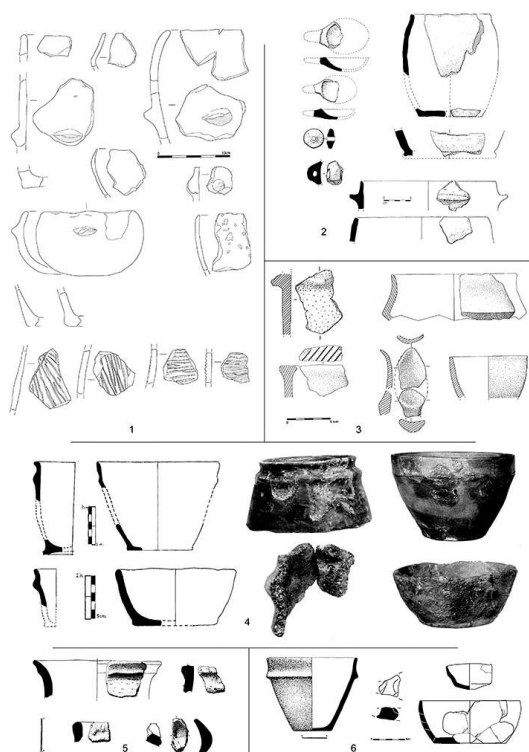
France. As far as we know, this type of vase does not seem to have been influenced by external stimuli, because these vases were not present in or around any regions near northern France before the development of the Campaniform. However, it should be noted that there are links with the Rhine Valley, where the Riesenbescher combines cord and nail decoration (Beckerman 2015). But these similarities seem to result from occasional contacts or areal effects between these two productions, and similarities in ceramic repertoires were observed before the development of the Bell Beaker phenomenon, at the end of the *Néolithique Récent* period between Kerugou and Vlaardigen (L'Helgouac'h 1967).

- 23 Although there are few reliable contexts for the middle of the third millennium, it should be noted that the late Neolithic coarse ceramics predating Bell Beakers display almost identical profiles to the first *vases à cordon*. Flat-bottomed tronconical or barrel-shaped vases are very common, as are hemispherical bowls, spoons and spindle whorls. The only difference is the plastic decorations; oval knobs are prevalent in the first half of the third millennium BC, while horizontal cordons under the rim largely dominate the second half of the third millennium BC. The reference sites on which these vases are found are La Hersonnais in Pléchéâtel (Ille-et-Vilaine; Tinévez 2004), La Barrais in Saint-Sauveur-des-Landes (Ille-et-Vilaine; Hinguant & Laporte 1997), Le Vivier/Le Clos Saint-Quentin locus 3 site in Poses (Eure; Billard *et al.* 1994), or the Plantis à Oisseaux (Mayenne; Letterlé 1984, Letterlé 1985).
- 24 These connections between the common ware of the late Neolithic and that of the beginning of the Bell Beaker are even more relevant if we consider other ceramic shapes. The site of La République in Talmont-Saint-Hilaire (Vendée) yielded a spoon, a round-bottomed bowl, a flat-bottomed bowl and a tronconical *vase à cordon* (Joussaume 1986). The site of La Sangle 2 on the commune of La Verrie in Vendée shows a structural association between a *vase à cordon* and a spoon (Marchand 2000). Bowls and spoons are characteristic elements of the late Neolithic, with flat-bottomed vases and oval knob decorations. Finally, there is a small group of four vases associated with a burial at the bottom of the *Allée couverte* of la Forêt du Mesnil, in Tressé, in Ille-et-Vilaine (Collum 1935). This set includes three *vases à cordon* and one flat-bottomed bowl.
- 25 We can summarize the situation by assuming that a gradual change occurred from flat-bottomed vases with oval knob decoration to flat-bottomed vases with cordon decoration around the middle of the third millennium BC. The only change concerns plastic decorations, with a replacement of the oval knob by a totally circular cord placed under the rim. This change is contemporaneous with the development of the Bell Beaker phenomenon, but does not seem to be linked to it for the moment.
- 26 Last but not least, we must now assess the relationship between Bell Beakers and *vases à cordon* (fig. 7). Majority of the Bell Beakers are local production (fig. 7, n°1), even if this tradition is non-native originally and come from the Iberian Peninsula, assuming a movement of some potters to Brittany (Salanova 2000). Most of the *vases à cordon* are coarse with flat bottom, the surface is just smoothed, they may come from a tradition of the Armorican late Neolithic (fig. 7, n°2). There also exists hybrid beakers like CZMB (Corded-Zoned-Maritime-Beaker), these are maritime beakers influenced by the Rhine decoration technique, horizontal lines are printed with small S-twisted cord (fig. 7, n°3). They show the exchange of influence between different European beaker networks. Thick Bell Beakers with flat bottom and brown or dark-brown colour are already drifting away from the maritime tradition by the craftsmanship of the paste

(fig. 7, n°4 et 5), point already noticed by P.-R. Giot, who considered that their paste was the same as Late Neolithic ceramics in the fifties (Giot *et al.* 1958). In fact, this type of paste refers broadly speaking to common ware, in this sense these ceramics could be imitations of Bell Beakers by local Late Neolithic potters. On the other hand, there is a case of a burnished Bell Beaker with fine orange paste reminiscent of the typical manufacture of maritime beakers featuring a horizontal cordon under the rim (Toron *et al.* 2018, fig. 7, n°6). This vase would thus be produced by a Bell Beaker potter influenced by the *vases à cordon*.

- 27 In short, these two ceramic traditions appeared at about the same time, coexisted over time, cover the same geographical area and were discovered at the same archaeological sites. But we can go further still, by emphasizing the fact that they were discovered in the same structures, which means that populations used them and threw them away indiscriminately. This confirms the petrographic observations highlighting borrowing preparation recipe of ceramics between potters, such as the use of chamotte (Convertini 1996, 2017). To conclude, we can add that reciprocal influences led to the adoption of S-shaped profiles of traditional maritime beakers on *vases à cordon*, and prompted maritime potters to apply horizontal cordons to certain beakers, like in Le Coin des Petits Clos, or even not to decorate them at all, which is a common feature in the final Neolithic period in Northern France.
- 28 More than temporary influences, we observe a *minima* that there is a partial mixture between these two ceramic traditions (fig. 7, n°7 and 8). Decorated beakers with horizontal cordons are known in two sites, Le Milin-Coz in Plestin-les-Grèves, Côtes-d'Armor (Salanova 2000: 268) and La Pierre-Levée in Nieul-sur-l'Autize, Vendée (Joussaume 1976: 413, fig. 4, n°15). This mixing is not total, since each tradition continues to produce its own range of specific containers until the beginning of the Early Bronze Age. Further research should make it possible to more accurately determine the relationship between these two groups of potters in the second half of the third millennium BC.

3. Solution of continuity between ceramic production of the Late Neolithic and the first vases à cordon associated to the Bell beakers



- 1- bâtiment C de La Hersonnais à Pléchâtel, Ille-et-Vilaine (Tinevez *et. al.* 2004);
 2- La Barrais, Saint-Sauveur-des-Landes, Ille-et-Vilaine (Hingant et Laporte 1997);
 3- Les Plantis, Oisseau, Mayenne (Letterlé 1984, 1985);
 4- La forêt du Mesnil à Tressé, Ille-et-Vilaine (Collum 1935);
 5- La Sangles 2 à La Verrie, Vendée (Marchand 2000);
 6- La République, Talmont-Saint-Hilaire, Vendée (Favrel, in progress).

III. What is the origin of the Linear Beaker?

A. A predominant decoration in northwest France

29 There are nearly 1000 decorated Bell Beakers in northwestern France, they are divided into different categories (tabl. 1):

- The decoration of the standard, with hatched stripes, horizontal lines or these two motifs at the same time, as well as the productions derived from the AOO and AOC vases of the Rhine valley composed of the same decorative motifs;
- The dotted-geometrical style;
- Fingernail or digitized covering decoration;
- Probably latter decorative techniques such as grooved or stamped decoration which appear at the end of the Bell Beaker phenomenon;
- Some marginal techniques like the incise-estampé (*stamped-incised*) or the poinçonné-pointillé (*dotted-stamped*);
- For some sherds the decoration technique is not known.

Tabl. 1. Absolute quantity and proportion of each decorative style in the second half of the third millennium BC

Type of decoration	Absolute quantity	Percentage
Standard or assimilated (Maritime, Linear, LRB, AOC, etc.)	469	50,11
Dotted-geometrical	205	21,90
Nail or finger decoration	88	9,40
Others (grooved, stamped, spatula)	58	6,20
Dotted-stamped ou incised-stamped	18	1,92
Indetermined	98	10,47
Total	936	100,00

- 30 Vases of the standard (Salanova 2000: 171) and productions of the Rhine valley (Lantig & Van der Waals 1976) account together for fifty percent of the decorated Bell Beaker ceramics. We can subdivide this category in seven different groups (tabl. 2). Maritime vases, with a decoration only made of hatched bands printed with a toothed tool, are the largest group (fig. 4, n°1). Linear vases, with a decoration only made with covering horizontal line with toothed tools are however almost as numerous (fig. 4, n°2), they are sometime called AOCComb in English. Linear beakers with reserved bands, with a decoration made of groups of horizontal line printed with toothed tools separated by reserved bands are relatively common (fig. 4, n°3), more than the derivation of AOC vases from the Rhine valley with a covering decoration made by printing horizontal line with a cord (fig. 4, n°4). The latter account for only 5 percent of the ceramic production with standard decoration.
- 31 The “variations of the standard” represent vases that alternate more or less evenly hatched bands and horizontal lines or groups of horizontal lines, thus mixing at least two of the three decorative themes of the standard vases that are printed with toothed tools. We find a majority of Maritime-linear vases, decorated only with toothed tool printing (fig. 4, n°5). The last group concern beaker mixing standard and Rhine tradition. The first subgroups mix the decoration motive of linear with reserved bands tradition with decoration technique from the Rhine valley tradition for the cord printing, we have called this category the CLRB (Corded-Linear-with-Reserved-Bands, fig. 4, n°6a). The last three subgroups mix pattern of hatched bands printed with shell or comb and horizontal line printed with cord. Two types of recipient are clearly defined in this subgroup. The CZMB (Corded-Zoned-Maritime-Beaker) are vases whose paste and shape, thin with orange or red color and intense burnishing, strongly remind the maritime beaker (fig. 4, n°6b). The only difference relies on the cord printing for the horizontal line framing the oblique hatching. Reserved bands remain between the hatched bands. The AOO vases or derivated from the AOO vases of the Rhine valley are also included (fig. 4, n°6d), they are high and thin ceramics with an alternating

decoration with toothed tools printed hatching and cord printed horizontal line, the decoration is totally covering, there is no reserved bands, decoration is sometimes inside the rim. Toothed tools used to print the hatching could witness an Iberian influence over typical Rhine production by form or paste (Guilaine *et al.* 2004). If AOO beakers are Rhine valley productions with influence from Iberian ceramics, it seems that CZMB are their exact opposites, they are vases of Iberian origin with influence from the Rhine valley. Between these two subgroups (with or without reserved bands, and with or without decoration inside the rim) there are intermediaries, with fine reserved bands (fig. 4, n°6c).

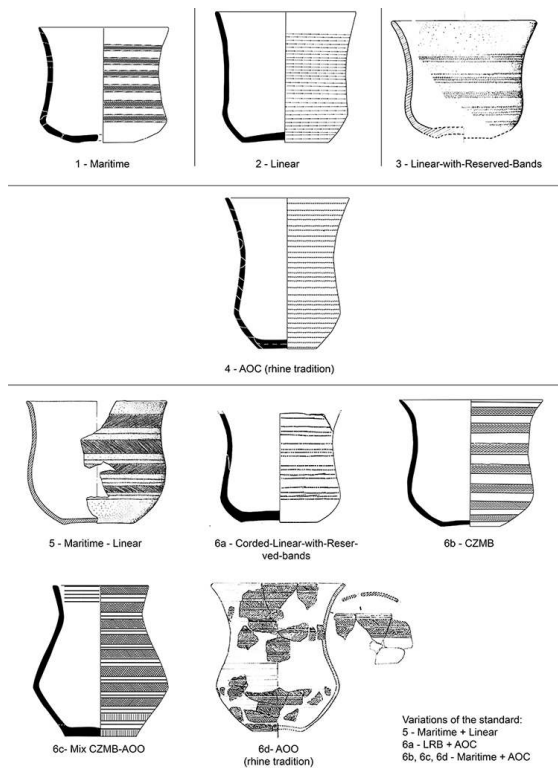
Tabl. 2. Absolute quantity and proportion of different types of beakers with horizontal line and/or hatched bands (standard, rhine tradition and hybrids)

Complete profile Monotonous decoration	Incomplete profile	Complete Profile	Incomplete Profile	Total	Percentage
1- Maritime	Hatched bands printed with toothed tools	20	132	152	32,41
2 - Linear	Horizontal line printed with toothed tools	16	108	124	26,44
3 - Linear with reserved bands	Bands of lines printed with toothed tools	12	47	59	12,58
4 - All-Over-Corded	Horizontal line printed with cords	6	17	23	4,90
Hybrids					
5 - Maritime-Linear	Hatched bands + Horizontal lines with toothed tools	4	69	73	15,57
6a - Corded-Linear-with-Reserved-Bands	Bands of lines printed with cords Reserved bands	2	7	9	1,92
6b - Corded-Zoned-Maritime-Beaker	Hatched bands printed with toothed tools Horizontal line printed with cords Reserved bands	3	12	15	3,20
6c - Between CZMB and AOO	Hatched bands printed with toothed tools Horizontal line printed with cords Half-reserved bands (thin reserved bands) Inner decoration sometimes	4	4	8	1,71

6d - All-Over-Ornamented	Hatched bands printed with toothed tools Horizontal line printed with cords No reserved bands Inner decoration sometimes	1	5	6	1,28
	Total	68	401	469	100,00

- 32 When we sort vases by category, we can see that there are almost as many linear beakers and linear beakers with reserved bands as maritime beakers (fig. 4). In spite of their quantitative importance, the origin of these two types of ceramics remain poorly investigated. In the past, these vases were considered to be hybrids, mixing Iberian and Rhine influences (L'Helgouac'h 1962, Salanova 1997: 262, 2000: 141). In north-western France, therefore, there would be a mixture of two non-native productions, which would eventually form two new kind of stylistic canon. The first problem with this hypothesis is that AOC beakers are much rarer than maritime beakers, so how can their influence be identical? Or should bias be considered in discovery contexts? The second, which follows on from this observation, is the invisibility of local cultures in the development of these ceramics, implying that everything develops exclusively within Iberian and Rhine valley Bell Beaker networks.
- 33 This ultimately raises the same long-neglected problem as for the common ware mentioned earlier, namely, the relationship between local cultures and non-local influences. The lack of data on local cultures leads to the creation of sometimes complex models, and completely circumvents the existence of indigenous populations. We think that it is necessary to return to the question of the genesis of beakers with linear and linear decorations with reserved bands (fig. 4).

4. Standard and variations of the standard



1 to 3 « standard » vases;

4- AOC vase;

5 to 6d- variations around the standard resulting from a combination of influence

B. Dating of linear beakers

- 34 Reliable radiocarbon dating is almost entirely lacking for linear beakers in north-western France. Since toothed tool printed decoration is extremely rare in stage three of the Bell Beaker (see Part III), it can be assumed that these vases appear during the second stage of the phenomenon, at the latest. Two dates were obtained for the pit burial of Les Hauts du Manoir in Cairon in the Manche (Giazzon 2011), containing a linear beaker with reserved bands, with a discontinuously applied decoration. The divergent results provided by radiocarbon dating place this container in the second or third stage of the Bell Beaker phenomenon. To our knowledge, this is the only dating that allows us to consider that printed decorations continue during the final stage of the Bell Beaker. However, the reliability of the samples can be questioned due to the disturbance of the grave or an old wood effect. Some radiocarbon dating obtained at the Alizay/Igoville site points to the existence of the horizontal line pattern in the second stage of the Bell Beaker, but the profiles of the vases are not complete (Aubry *et al.* 2015).
- 35 The only reliable dates come from other close regions, notably Portugal, Spain and the British Isles (tabl. 3). They confirm the existence of linear and linear beakers with reserved bands in stage two of the Bell Beaker, at the latest. The question of the appearance of these vases is uncertain, even though funerary contexts show interesting associations. Links between the burial of the Boscomb Bowmen in Wiltshire and Brittany have already been mentioned (Sheridan 2008, Pearson *et al.* 2007, Evans *et al.*

2006), and the ceramics do indeed present excellent points of comparison with northwest France, with linear beakers, *CZM-Beakers* and *AOC* beakers. However, this is a collective burial, so we must remain cautious about the contemporaneity of the containers. Radiocarbon dating places the phase of Bell Beaker burials between -2510 and -2300 BC (Barclay *et al.* 2011: 174). The typological study of ceramics from the graves of the Archer of Amesbury and the Boscomb Bowmens places linear and linear beakers with reserved strips no later than about 2350 BC in Great Britain (Fitzpatrick 2011: 50). The Bell Beaker occupation of the Sima barrow in Miño de Medinaceli, Spain, includes burials associated with a maritime beaker, a linear beaker and a linear beaker with reserved bands (ojo Guerra *et al.* 2006). It is dated on bones between -2460 and -2200 BC. In Leceia, in Portugal, a fragment of a possible linear beaker with reserved bands was discovered in the FM hut, which is mainly dated to the second quarter of the third millennium, between -2920 and -2500 BC, considering maximum deviations (Cardoso 2014: 66). This would make it one of the oldest known examples.

- 36 To sum up, the appearance of linear and linear beakers with reserved bands should be placed at the latest at the end of the initial stage of the Bell Beaker. It is possible that they may appear a little earlier, but no detailed chronology of the initial Bell Beaker stage could be carried out in our region. The chronological relationship between linear beakers and maritime or *AOC* beakers remains to be clarified.

Tabl. 3. List of radiocarbon dating on linear and linear with reserved bands beakers

Site	Laboratory	Non calibrated result	Calibrated result	Sample dated
Boscomb Down - Boscomb Bowmen	OxA-13542	3955±33 BP	2580-2340	Human femur
Boscomb Down - Boscomb Bowmen	OxA-13543	3822±33 BP	2470-2200	Human femur
Boscomb Down - Boscomb Bowmen	OxA-13681	3825±30 BP	2300-2140	Human femur
Boscomb Down - Boscomb Bowmen	OxA-13598	3889±32 BP	2470-2230	Human femur
Boscomb Down - Boscomb Bowmen	OxA-13624	3845±27 BP	2460-2200	Human femur
Cairon - Les Hauts du Manoir	Lyon-8258	3845±35 BP	2460-2200	Human bone
Cairon - Les Hauts du Manoir	Beta-302244	3700±30 BP	2190-2020	Human bone
la Sima - Miño de Medinaceli	KIA-17999	3860±30 BP	2460-2200	Human bone

la Sima – Miño de Medinaceli	KIA-18000	3862±28 BP	2460-2200	Human bone
Leceia – Hut FM	Sac-1317	4220 ± 50 BP	2920-2630	Mammal bone
Leceia – Hut FM	Beta-260297	4140 ± 40 BP	2880-2590	Humerus of <i>Sus</i> sp.
Leceia – Hut FM	Beta-260299	4100 ± 40 BP	2870-2500	Metacarp of <i>Bos taurus</i>
Leceia – Hut FM	Sac-1317	4220 ± 50 BP	2920-2630	Mammal bone
Leceia – Hut FM	Beta-260297	4140 ± 40 BP	2880-2590	Humerus of <i>Sus</i> sp.
Leceia – Hut FM	Beta-260299	4100 ± 40 BP	2870-2500	Metacarp of <i>Bos taurus</i>

C. Deconstructing the influences in the manufacture of linear beakers

C.1: Criteria to be considered

- 37 It seems appropriate to us to investigate more precisely which characters stem from an Iberian tradition, and which derive from a Rhine tradition in the crafting of linear and linear with reserved bands beakers. Several typological aspects of the beakers can be compared and four of them have been selected here. The profile of the vase is the first striking element and is one of the criteria for distinguishing between low and stocky maritime beakers and Rhine beakers, which are tall and slender. For the decorative technique the criteria concern the tool used to apply the decoration, for the Bell Beaker. This can be shells, combs, cords, or even awls. The third criteria relate to the decorative motif, it corresponds to the morphology and repetition of the smallest decorative unit to create a more or less complex symbol. This is mainly geometric motifs for the Bell Beaker: horizontal lines, hatched triangles or chevrons, for example. The fourth and last criterion concerns the structure of the decoration, which can be covering or not, organized in lines or panels, vertically or horizontally. Thus, the possibilities for a single decorative motif are almost infinite (Salanova 2000).

C.2: Profile comparison

- 38 Most linear and linear beakers with reserved bands are lower and wider than maritime beakers and L. Salanova used the term rectilinear to describe their profiles. They are therefore very different to the AOC beakers, which are the tallest and slimmest vases found in north-western France. If we consider the hypothesis that linear beakers are the result of a mixture of influences between Iberian and Rhine productions, we would expect the profiles of linear beakers to be somewhere between those of maritime vases and AOC vases, but this is not the case. The shape of linear beakers sometimes even tends towards a cylinder, with very low inflection, a slight neck, low height and a wide opening. Some AOC beakers have a well-marked inflection, almost a carene, and are taller. In fact, the idea of hybrid vases is not supported by the analysis of beaker

profiles. Linear and linear beakers with reserved bands are very similar to maritime beakers in this respect. Let us add that in the vast majority of cases they have an umbilicated bottom, such as maritime beakers, sometimes a raised bottom, and occasionally a flat bottom. While AOC beakers follow the opposite trend, they generally have a flat bottom, sometimes raised, but rarely umbilicated.

C.3: Decorative techniques

- 39 The decoration technique is another element of differentiation between linear and linear beakers with reserved bands on one hand, and AOC beakers on the other. The former are decorated with shell or comb printing, while the latter are decorated with cord printing. The use of the shell, then of the comb, is clearly related to a decorative technique typical of the Bell Beaker vases of the Iberian Peninsula. From this point of view, it seems that the decoration technique of linear beakers is a direct result of maritime production.

C.4: The decorative motif

- 40 The decorative motif of interest here is the horizontal line, but unlike the hatched band, it is not a really discriminating motif. This decoration can be found in all periods, and on many different forms, in the Neolithic as well as in the Bronze Age, and it would be too tedious to draw up an exhaustive list here. It therefore seems difficult, if not illusory, to determine the authorship of this decorative motif, especially since it was known before the appearance of the Bell Beaker phenomenon in the Netherlands, with the *PFB* (Lantig & Van der Waals 1976), but also in Brittany on Conguel vases (Tinévez 2004, Pollès 1986). Moreover, the production of hatched bands necessarily implies printing two horizontal lines. Let us add that this motif is also known in the Iberian Peninsula, even though it is less frequent there than in the northern half of France or Benelux. It therefore seems superfluous to us to define this feature as characteristic of Dutch beakers. The horizontal line pattern pre-dates the Bell Beaker in most of the Late Neolithic cultures of Northern France (Tinévez 2004) or the Rhine valley (Beckerman 2015), at least where the production of decorated fine ceramics is identified.

C.5: The structure of the decoration

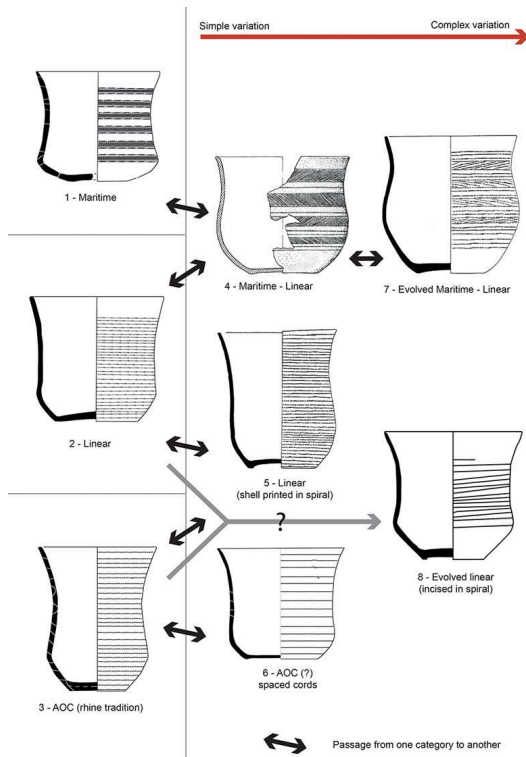
- 41 The decorative structure is almost identical for maritime beakers and AOC beakers, since it is a totally circular decoration, applied in horizontal lines or bands, and covers the entire exterior of the vase. This latter criterion led some authors to record the beginning of the Bell Beaker following the *PFB* in the Netherlands (Lantig & Van der Waals 1976). In the case of Rhine vases, the decoration sometimes even extends over the first few centimetres of the inner part of the rim. There are, however, some small differences between these two traditions: the AOC beakers from Brittany present a spiral printed decoration in some cases (Favrel, in process), so they are not strictly parallel horizontal lines as on linear or linear vases with reserved bands. On the other hand, there is a case of a beaker with an incised spiral decoration on the middle of the Er-Roh beaker at La Trinité-sur-Mer in Morbihan (fig. 5, n°8), and a spiral decoration printed with a shell on a slender beaker from Crugou at Plovan, Finistère (fig. 5, n°5). Finally, the decoration is generally close together with no blank space on linear vases, as on AOC beakers, whereas linear beakers with reserved bands and maritime beakers

bear alternating decorated and empty bands. Finally, the cords on some AOC beakers are sometimes very spaced out, as in Men-ar-Rompét in Kerbors (fig. 5, n°6; Giot *et al.* 1958), to the extent that the attribution to this type of vase raises questions.

- 42 It should be noted, however, that Bell Beakers are not the only ones to be taken into account in this analysis. Before the development of the phenomenon, no cases of linear decoration covering the entire vase were known in north-western Europe. On the other hand, there are several fine ceramic productions with linear decoration covering only the upper half of the container, as is the case with the Protruding Foot Beaker in the Netherlands, but also with Conguel vases in Brittany (L'Helgouac'h 1962, Pollès 1986). In the first case, the links with AOC beakers are clear, and have already been clarified in the past (Lantig & Van der Waals 1976, Vander Linden 2004). The chronological placement of Conguel bowl remains problematic for some authors (Blanchard 2012). We know today that these containers were produced in the first half of the third millennium, as on the site of La Hersonnais in Pléchâtel (Tinévez 2004), and are well dated to the twenty-seventh century by dendrochronological dating. Vases with linear pattern are dated only slightly earlier at the Groh-Collé site in Saint-Pierre-de-Quiberon (Blanchard & Guyodo 2015: 19). Thus, the idea of a linear decoration covering the upper half of the vase pre-existed the Bell Beaker phenomenon in the Netherlands, but also in north-western France, whatever the name given to the local culture of the late Neolithic on the Armorican massif.
- 43 The development of the structure of the decoration of linear beakers with reserved bands can be considered as being linked to maritime beakers. Only the filling of the bands changes, several horizontal lines in one case, oblique hatching in the other. But for linear beakers, the question is more complex. The obvious similarity between the structure of the decoration of linear beaker and AOC beakers argues in a sense for an AOC influence on the beakers of north-western France, which would adapt or imitate the horizontal line decoration using a comb or shell, a hypothesis already advanced by Portuguese authors (Hurtado Pérez & Amores Carredano 1982: 203). The linear beakers would thus be a local adaptation of the AOC beakers. It is also possible that linear and AOC beakers evolved alongside each other due to the fact that local ceramic traditions existed before the Beaker phenomenon in Brittany and the Netherlands. The parallel horizontal lines of the Conguel bowls are different to the spiral decoration observed on the AOC beakers. Let us add that the horizontal line pattern is largely predominant in the first half of the third millennium in Brittany, just before the appearance of the Bell Beaker phenomenon.
- 44 However, there is a third possibility, which does not comprise either Dutch or local influences in the development of a linear covering ensemble. This consists of a simplification in the process of decorating the maritime beaker. Horizontal lines are known to be systematically applied before hatching (Salanova 2000). Shortening the production line for maritime beakers, by passing over the hatching, actually leads to the creation of a linear beaker. In general, investment in the manufacture of linear beakers is less significant than for maritime beakers. Simplification can be observed at all stages of the *chaîne opératoire* since a simpler profile, a poorer quality paste for linear or linear beakers with reserved bands, with less intensive polishing, can be distinguished. The colour of the vase is less homogeneous, and is more often beige or yellow than brick-red or orange, whereas maritime beakers are only brick-red or orange. In our opinion, this hypothesis remains the simplest and most direct

explanation of the genesis of linear production, even though it is sometimes necessary to double the number of horizontal lines to produce a beaker with no blank space.

5. Some exemples of the variability inside the standard



n°1 to 6 hybrid vases,

n°7 to 12 vases of the standard, Rhenan or Rhenan influenced production

C. 6 The technology issue

- 45 Apart from S. Van des Leeuw's thesis (Van der Leeuw 1976), the Bell Beaker manufacturing technique is still an under-explored field of research. In his work, he assumes that Dutch beakers are mainly made by wrapping, whereby the cord played a role in maintaining the walls, in addition to the decorative technique. The hypothesis of wrap building could thus settle the debate on the authorship of linear beakers.
- 46 However, no evidence to this effect could be observed in north-western France, implying that linear and linear beakers with reserved bands are not made by wrapping in this part of Europe. The same is also true for the majority of the AOC beakers that we studied in our region, in keeping with previous observations (Salanova 2000). In most cases, the beakers are made with a small coil superimposed by discontinuous pressure, followed by polishing and then printing with cords. This criterion, which could have been decisive, cannot therefore be used to settle the question of the genesis of linear decorated productions. However, we must continue our technological studies on AOC beakers in order to determine whether there are any differences in the *chaîne opératoire* of these vases and the linear beaker.
- 47 If we pursue the idea of an influence of AOC beakers on the beakers of north-western France, we can detect three possible degrees of proximity. Very rare vases mounted with the Dutch wrapping technique, such as the one discovered in the Loire at Ancenis

in Loire-Atlantique (Salanova 2000: 251, PLC07), would be the closest shapes to the Rhine vases. Then, pseudo AOC vases mounted entirely in Breton-style coiling, and merely decorated with cord, are very good copies of the Dutch vases, although wrapping is absent. Finally, beakers printed with a shell or comb would be inspired by AOC vases, and locally reinterpreted. This model excludes the idea of a local influence in the genesis of the linear beaker. On the other hand, it assumes that a Bell Beaker base predated linear beakers, which were influenced in a second stage by AOC beakers. The shell printing technique, and the low and stocky profiles may only appear in Brittany in maritime beakers, and it is not an *ex nihilo* invention, nor an innovation originating in the Rhine Valley, which makes it necessary to assume a *Ruckstörm* (Sangmeister 1963), in one form or another (Laporte *et al.* 2008: 620). The existence of maritime beakers decorated with shells and including volcanic rocks in southern Finistère (Querré & Salanova 1995, Salanova *et al.* 2015) suggests that potters moved to Brittany.

D. The origin of linear and linear beakers with reserved bands

- 48 After studying the different characteristics of linear and linear beakers with reserved bands, then comparing them with maritime and AOC beakers, we can now return to our initial proposal. The idea of a hybridization between two productions from two different Bell Beaker networks does not seem to be the only valid hypothesis. Two other hypotheses can be mentioned. The very high frequency of the horizontal line pattern in the local final Neolithic period may have had an influence on Bell Beaker ceramic productions, even if this influence remains superficial, in every sense of the word, since it only concerns the decoration of the horizontal line. Moreover, this pattern remains rare in the Iberian Peninsula. The second hypothesis is even simpler, it assumes an autonomous evolution of maritime beakers, or some maritime beakers, through a process of simplification. A secondary external contribution, from Brittany or the Rhine, is still possible.
- 49 In both cases, the influence of the Rhine Valley is not compulsory to make these hypotheses work, even if it is highly possible. The Crugou beaker in Plovan, Finistère, is a good example (fig. 5, n°5). The very slender profile and the decoration of horizontal spiral lines clearly evoke Rhine influences. We can consider that these hypotheses are not mutually exclusive, but let us add that it is not possible to manufacture linear and linear beakers with reserved bands without Iberian influences, in terms of the profiles of the vases and the decoration techniques. The decorative motif criterion is not decisive. The structure of the decoration does not provide falsifiable arguments, in the Popperian sense of the word. In our opinion, the ceramic traditions of Northern France and Benelux, which were relatively close before the development of the Bell Beaker, responded in a similar way to the latter phenomenon. They may also even have influenced each other during a later period (fig. 4, n°2, 3, 4 et 6a for example)
- 50 The lack of radiocarbon dating is a clear limitation to our interpretations, as the date of appearance of the linear beaker is still not known. After having estimated the weight of maritime and Rhine influences, it seems that there are two possible time series models to explain the development of linear and linear beakers with reserved bands.
- 51 In the first case, linear beakers develop rapidly following the emergence of the maritime tradition in north-western France, either by simplification or through local

influence. In parallel, the rapid extension of the maritime network to the Rhine valley brings the Ruckstörn, which in turn leads to the appearance of AOC, AOO and CZMB beakers on the Atlantic coast. This model assumes a Rhine influence through a Ruckstörn of small amplitude.

- 52 In the second case, maritime beakers do not give rise to any derivatives until they reach the Rhine Valley, where the response of local cultures in the Rhine Valley leads to a high amplitude Ruckstörn, since in addition to explaining the appearance of AOC, AOO and CZMB beakers on the Atlantic coast, linear and linear beakers with reserved bands also appear at the same time.
- 53 Ultimately, the choice of one or the other of these hypotheses completely changes the weight of influences attributed to the Iberian Peninsula and the mouth of the Rhine in the development of the Campaniform of Northern France, since it makes it possible to determine the filiation of the beakers with linear and linear decoration with reserved bands. In the first case, these ceramic productions are local, Rhine influences remain very limited since AOC and CZMB beakers are rare whereas those from the Iberian Peninsula are largely predominant. In the second case, the role of Rhine influences is almost equivalent to that of the Iberian Peninsula. It is impossible for us to definitively choose between these two models, but we can still ask many questions.
- 54 The role of local cultures in France has yet to be clarified. Is it certain that only the corded sphere, more particularly the PFBs, responded clearly to the maritime network by creating new type of beakers? Simple technical transfers are observed between Bell Beaker and local cultures, particularly for Fontbouïsse and Artenac, but there may also be more complex cases such as copies or hybrids made by cultures much less resistant to Bell Beakers in its initial stage? Ignoring the Armorican Late Neolithic in northwestern France, from the Rhône-Ouvèze, to the Chalain in southeast France would demonstrate a form of passivity of these cultures towards the Bell Beaker. On the other hand, it is nevertheless unlikely that they all responded in an identical manner each time, by manufacturing the same linear beakers. Is there an area of origin for linear and linear vases with reserved bands?
- 55 How can the same Rhine influence lead to the formation of AOC, AOO, CZMB, Linear and linear beakers with reserved bands, which are nevertheless different? Should we consider it as an arrhythmic phenomenon in time and space, assuming that linear beakers are an answer to AOC beakers, a replica of Ruckstörn in short?
- 56 If the idea that linear beakers appear in response to the Rückstörn is not surprising, we might also postulate that it may be the response of local cultures in France to the maritime network before or during the Ruckstörn, rather than after? The logic behind the appearance of the linear beaker is not very different from that of the AOC beakers.
- 57 Let us conclude by raising one last point, of a more general nature. The northwest and southeast of France are the two regions with the highest concentration of Bell Beaker sites in the country. They show a very similar development of the phenomenon in its initial stage. Yet there is little evidence of contact between these two regions. Rather, they appear to react in a similar way to the maritime and Rhine networks that develop over just a few generations (Salanova 2003). As these networks follow different routes, respectively the Loire and Rhône valleys, divergences could have appeared along the way. However, this does not seem to be the case. What are the chances then that vases à cordon and nail decorated vases from the southern domain as well as linear and linear beakers with reserved bands develop almost identically, synchronously and

independently everywhere? Except for late productions such as the Rhone-Provençal style, and epicampaniform vases, the parallels are striking and should be explored further.

IV. Late developments of the Bell Beaker

A. The definition of the Epicampaniform

58 The absence of an incised-stamped style in the stage 2, or a barbed wire style in the stage 3 of the Bell Beaker caused problems in the northwest of France. No new decorative tradition emerged after the appearance of the phenomenon, the technique of comb or shell printing dominates most of the chronological sequence, incision is also present, but remains rare, and many vases are not decorated. In this context, how could the stages of the Beaker phenomenon be subdivided without using the *vases à cordon*?

59 Using decorative motifs of Bell Beaker might be a solution, but differences in decoration do not only depend of chronology. Spatial, statutory or functional reasons can also be advanced to explain the variability of the known decorations (Salanova 2000). Only large-scale statistical processing and reliable and dated context associated with fine decorated ceramics could allow a head start on these questions, in order to follow the frequency of each motif across space and time. How to define the Epicampaniform in northern France and differentiate it from previous stage? The issue of the Epicampaniform in northern France was already raised a few years ago:

« Dans les régions méditerranéennes qui ont connu un fort développement du Campaniforme, les ensembles céramiques de transition restent donc imprégnés de ce courant, justifiant le terme d'Épicampaniforme pour les derniers siècles du III^e millénaire. Cependant, la notion d'Épicampaniforme devrait être manipulée de manière restrictive, réservée à la situation méridionale. Sinon, comment qualifier, par exemple, ce qui succède au Campaniforme – synchronique de l'Épicampaniforme du Midi – dans la moitié nord de la France sans amener une confusion supplémentaire ? Épicordé ? Cordé tardif ? » (Laporte *et al.* 2008: 620)

“In Mediterranean regions with a marked development of the Campaniform, transitional ceramic ware was impregnated by this trend, thereby justifying the term Epicampaniform for the last centuries of the third millennium. However, the notion of Epicampaniform should be used with restrictions and reserved for the southern situation. Otherwise, how would we describe what follows on from the Campaniform – synchronous with the Epicampaniform in the South of France – in the northern half of France without adding additional confusion? Epicordé? Late Corded ware?” (Laporte *et al.* 2008: 620)

60 Our typo-chronology strengthened these doubts (Favrel 2015). First, most of the beakers for a long time illustrated as typical of the terminal stage of the Bell Beaker phenomenon are undated, and rarely from reliable contexts. Secondly, the discoveries made in recent years at several sites have brought to light new ceramic productions, they are radiocarbon dated to the junction between the third and second millennia. How old then are the “old” epicampaniform vases? Are they only contemporary with recent discoveries?

61 These discoveries, mainly made in development-led archaeology, offer a new perspective on the material culture of the stage 3 of the Bell Beaker phenomenon.

Decorated ware is identified by thin S-shaped beakers, but they differ from 1 and 2 stage beakers in a number of ways:

- Inflexion point is higher, sometime in the middle of the vase;
 - Diameter of the bottom is smaller;
 - Diameter of the neck is smaller;
 - Presence of red slip is very common;
 - Some of these vases have a handle;
 - Decoration is rare, incision is the only one recorded for sure.
- 62 The vases historically associated with the Epicampaniform in north-western France are different from recent discoveries have different features:
- They have a printed decoration, but less neatly decorated than the standard beaker;
 - They are thicker than the average beaker;
 - The surface is bumpy;
 - The profile is less symmetrical;
 - The burnishing is less invested, rock temper cut through the surface;
 - Color is not homogenous, the firing process seems less well controlled.
- 63 The best example is vase n°1 from the Men-ar-Rompel site in Kerbors, Côtes d'Armor (Giot *et al.* 1958, fig. 9). The observation is as follows: most of the vases considered as Epicampaniform in north-western France are mainly beakers of the dotted-geometric style with little technical investment. As stage 3 of the Bell Beaker was poorly defined until very recently, these few beakers were considered as a possible junction point between the standard beakers of the early Bell Beaker and the handle vases of the ancient Bronze Age, associated with the Armorican Barrow Culture (Giot *et al.* 1979, Stevenin 2000).

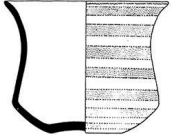

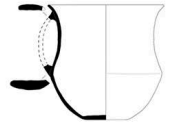

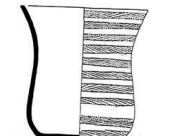
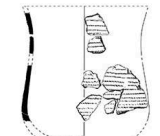
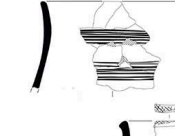
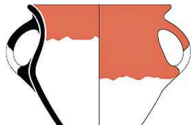
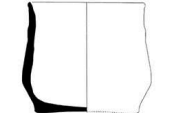

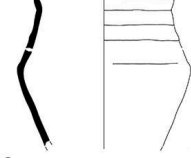

B. Criticisms of the epicampaniform model from north-western France

- 64 The previous model implicitly assumes a gradual evolution (Briard 1984: 116), which makes it possible to observe a decrease in potters' investment in ceramic production at each stage. This is observed in firing, the choice of temper, surface topography, surface treatments, the application of decorations and the general symmetry of shapes. During the first stage, maritime beakers are the most accomplished pieces. Some containers, such as Early Bronze Age handled vases of the Armorican Barrow Culture, equivalent of the Early Bronze Age 2, and stage 4 of or typo-chronology, are sometimes coarse and asymmetrical. It was therefore tempting to place the least invested Bell Beakers in a late stage of the Beaker phenomenon to fill a chronological gap, and allow for the possibility of evolution of the Bell Beaker towards the handled vase.
- 65 This assumption is no longer viable. There is no gradual decline in potters' investment in their ceramics. Recent discoveries show that there are very good quality containers during the last stage of the Bell Beaker like Beg-ar-Loued in Molène (Finistère; Paillet & Nicolas 2018) but that discovery contexts differ. From a technical point of view, they can even be compared to the standard beakers. The absence of a covering decoration could possibly be interpreted as a simplification of decorative techniques, but other parameters must be taken into account in addition to the presence of decoration. Beakers from the 3 stage are at least as thin as the beakers from stages 1 and 2, but the shape is different. The base of the beakers is much tighter, as is the neck, so we

gradually move away from the almost cylindrical profiles of Breton beakers towards rather biconical vases (Favrel, in process). This shows a certain technical skill, and a greater complexity in the building of ceramics. These examples clearly show that fine ceramic productions are present at each stage, affirming the real know-how of potters. The idea of a gradual decline or disinvestment after the appearance of the Bell Beaker is therefore no longer tenable, at least as a global chronological phenomenon.

- 66 This fact can be explained by the many unknowns that limited our interpretation until a few years ago. The first of these unknowns concerns the estimation of the variability of ceramic production at each Bell Beaker stage. The chronological argument was used to explain the differences between the vases (Treinen 1989). As more data became available, and the corpuses became more extensive, the idea that dotted-geometric style vases could be practically contemporaneous with maritime beakers was gradually accepted in southeast France (Lemerrier 2004, 2012, 2018, Lemerrier *et al.* 2014). It was possible to go a little further in the northwest of France, since common ware productions, such as *vases à cordon*, are attested at each stage of Beaker development (Favrel 2015). It seems that one or more styles of decorated fine ceramics and common ware production are associated with each stage of Bell Beaker development.
- 67 The increase in knowledge tends to blur the supposed stylistic differences between the different Bell Beaker stages. This is probably due to ceramic deposition practices, which change over time and confuse the issue. For decades, most of the vases associated with Bell Beaker were beakers found in megalithic monuments. Those of the Early Bronze Age were vases with handles discovered in barrows. But the excavation of dwelling sites has changed the situation and some forms now appear to be much more ubiquitous than in the past. We notice, for example, that there is beakers with handles but they are almost lacking in megalithic monuments. *Vases à cordon* are very rare in megalithic monuments, and almost non-existent in Armorican barrow deposits. All these vases are on the other hand frequent in dwellings, even though they are contemporaneous with these funerary monuments, or even in the earth of the barrow.
- 68 The best way to summarize this situation is to create a grid representing the different types of ceramics identified for each Bell Beaker stage and the beginning of the Early Bronze Age (fig. 6). While there are still some empty cells in this diagram, but they are now few in number, and have tended to decrease in recent years. Deposition practices, mainly at funeral sites, show a drastic selection inside the ceramic production, dwelling discoveries eventually allowed to rebalance the data.

6. Investment in the production of fine ceramics, mainly Beakers and handle vases, at each stage of the Campaniforme

	First stage -2550 to -2350 B.C.	Second stage -2350 to -2150 B.C.	Third stage -2150 to -1950 B.C.	Fourth stage -1950 to -1750 B.C.
	Late Neolithic culture / Beginning of the Bell Beaker phenomenon	Regional culture of the Beaker phenomenon	Late beaker phase / Beginning of the Armorican barrow culture	Armorican barrow culture
Strong invest- ment	 ?	 14C	 14C	 14C
Average investment	 ?	 14C	 14C	 14C
Low invest- ment	 ?	 14C	 14C	 14C
	Radiocarbon dating: 14C	Hypothetical position (no radiocarbon dating) : ?		

The panorama is almost complete. However, the radiocarbon dates of the initial stage are still missing, but it is likely that the maritime beakers can be placed there. The existence of vases that were not very invested in the initial stage is still hypothetical.

C. The old and the new Epicampaniform

- 69 It is now fitting to recall the results of the excavations carried out at the Leceia site in Portugal (Cardoso 2014). The two dry stone buildings outside the enclosure are associated with the Bell Beaker. They each combine different ceramic styles, the first contains standard and Palmela style vases, while the second comprises Palmela and incised style vases. These styles are largely contemporaneous with each other. These results overturn the idea of a strict succession between maritime beakers, Palmela style and incised style. Once considered typical of the Early Bronze Age, and later of the Bell Beaker cycle, Palmela style appeared before 2200 BC. It therefore seems that the difference is not spatial or chronological but rather statutory or functional, which is consistent with our observation concerning filling practices.
- 70 The degree of investment in ceramic production cannot be a relevant chronological marker in Brittany. Bell Beaker shards with a carelessly printed decoration exist at several stage 3 sites, but when we look more closely at the discovery contexts, we notice that they very rarely allow for strict associations. The case of Bell Beaker shards in the earth of Early Bronze Age barrows has long been known (Briard 1976, Briard *et al.* 1977). They are discovered out of context, as in Roc'h Croum in Santec, in Finistère (Lecerf 1981). In most cases, these shards are very fragmented and small in size. It is thus generally accepted that they are in a secondary position in most funerary sites, and therefore they cannot be associated with stage 3 of the Bell Beaker.

- 71 For dwellings, the situation is no more satisfactory. At Beg-ar-Loued, in Molène in Finistère, the rare beaker shards decorated with impressions are anterior to the building, which is well dated to the third stage of the Bell Beaker (Pailler & Nicolas 2018). The beakers contemporaneous with the building are undecorated, and sometime bear handles. On the Kerisac site, at Plouisy in the Côtes-d'Armor, the few decorated shards have no discovery context and they do not come from the pits dated to the third stage of the Bell Beaker (Mentele 2013). Finally, in Penancreac'h in Quimper, Finistère, only one pit yielded shards decorated by printing (Le Bihan 1993). However, it is at some distance from the main concentration of structures in the centre of the site, and has not been dated. In addition, the site seems to have been occupied for a certain period of time due to the density of structures, and could extend over several distinct stages of the Beaker phenomenon.
- 72 In sum, no definite evidence of hollow decoration printed with a shell or comb is known in Brittany, Pays de la Loire or Normandy in stage 3. On the other hand, carelessly printed decorations are known in the second stage of the Bell Beaker, such as at the Crec'h-Choupot site in Trédarzec (Côtes-d'Armor; Nicolas 2014), where they are dated between 2350 and 2150 BC, or on the Alizay/Igoville site (Eure; Aubry *et al.* 2015), where the printed shards are dated before 2150 BC. Let us also mention the goblet of Rhineland influence at the site of La Folie, at Poitiers (Tchérémissinoff *et al.* 2011). Again, for this vessel, the application of decoration, but also the general workmanship leave something to be desired, and it is dated between 2350 and 2150 BC.
- 73 The few decorated vases dated from the third stage of the Bell Beaker are in fact incised, like the container discovered in a windfall at Lenn-Sec'h in Caudan in Morbihan (Levan 2016). Some sites could have acted as a junction between stages 2 and 3, including the incised and red slipped beakers of the ZAC de Lavallot in Guipavas in Finistère (Pailler 2015) and the dwelling of Zone D des Florentins in Val-de-Reuil (Eure; Billard 1991).
- 74 We can consider that decoration by printing disappears or has completely disappeared during the third stage of the Bell Beaker. During this period, beakers are undecorated, often with red slip, sometimes with a handle. We observe several incised decorations. This seems consistent with data observed in other regions, such as in Southern Germany (Heyd 2000, Heyd 2007), and Alsace (Salanova 2000). In the southeast of France, barbed wire sets took over from dotted-geometric sets at the same time. In fact, many of the vases long considered to be Epicampaniform or Epimaritime in north-western France should probably be placed in the second stage of the Bell Beaker since they are decorated by printing. There are reasons to believe that some vases are a little later, but the available data do not confirm this hypothesis for now.
- 75 Eventually, stage 3 of the Bell Beaker is also completely contemporaneous with the first stage of the Armorican Barrow Culture, which is itself currently being redefined (tabl. 4). The term Epicampaniform acts as a duplicate, unless it simply refers to a portion of the fine ceramic production. The problem is that this ceramic in Northwestern France is different of the Epicampaniform of the southeast, whom the Barbelé style is the most reknown feature. Several Epicampaniform should be defined then. It seems unnecessary, at least in Britany, so why name these cultures by giving precedence to a past tradition (the beaker), instead of emphasizing the emergence of the barrow phenomenon? In this regard, the term Epicampaniform is almost pejorative: rather than clearly naming these Early Bronze Age cultures, they are only

referred to as the heirs of the Bell Beaker. The use of this term in northwestern France is in fact due to the lack of information that long characterized the very beginning of the Early Bronze Age, and to the practicality of a term that refers to the end of the phenomenon. Another conflict arises if we choose to define vases from the end of the stage 2 as Epicampaniform, since they are then older than those of south-eastern France. Eventually some beakers are still produced in stage 3 of our typochronology, they would be then latter than the Epicampaniform!

76 In our opinion, it is the emergence of a new character that must predominate in naming a sequence: the beaker fulfilled this function for the middle of the third millennium, while pre-existing traditions still persisted. It seems logical to do the same for the emergence of the barrow phenomenon which coincides with the last stage of the Bell Beaker. It remains to be seen whether denomination of the Armorican Barrow Culture, which has been questioned since the discovery of barrow in the plain of Caen, outside the Armorican massif, will be retained (Blanchet *et al.*, in process). The question is rather how to name it.

Tabl. 4. Main ceramic style for each chronological stages

Stage 4: 1950 to 1750 BC	Early Bronze Age 2 (post-Bell Beaker)	Armorican Barrow Culture 2	- Beakers and biconical vases with rep slip (sometime two handle) - Vases à cordon evolved: (arciformes, languettes, cordons lisses ou digités souvent associés entre eux à divers degrés, profils carénés, bords rentrants)
Stage 3: 2150 to 1950 BC	Early Bronze Age 1 / Bell Beaker 3 (disappearance of the Bell Beaker)	Armorican Barrow Culture 1	- Beakers with rep slip (sometime with handle) - tronconical cups - lids - rare polypods - Vases à cordon evolved: (arciformes, languettes, cordons lisses ou digités souvent associés entre eux à divers degrés, profils en S, parfois carénés)
Stage 2: 2350 to 2150 BC	Late neolithic 3 / Bell Beaker 2 (Regionalisation of the Bell Beakers)	New cultural groups to define	- Standard, variations of the standard, other standardized productions (same but good and average craftsmanship) - Dotted-Geometrical (same but good and average craftsmanship) - Vases à cordon (S-shaped, in barrel)

<p>Stage 1: 2550 à 2350 BC</p>	<p>Late neolithic 2/ Bell Beaker 1</p>	<p>Conguel (?), Gord, Artenac And Bell Beaker phenomenon</p>	<ul style="list-style-type: none"> - Standard, variations of the standard, other standardized productions: (maritime, linear, LRB, AOC, AOO, maritime-linear, CZMB, CLRB...) - Dotted-Geometrical (good craftsmanship) - Vases à cordon (tronconicals, in barrels, in cylinder) - Vases with knobs (tronconicals, in barrels, in cylinders) - few spoon and spindle whorls
<p>Absolute chronology</p>	<p>Period</p>	<p>Archaeological culture</p>	<p>Main ceramic styles</p>

D. Research ideas on low-investment beakers

- 77 However, the results presented here should not be limited to the final stage of the Bell Beaker. They already have direct impact aftermath on the second stage of the phenomenon. They could also have indirect impact on the initial stage of the Bell Beaker, and make us rethink the chronology of the phenomenon in Northern France. Indeed, we do not know when beakers with poorly invested decoration appear. If we exclude the idea of a gradual decline in ceramic production, how can we explain the genesis of these vases? Do they only appear during the second stage of the Bell Beaker?
- 78 There are many reasons to explain the production of poorly invested vases, in addition to the idea of a decline. The first idea that comes to mind assumes that this is the work of apprentices, but the quantity of vessels involved, and their significant proportion in the production of decorated fine ceramics, raises questions. Another hypothesis is that these vases are copies of the well-made beakers, in which case these poorly invested containers would be produced by local potters trying to imitate the vases of Bell Beaker potters. In several places where Late Neolithic culture remains dynamic after the beginning of the Bell Beaker, such as the Centre-West, where Artenac is well established, or even in Languedoc with the Fontbouïsse culture, there are nevertheless very clear stylistic and technical transfers between the Bell Beaker and local cultures (Cormenier 2009, Convertini 1996, 2017). What should we imagine then in Brittany, where the situation is almost totally opposed to what is known in these two regions? The absence of copies or imitations, whether from local potters to Bell Beaker, or vice versa, would in fact evoke a compartmentalized development of ceramic traditions, or their replacement. This idea is however contradicted by discoveries on dwellings where local productions and Bell Beakers are associated in structures, which means that those two different traditions are used by the same peoples. It is theoretically possible to imagine two groups of contemporaneous potters who do not or almost do not exchange despite a very long period of cohabitation, as E. Gandon observed in India between the Hindu potters of the Pradjapati caste and the Muslim potters of the Multani Khumar caste (Gandon 2011: 244). But the fact that there are Bell Beakers with horizontal cordon or vases à cordon with S-shaped profiles, which do not exist before the beginning of the phenomenon, leads us to believe that technical transfers and reciprocal

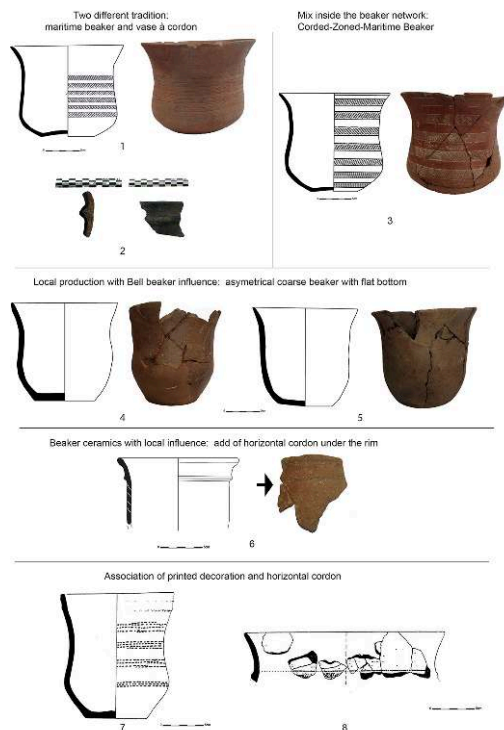
influences did indeed take place. Finally, the Milin-Coz vase in Plestin-les-Grèves, Côtes-d'Armor, combines two cordon and a linear decoration with reserved bands (fig. 7, n°10), representing more than transfers, and at least a partial fusion of ceramic assemblages over time, in keeping with the idea of a fusion horizon (Needham 2005). We may hypothesise a sort of popularization of Bell Beaker ceramics, which would be formed at a time when local and non-local traditions were becoming increasingly difficult to distinguish from each other due to the continuity of local relationships over time, alongside reciprocal influences and technical transfers between groups of potters.

79 This criterion could also serve as a definition for the second stage of development of the Bell Beaker, thus demonstrating the emergence of new cultural complexes in north-western France and the impossibility of distinguishing between the Bell Beaker influenced by local traditions and local sites with a share of Bell Beaker ceramics. It is also necessary to define new cultural groups derived from a mixture of Bell Beaker and local cultures during stage 2 of the phenomenon. Naming these cultural entities will also make it possible to name those that derive more or less directly from them during the third stage of the Bell Beaker. In this regard, we reiterate the comment made by R. Furestier:

“the temptation to provoke would tend to state that the Bell Beaker no longer exists after stage 2” (Furestier 2004: 96)

80 We can consider that the Epicampaniform is in a way a term in waiting intended to compensate the lack of data on the end of the Beaker culture, coupled with a guarantee of not mixing the beginning of the Early Bronze Age and the end of the Bell Beaker with a period when the relationship between these entities was not clear. Most of these issues have been resolved today. Stages 1 and 2 correspond to the Bell Beaker, stage 3 to the Early Bronze Age 1 and stage 4 to the Early Bronze Age 2. It is not needed to use the term Epicampaniform to characterize cultural entities of northwestern France, furthermore the Armorican Barrow Culture already fulfil this function, at least on a part of our study arena. The next step in our research should allow us to go further and define and name the cultural groups in the 2 stage of the Bell Beaker. It will be also necessary to clarify the definition of the Armorican Barrow Culture in the stages 1 and 2 of the Early Bronze Age. At the same time, it will be necessary to deepen the definition of the different ceramic styles within each of these cultures.

7. Some evidence of technological transfers, borrowings or copies inside the Bell Beakers networks or between the vases à cordon and Bell Beakers



Conclusion

- 81 Our objective was to demonstrate the important research potential of ceramic materials, in addition to the maritime and AOC beaker. It must be acknowledged that the place of common ware, linear beakers and the late Beaker phase are of crucial importance in understanding the integration and subsequent median and terminal development of the Bell Beaker phenomenon in north-western France. Initially, this was intended to provide a better understanding of the chronology of the phenomenon, through the addition of new radiocarbon dates and the increasingly dense information related to the development of development-led archaeology. Our initial intention was to make up for a certain delay in research compared to other regions of Europe. It quickly became clear that this also made it possible to propose new explanations for the local integration of the Bell Beaker, by going back to the initial stage of the phenomenon and presenting new arguments. The contribution of technological studies has proved decisive in this debate, since this approach makes it possible to question the weight of the various Beaker networks in north-western France. This method allowed us to recognize and locate in the *chaîne opératoire* an influence, a technical transfer or a copy of an allochthonous character. The continuation of our work should make it possible to complete our observations, in order to definitively solve certain issues, while defining new cultural groups in north-western France.

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ABSTRACTS

The definition of a ceramic production is a major challenge in archaeology, it must regularly be interrogated and updated. The case of the Bell Beaker phenomenon in Northwestern France give an obvious example: if observations focus on a typological study according to a bibliographical approach then the proposed classification show a relative monotony of the decorations on ceramic productions. A technological approach allows to go deeper into the question and go beyond this limit by bringing new elements to the debate: decoration techniques, firing process or building techniques to name only the most important criteria. Technological approach enriches the debate, allowing to decompose the different stream of influence that may have been observed on a vase or a ceramic tradition. It thus offers a study protocol capable of identifying more clearly the technical transfers, influences, copies and borrowings that punctuate the evolution of ceramic styles. We propose to combine typological, technological analysis and context review to formalize or redefine certain ceramic productions of northwestern France with diffuse boundaries dated to the second half of the third millennium. We will focus in particular on three types of vases: the vases à cordon, linear and linear beaker with groups of line and finally "épicampaniforme" vases. Questioning these productions makes it possible to weigh the various underlying social and economic implications of these productions, to compare them with others well-identified productions such as maritime beakers or vases belonging to the dotted-geometric style. This will ultimately allow us to discuss the relationships between productions, and the validity of certain key concepts of Campaniforme.

La définition d'une production céramique est un enjeu majeur en archéologie, elle doit régulièrement être interrogée et actualisée. Le cas du phénomène campaniforme dans le nord-ouest de la France en fournit un exemple flagrant : si les observations se bornent à une étude typologique d'après une approche bibliographique alors les classements proposés montrent une relative monotonie des décors sur les productions céramiques. Une approche technologique permet d'approfondir la question et de dépasser cette limite en apportant de nouveaux éléments de réflexion : techniques de décorations, de cuisson ou de montage des vases pour ne citer que les critères les plus importants. L'approche technologique enrichit la discussion, elle permet de décomposer les différents courants d'influence ayant pu être observés sur un vase ou une

tradition céramique. Elle offre ainsi un protocole d'étude à même d'identifier plus clairement les transferts techniques, les influences, copies et emprunts qui rythment l'évolution des styles céramiques. Nous nous proposons de coupler analyse typologique, technologique et relecture de contextes pour formaliser ou redéfinir certaines productions céramiques du nord-ouest de la France aux contours diffus datés de la seconde moitié du troisième millénaire. Nous nous concentrerons particulièrement sur trois types de vases : les vases à cordon, les gobelets à décor linéaires et linéaires à bandes réservées et enfin les vases épicanpaniformes. Interroger ces productions permet de mesurer les diverses implications sociales et économiques sous-jacentes à ces productions, de les comparer aux autres productions bien identifiées comme les gobelets maritime ou les vases du style du pointillé-géométrique. Ce qui permettra au final de discuter des rapports entre productions, et de la validité de certains concepts clefs du Campaniforme.

INDEX

Mots-clés: Campaniforme, céramique commune, gobelet linéaire, gobelet linéaire à bandes réservées, Épicanpaniforme, vases à cordon, nord-ouest de la France

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