

Continuity or rupture?

Investigating domestic structures during the Final Neolithic and the Bell Beaker culture in central-eastern France and western Switzerland

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The region comprising central-eastern France and western Switzerland is particularly interesting when considering the transition between the final Neolithic and Bell Beaker periods, around 2500 BC. Indeed, the modalities of this transition are diverse, and depend on whether one observes domestic or funerary structures, technical expertise, economic networks, ideologies, or population movements. These are the many nuances that one must take into account when adopting a holistic approach to Neolithic societies. In this research, the authors identified over a hundred Bell Beaker sites, from tenuous traces to domestic architecture, from isolated objects to funeral complexes. Only sites with domestic structures definitely attributed to the Bell Beaker culture are considered here. We will attempt to understand the modalities of the final Neolithic to Bell Beaker transition through the perspective of domestic structures and their function and roles within the landscape. First, domestic structures belonging to the final

Neolithic are presented, followed by those associated with Bell Beakers, and concluding with a synthesis of the observations made on the importance of the Neolithic substrate in the establishment of the Bell Beaker culture.

Before the Bell Beaker culture: central-eastern France and western Switzerland

In central-eastern France and western Switzerland the final Neolithic phase, preceding the Bell Beaker culture, was characterised by six cultural groups (Fig. 8.1), ‘Chassey niveau 5’, Saône Group, Chalain Group, Auvernier-Cordé, ‘Néolithique final valaisan’ and Lüscherz. They are presented here, following their geographical location from west to east.

The ‘Chassey niveau 5’ Final Neolithic

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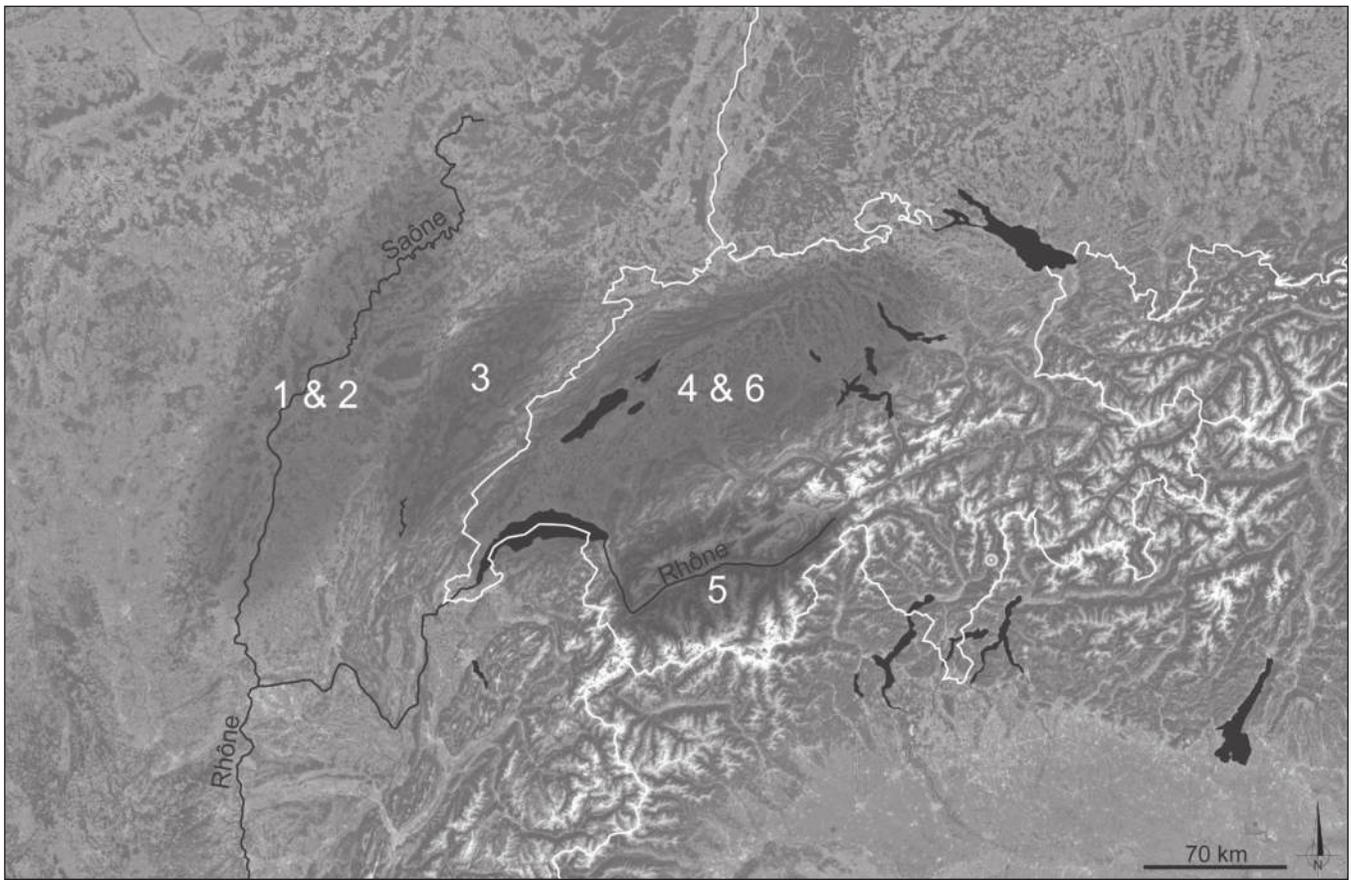


Figure 8.1: Location map of the pre-Bell Beaker cultures of central-eastern France and western Switzerland. 1 – ‘Chassey niveau 5’ Final Neolithic; 2 – Saône group; 3 – Chalain group; 4 – Auvernier-Cordé; 5 – Néolithique final valaisan; 6 – Lüscherz

(Fig. 8.1,1) lasted between *c.* 3000–2400 cal BC (Thevenot *et al.* 2015), although some researchers narrow its time span to 2800–2350 cal BC (Lemerrier *et al.* 2015). Most of the sites linked to this culture are found on the limestone hills located alongside the Saône valley, between the Dijon and Mâcon regions (Thevenot *et al.* 2015).

To this day, very little is known about the architecture and organisation of ‘Chassey niveau 5’ settlements. Even the eponymous fifth level of Chassey-le-Camp ‘La Redoute’ site only revealed scarce traces of structures. These included two post-holes and fragments of burnt daub with wattle impressions but no structure plan could be reconstructed (Thevenot 2005). The lithic assemblages linked to this group revealed contacts with northern and central France, as some raw materials have been proven to have come from the Grand-Pressigny, Berry, Oise valley and Sens regions (Thevenot *et al.* 2015). The majority of the pottery has rounded rims and open forms including hemispherical vases (some with a carination) and more cylindrical forms with

a flattened base. Oval-shaped lugs were quite common (Thevenot 2005).

Saône Group – Saône drainage basin (F)

The Saône group (Fig. 8.1,2) appeared around 2900–2800 BC and lasted until 2400–2300 BC (Thevenot *et al.* 2015). The settlement sites attributed to this group were mostly located on river banks, close to fords, tributaries or small islands, but it appears that they were not pile dwellings (Jeunesse *et al.* 1998; Thevenot *et al.* 2015). As with ‘Chassey niveau 5’ their architecture is almost unknown (Lemerrier *et al.* 2015) although a few rectangular structures have been identified at Ouroux-sur-Saône ‘Le Grand Bois’/‘Le Taillis’, the main archaeological site for this group (Thevenot *et al.* 2015).

Southern influences can be observed in the lithic assemblages, in the form of diamond-shaped arrowheads with lateral indentations. Other lithic types such as barbed and tanged arrowheads and Grand-Pressigny daggers, have been found in Saône group sites and indicate contacts with Bell Beaker groups

(Jeunesse *et al.* 1998). In terms of pottery, the assemblages mostly have cylindrical shapes with open mouths, rounded bases, and horizontal lugs (Jeunesse *et al.* 1998; Thevenot *et al.* 2015).

Chalain Group – western Jura plateaux (F)

Sites from the Chalain group (Fig. 8.1,3) date from 2700–2650 BC to around 2400 BC (Giligny *et al.* 1995). These pile dwellings were situated on the shores of Lakes Chalain and Clairvaux in the Jura (Pétrequin 1998). The three typical sites for this group are Clairvaux III, La Motte-aux-Magnins (Clairvaux-les-Lacs), and Chalain 2 Fontenu (Jeunesse *et al.* 1998). The material culture from these sites revealed a cultural background rooted in the preceding Clairvaux group, as well as influences from the Auvernier-Cordé group (see below) (Giligny *et al.* 1995; Pétrequin 1998).

The architecture of Chalain settlement structures is well-preserved thanks to their location in wetland areas. The rectangular houses, of around 8 × 4 m, were built on three rows of piles and had raised floors (Jeunesse *et al.* 1998). The associated lithic assemblages are diverse, with 14 types of arrowheads, the two most frequent being diamond-shaped with an elongated tang, and the second a larger arrowhead with short barbs, both of which are linked to the preceding Clairvaux group. Auvernier-Cordé influences are most clear in the pottery assemblages, with rounded- or flat-based jars with horizontal lugs decorated with a smooth or impressed cordon (Giligny *et al.* 1995; Jeunesse *et al.* 1998).

Auvernier-Cordé – western Swiss plateau (CH)

The Auvernier-Cordé culture (Fig. 8.1,4) appeared around 2700 BC in the Trois-Lacs region, in the western part of the Swiss Plateau (Pétrequin 1998). The pile dwellings that make up the majority of sites concentrated on lake shores and some bays appeared to have been occupied by several villages at the same time (Arnold 2012). Like the Chalain settlements on the western side of the Jura mountains, Auvernier-Cordé villages are particularly well preserved and the house plans and architecture are almost identical to the Chalain group with the rectangular structures supported by three rows of piles and with raised floors (Winiger 2008; Arnold 2012). The houses were built

on both sides of a central wooden walkway with several perpendicular rows running off. The villages themselves, located in floodplains, were often enclosed by fences (Winiger 2008) and the most iconic settlement was discovered in Concise ‘Sous-Colachoz’ (Vaud) (Winiger 2008).

Auvernier-Cordé pottery is characterised by Lüscherz roots (see below) and influences from the Corded Ware Culture (Pétrequin 1998) and comprises in particular hemispherical vases (Giligny *et al.* 1995).

‘Néolithique final valaisan’ – Upper Rhône Valley (CH)

The fifth cultural group in our research area, the ‘Néolithique final valaisan’ (Fig. 8.1,5), existed from *c.* 3300–2500 cal BC (Besse 2012) and was present in the Upper Rhône Valley (Valais and Vaud, CH). Settlements were established below 1000 m on small hills alongside the Rhône, or on alluvial fans as at Collombey-Muraz ‘Barmaz I’, Savièse ‘Château de la Soie’, Sion ‘La Gilière’ and ‘Sous-le-Scex’, Saint-Léonard ‘Les Champlans’, and Bramois ‘immeuble Pranoé D’ (Mottet *et al.* 2011).

Few of these sites have produced structural remains, the exception being Bramois ‘Immeuble Pranoé D’, where sub-rectangular, partly subterranean houses were discovered. Lithic assemblages mostly comprise imported flint and the most frequent pottery type is a cylindrical or slightly barrel-shaped vase with horizontal lugs and a smooth cordon (Mottet *et al.* 2011).

Lüscherz – western Switzerland

The final group was the Lüscherz (Fig. 8.1,6), which spanned the period 2900–2700 BC (Stöckli 1995). Settlements from this group were located in Western Switzerland and were mainly pile dwellings. The main sites are at Auvernier (‘Port’, ‘Tenevières’, ‘Ruz Chatru’, ‘Brise-Lames’, ‘La Saunerie’), Concise ‘Sous-Colachoz’, Delley ‘Portalban II’, Genève ‘Parc la Grange’, Saint-Blaise ‘Bain-des-Dames’, Thielle-Wavre ‘Pont-de-Thielle’, Vinelz ‘Strandboden’ and Yverdon ‘Avenue des Sports’ (Pugin & Corboud 2006).

The architecture is characterised by rectangular houses built on three rows of piles, their longest side parallel to the lakeshore. The known examples from Delley ‘Portalban II’ had a standard width of 4 m, while their

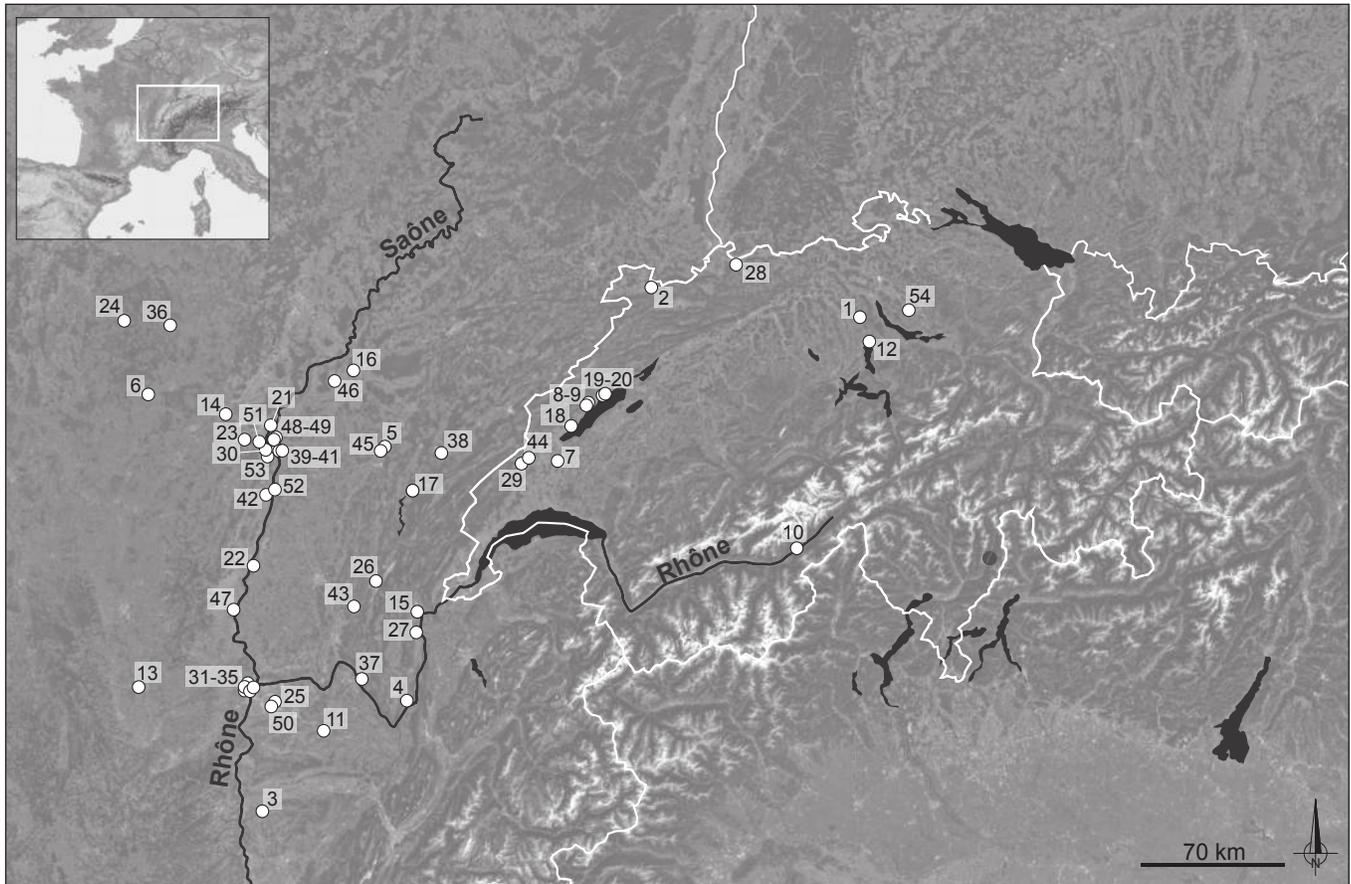


Figure 8.2: Location map of the Bell Beaker settlements of central-eastern France and western Switzerland. The numbers refer to Table 8.1

length could vary between 10–20 m (Danérol *et al.* 1991). The later Chalain and Auvernier-Cordé groups used similar building techniques.

Lüscherz lithic assemblages were the first in Switzerland in which Grand-Pressigny flint was found showing clear links with central France (Stöckli 1995). Most of the arrowheads are diamond-shaped (Pugin & Corboud 2006) whilst most of the pottery consists of cylindrical-shaped vessels with a round or slightly flattened base. Decoration includes small buttons and lugs, sometimes accompanied by smooth cordons (Giligny & Michel 1995).

The Bell Beaker culture in central-eastern France and western Switzerland

Within this study area, the Bell Beaker culture seems to appear with a slight chronological lapse depending on the region concerned. For the Saône valley, radiocarbon dates indicate an appearance *c.* 2600 cal BC (Lemerrier *et al.* 2015) whilst in Switzerland researchers argue

for an appearance nearer *c.* 2500 cal BC (Besse 2012). The end date of this phenomenon, on the other hand, is agreed at around 2200 cal BC (Besse 2012; Lemerrier *et al.* 2015). Some 54 settlement sites with domestic structures belonging to the Bell Beaker culture have been identified (Fig. 8.2). Of these, 24 are located in the Saône valley or slightly more to the east, 15 are in the High Rhône valley, downriver from Lake Geneva, one is in the same valley but high in the Alpine massif, two are on the western Jura plateau, and 12 are on the Swiss plateau.

The sites concentrate in three zones. The first, and most densely occupied, is situated in the Saône valley around Chalon-sur-Saône, and includes the sites of Marnay, Ouroux-sur-Saône, Lux, Saint-Rémy, Saint-Marcel, Dracy-le-Fort, and Crissey. The second follows the Rhône River with the sites of Injoux/Génissiat, Châtillon-en-Michaille, Arbignieu, Montagnieu, as well as the five sites situated within the city of Lyon. The third concentration is localised on the northern shore of Lake Neuchâtel, on the western Swiss Plateau, and includes the sites of

Table 8.1: *The Bell Beaker settlements of central-eastern France and western Switzerland*

No.	Name of site	Département/Canton	Country
1	Affoltern 'Zwillikon-Weid'	Zurich (ZH)	Switzerland
2	Alle 'Noir-Bois'	Jura (JU)	Switzerland
3	Anneyron	Drôme	France
4	Arbignieu 'Site de plein air'	Ain	France
5	Arlay 'Champ-Joly'	Jura	France
6	Autun 'Les Grands Champs'	Saône-et-Loire	France
7	Bavois-en-Raillon	Vaud (VD)	Switzerland
8	Bevaix 'Le Bataillard'	Neuchâtel (NE)	Switzerland
9	Bevaix 'Treytel-A Sugiez'	Neuchâtel (NE)	Switzerland
10	Bitsch 'Massaboden'	Valais/Wallis (VS)	Switzerland
11	Bourgoin-Jallieu	Isère	France
12	Cham 'Oberwil-Hof'	Zoug/Zug (ZG)	Switzerland
13	Chambéon	Loire	France
14	Chassey-le-Camp 'le Camp de Chassey'	Saône-et-Loire	France
15	Châtillon-en-Michaille 'En Chatanay'	Ain	France
16	Choisey/Damparis 'Les Champins'	Jura	France
17	Clairvaux-les-Lacs 'La Motte aux Magnins'	Jura	France
18	Concise 'Courbes-Pièces'	Vaud (VD)	Switzerland
19	Cortailod 'Sur les Rochettes-Est'	Neuchâtel (NE)	Switzerland
20	Cortailod 'Petit Ruz'	Neuchâtel (NE)	Switzerland
21	Crissey 'Le Mont'	Saône-et-Loire	France
22	Crottet, Grièges, Replonges & Saint-André-de-Bâgé	Ain	France
23	Dracy-le-Fort 'Les Varennes'	Saône-et-Loire	France
24	Dun-les-Places 'Le Vieux Dun/Champs de la Barre'	Nièvre	France
25	Genas 'Sous Genas'	Rhône	France
26	Géovreissiat/Montréal-la-Cluse 'Derrière-le-Château'	Ain	France
27	Injoux-Génissiat 'La Bressane'	Ain	France
28	Kaiseraugst AG	Argovie/Aargau (AG)	Switzerland
29	Les Clées 'Sur les Crêts'	Vaud (VD)	Switzerland
30	Lux 'La Perrouze'	Saône-et-Loire	France
31	Lyon 'Boulevard périphérique Nord'	Rhône	France
32	Lyon '35 Rue Auguste-Isaac'	Rhône	France
33	Lyon-Vaise 'Gorge de Loup'	Rhône	France
34	Lyon 'Rue Elie Rochette/Rue du Père Chevrier'	Rhône	France
35	Lyon 'ZAC des Blanchisseries'	Rhône	France
36	Marilly-Ogny 'Le Champ du Saule/ Les Champs d'Aniers'	Côte-d'Or	France
37	Montagnieu 'Roche Noire'	Isère	France
38	Montrond 'Grotte de la Margot'	Jura	France
39	Ouroux-sur-Saône 'Carrière des Boulets'	Saône-et-Loire	France
40	Ouroux-sur-Saône 'Le Grand Bois' & 'Le Taillis'	Saône-et-Loire	France
41	Ouroux-sur-Saône 'Le Petit Bois'	Saône-et-Loire	France
42	Plottes 'Beauvois'	Saône-et-Loire	France
43	Poncin 'Abri Gay'	Ain	France
44	Rances 'Champ-Vully'	Vaud (VD)	Switzerland
45	Ruffey-sur-Seille 'À Daupharde'	Jura	France
46	Saint-Aubin 'Les Prés-Allenot'	Jura	France
47	Saint-Georges-de-Reneins 'Boitrait'	Rhône	France
48	Saint-Marcel 'La Noue'	Saône-et-Loire	France
49	Saint-Marcel 'le Breuil'	Saône-et-Loire	France
50	Saint-Priest 'ZAC des Feuilly'	Rhône	France
51	Saint-Rémy 'Moulin-de-Droux'	Saône-et-Loire	France
52	Tournus 'La Croix Léonard'	Saône-et-Loire	France
53	Varennes-le-Grand 'La Maison Blanche'	Saône-et-Loire	France
54	Wetzikon 'Kempton, Tösstalstrasse 32–36'	Zurich (ZH)	Switzerland

Bevaix 'Treytel-A-Sugiez', 'Le Bataillard' and Concise 'Courbes-Pièces'.

Bell Beaker settlements

A thorough literature review demonstrates that the majority of sites have not provided sufficient data to allow for a full reconstruction of the habitat (Thevenot *et al.* 2015). This may be due to the state of preservation which was quite poor in most cases, or to the flimsiness of the structures themselves which is not conducive to their preservation in any conditions. It is therefore difficult to recognise any changes in the model of the Bell Beaker culture compared to that of the preceding cultural groups. Archaeological knowledge of Bell Beaker settlements in this region therefore remains partial so this study will only present the clearest examples of Bell Beaker architecture, and attempt to deduce general trends from the available data. In the following description, the site numbers refer to those used in Figure 8.2 and Table 8.1.

The site at Lux 'La Perrouze' (no. 30) is a dryland site located in the Saône valley. Structural remains include four cylindrical flat-based pits, a lenticular pit, and one post-hole (Fig. 8.3, ST 4). The first four pits can be interpreted as silos or stores, before being used for waste disposal (Ducreux 2013).

The site of Bevaix 'Le Bataillard' (no.8) is situated on the northern shore of Lake Neuchâtel but is a terrestrial site. The discovery of eight post-holes allowed the reconstruction of a rectangular structure (Fig. 8.4), measuring 3.7 m by *c.* 13 m (von Burg 2002; Leduq *et al.* 2008). The discoveries from Cortaillod 'Sur les Rochettes-Est' (no.19) (Fig. 8.5) permitted a more extensive reconstruction, from both an architectural and organisational point of view. This site is situated on a calcareous hill to the north of Lake Neuchâtel. The post-holes excavated represented the remains of seven structures, oriented NW–SE, and about 12–14 m apart. Erosion seems to have destroyed what would have been the centre of this settlement, which would have extended farther to the south-east. Five of the structures probably belong to the first phase of construction, with the last two, which overlapped the earlier structures, representing a later phase. These rectangular buildings consist of three rows of post-holes and vary between 3.8–4.6 m wide, and between 13.4–17 m long (von Burg 2002).

Sieving the contents of the post-holes allowed for the identification of 70 taxa, in the form of seeds, fruits, and carbonised plant fragments, and over 4000 macroremains revealed an economy based on agriculture, especially the cultivation of spelt, and the gathering of wild food sources (von Burg 2002).

Despite being in the flood plain of the Saône River the site of Saint-Marcel 'La Noue' (no. 48) (Fig. 8.6) is a dryland site (Salanova *et al.* 2005). Hardly any post-holes have been found but the negative structures are well preserved and the hypothesis that the lack of post-holes is due to erosion must be dismissed. A four-post structure has been found and identified as a storage structure or linked to diverse activities such as flint knapping. The house structures are identifiable as floor areas with traces of walls measuring about 7 × 10 m. These wall traces form three parallel rows, oriented N–S. Two hypotheses have been proposed regarding the reconstruction of the building architecture. The first, that they are the remains of a temporary campsite, must be rejected due to the large number of archaeological artefacts found during the excavations, including over 370 pots. The second hypothesis is more acceptable, suggesting that they were constructed on sill-beams with mortises cut to hold the uprights and that they had a raised floor. This model, with some variation, has been proposed for the lacustrine Bronze Age site of Zurich 'Mozartstrasse' and of Rances 'Champ-Vully'.

The terrestrial site of Géovreissiat/Montréal-la-Cluse 'Derrière-le-Château' (no. 26) (Fig. 8.7) is situated in a steep valley between the Ain and the Rhône (Bailly *et al.*, 1998; Hénon et Vérot-Bourrély 1999; Besse 2003a). The large quantity of architectural remains seems to indicate a long-term occupation and a dozen buildings have been identified. These were built on three rows of post-holes, and often oriented E–W, perpendicular to the mountainside. The smallest structures measured 2 m² and were identified as grain stores, whilst a circular structure was interpreted as a possible enclosure (Fig. 8.7,2). The longest buildings measured 8 m and 14 m respectively, the larger having apsidal ends (Fig. 8.7,1) (Hénon & Vérot-Bourrély 1999). The other structures vary between 3.5–4.5 m × 6–11 m long however, the majority are between 6–8 m (Bailly *et al.* 1998).

The settlement of Lyon 'Boulevard péri-

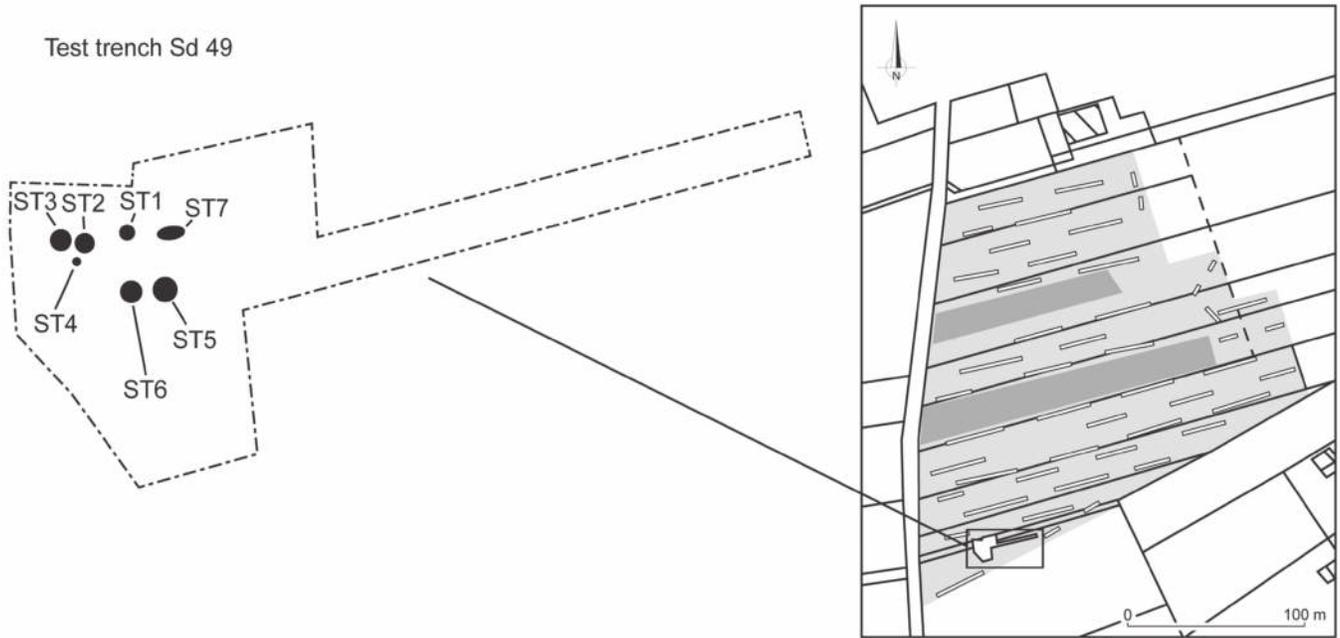


Figure 8.3: Plan of the Bell Beaker settlement at Lux 'La Perrouze' (Saône-et-Loire, F) (after Ducreux 2013, 398)

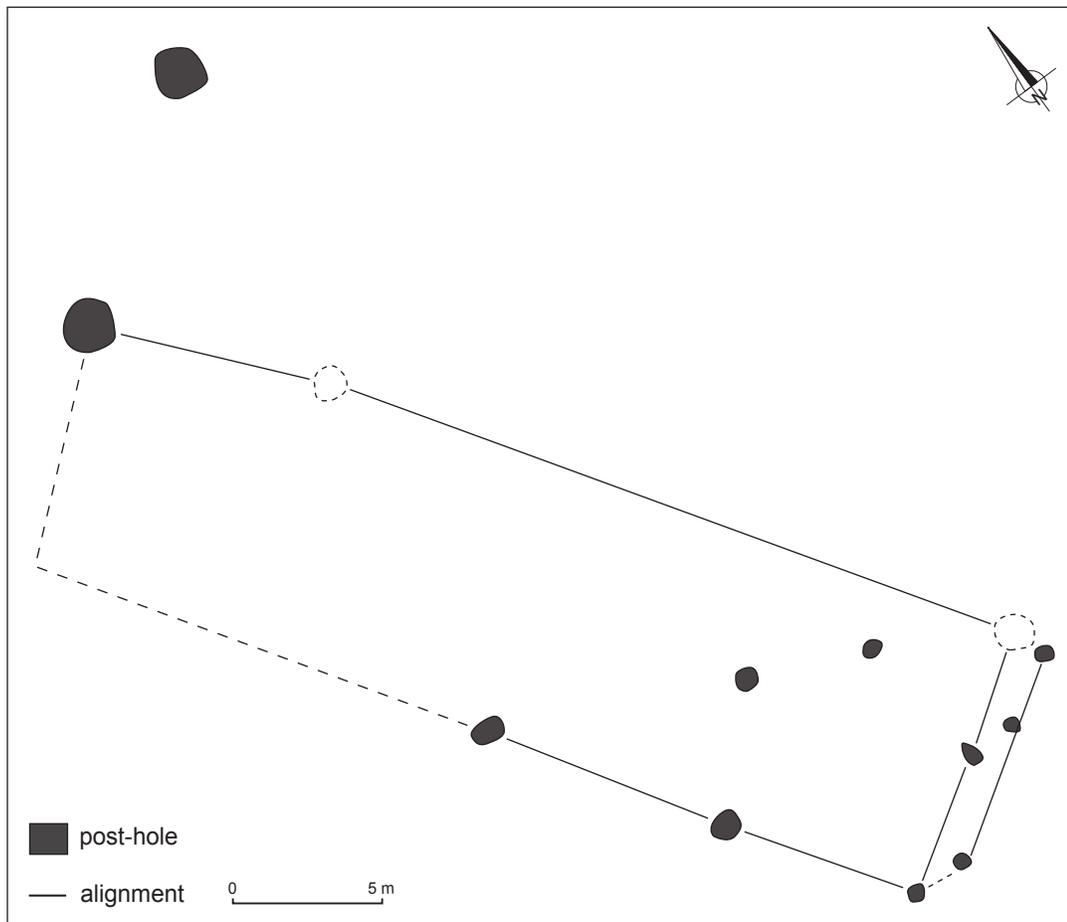


Figure 8.4: Plan of the Bell Beaker structure at Bevaix 'Le Bataillard' (Neuchâtel, CH) (after Leduq et al. 2008, 87)

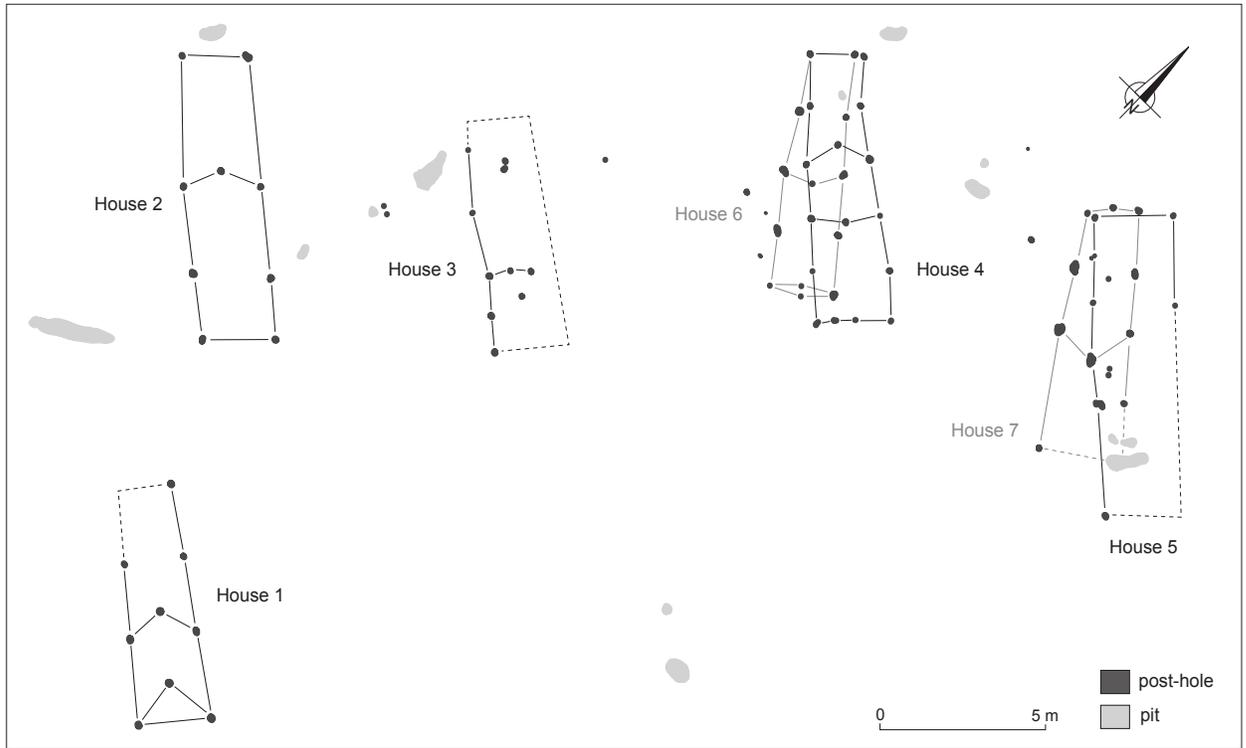
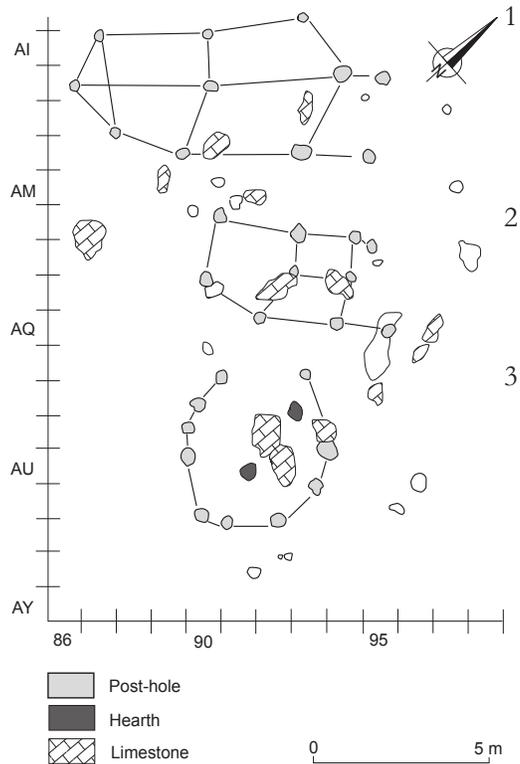


Figure 8.5: Plan of the seven Bell Beaker structures at Cortailod 'Sur les Rochettes-Est' (Neuchâtel, CH) (after von Burg 2002, 52)



Figure 8.6: Saint-Marcel 'La Noue' (Saône-et-Loire, F). Wall effect and possible building outline (after Salanova et al. 2005, 47)



phérique Nord' (no. 31) (Fig. 8.8) is situated on a low terrace at the confluence of the Saône and the Rhône valleys and the Bell Beaker level yielded a single building plan. The posts of the structure were held in place through a support system of rocks and the overall plan measured 4×7 m. To the North lay activity areas involving heat or cooking, as well as waste disposal pits (Vital 2007).

The Bell Beaker settlement of Rances 'Champ-Vully' (no. 44) (Fig. 8.9) is situated on a moraine ledge between the Jura and the plain of Orbe (Gallay & Baudais 1985) and at this site five rectangular buildings belong to two successive phases (Besse 2003b). A post-built structure outlined an area of 3.5×6 m. The other buildings were probably built using a sill-beam technique combined with post supports, as presented above (Besse 2003b).

As well as open settlement sites, a few cave occupations attributed to the Bell Beaker culture are known in the study area. This is the case for example for the cave of Roche à Courchapon (Doubs), of Gigny (Jura), of

Figure 8.7: *Géovreissiat/ Montréal-la-Cluse 'Derrière-le-Château' (Ain, F). 1 – Apsidal ended building; 2 – Rectangular structure; 3 – Subcircular structure (after Bailly et al. 1998, 228)*

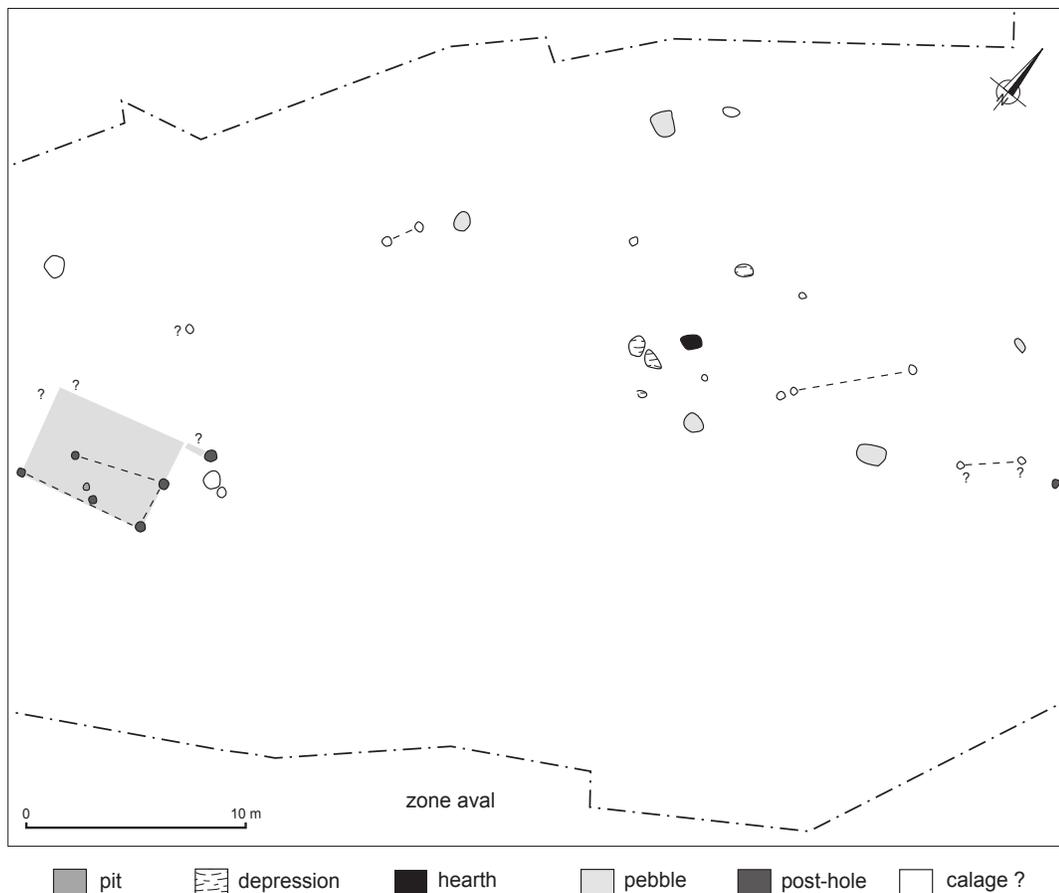


Figure 8.8: *Plan of the Bell Beaker structures at Lyon 'Boulevard périphérique Nord' (F) (after Vital 2007, 73)*

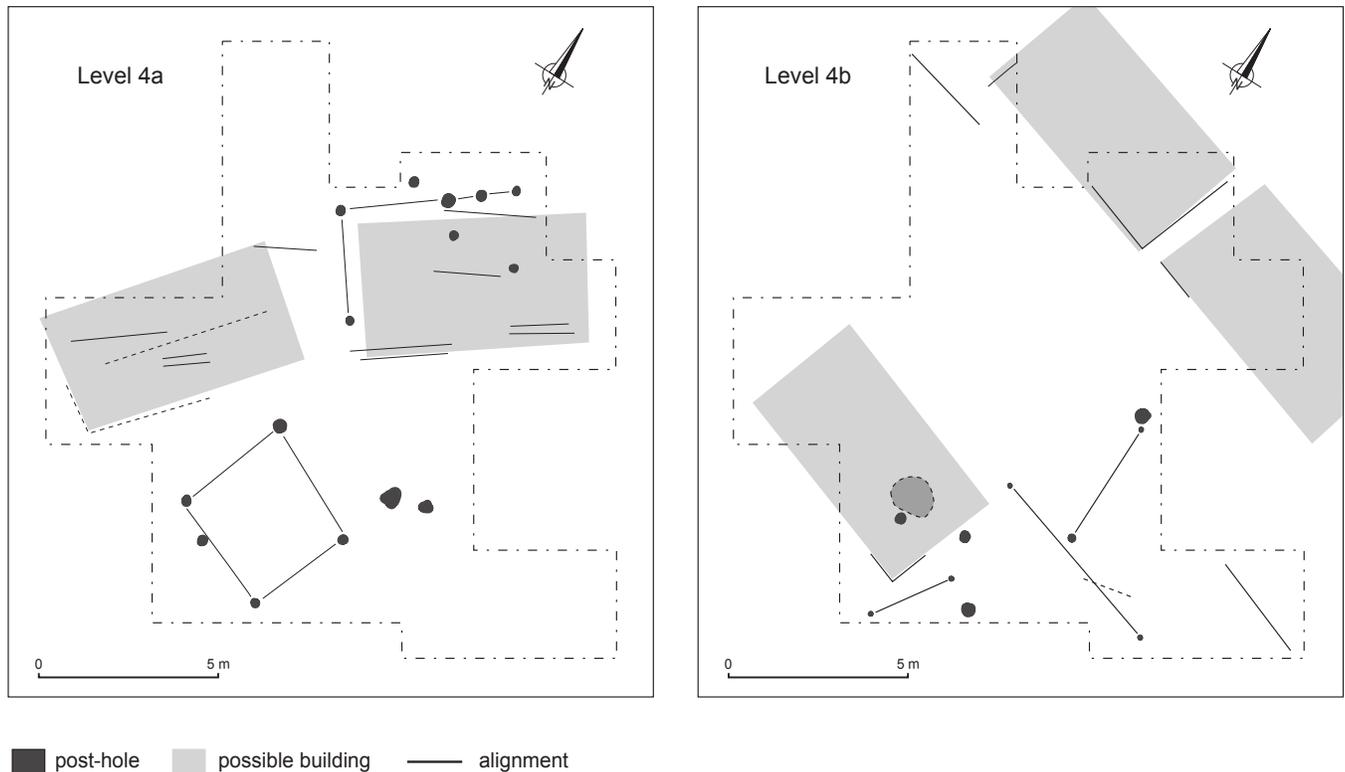


Figure 8.9: Schematic plan of the Bell Beaker levels at Rances 'Champ-Vully' (Vaud, CH) (after Gallay & Baudais 1985, 100)

Margot at Montrond (Jura) (Pétrequin & Pétrequin 1978), as well as Scey-en-Varais (Pétrequin & Piningre 1970) and at the Grotte du Gardon (Voruz *et al.* 2004).

Towards a synthesis of settlement models?

As previously stated, Bell Beaker settlements in central-eastern France and western Switzerland are not well understood. The data produced by the most informative sites show the extent to which architecture and orientation can vary. Some recurring features, however, deserve to be mentioned.

The first concerns the environment in which these settlements were established. All are located close to water, a river in most cases, or a lake for the sites of the Swiss Plateau, but they are not within wetland zones. The second concerns the type of architecture and in the majority of cases the structures are built on posts, without stone foundations. Two cases of mixed architecture, with both sill-beams and posts, have been observed on sites located within potential flood zones (Saint-Marcel 'La Noue' and Rances 'Champ-Vully'). The third observation concerns the size of the structures.

Their width is particularly homogenous: between 3.5–4.5 m with the exception of Saint-Marcel 'La Noue'. It is worth noting, however, that this particular site had no post-holes, and that the architectural remains were defined using possible traces of sill-beams and the spatial distribution of archaeological material. The lengths of the buildings, on the other hand, varies between 6–17 m. The buildings at two sites located North of Lake Neuchâtel (Bevaix 'Le Bataillard' and Cortaillod 'Sur les Rochettes-Est') have produced the longest buildings measuring 13–17 m. The plans and dimensions of the buildings are therefore comparable to what we know of the pile dwelling settlements of the final Neolithic phases (see above).

Within the sites, there is often a unity of building forms in that the plans are rectangular with the only variations comprising a rectangular structure with apsidal ends, and a subcircular structure with dimensions varying from 6–14 m being those at Géovreissiat/Montréal-la-Cluse 'Derrière-le-Château'.

Breaks and continuity

This review of the pre-Bell Beaker and Bell Beaker culture settlements of central-eastern

France and western Switzerland allows us to make several statements. Firstly, the pile-dwelling villages known during the final Neolithic in the cultures of Chalain, Lüscherz, and Auvernier-Cordé are systematically abandoned shortly after 2450 BC (Mauvilly & Boisaubert 2005; Besse *et al.* 2011), and replaced by terrestrial sites during the Bell Beaker period. The arrival of this new culture is marked by a voluntary delocalisation towards terrestrial sites. There is therefore a distinct break between the final Neolithic and the Bell Beaker period. This phenomenon can be generalised to the entire region, and has also been observed in the French Alps (Billaud & Marguet 2005; 2007). It used to be believed that the lakes were abandoned due to rising water levels however the current climatic data show that the second half of the 3rd millennium BC corresponds to a climatic optimum, and therefore to improved conditions favourable to the establishment of on-shore settlements (Magny 2006).

It is worth mentioning that whilst this break is very marked, especially on the Swiss plateau, Bell Beaker settlements established north of Lake Neuchâtel tend to retain some characteristics of the Lüscherz and the Auvernier-Cordé type settlements namely that the buildings are always built using three rows of posts, and have similar dimensions. A width of around 4 m seems to have been the standard for several centuries, and the lengths of the buildings are comparable for the pre-Bell Beaker (10–20 m) and the Bell Beaker periods (13–17 m).

These parallels cannot be drawn for the other regions in our study area, since the settlements of pre-Bell Beaker cultures are not very well known. The few identified floor plans are similar to those of the Bell Beaker culture in that they are square to rectangular in shape. The locations of the sites, along the principal waterways, do not change.

Moreover, in western Switzerland, the analysis of data from funerary sites can be compared and contrasted to the data deduced from domestic structures. Whilst the settlements undergo a major change in the choice of location, continuity is observed in the cemetery of Sion ‘Petit-Chasseur’. Indeed, this megalithic necropolis was constructed and used by both the final Neolithic (‘Néolithique final Valaisan’) and the Bell Beaker populations,

with the latter not only re-using the structures built during the final Neolithic but adding their own funerary structures to the site (Desideri & Besse 2009).

An important break is also seen in the ceramic record, since it is the decorated Bell Beakers that define the Bell Beaker culture. It is worth noting, however, that the cultural groups of the final Neolithic each had their own pottery assemblages with their own characteristics. As for domestic ceramics in the Bell Beaker period, the assemblages were composed of styles that had already been present in the final Neolithic, such as vessels with horizontal cordons below the rim. New types of pottery also appear during the Bell Beaker period, such as vessels with perforations below the rim or with impressed fingernail decoration (Besse 2003a).

It must be stressed once more that it is not possible to identify breaks or continuums in the establishment of the Bell Beaker culture based on the domestic structures alone. They certainly constitute an important part of this process, but must be considered alongside other strands of data. Of particular importance in this regard is the diffusion of Grand-Pressigny flint daggers during the final Neolithic, yet they are absent during the Bell Beaker period. The lithic industry during the latter is characterised by semi-circular elements, arrowheads with concave bases and small thumbnail scrapers which are items that are not found in final Neolithic contexts. Copper artefacts, by contrast, are abundant during the final Neolithic in the Trois-Lacs region of the Swiss plateau, but rare during the Bell Beaker period and represented solely by awls found in funerary contexts.

Conclusion

Central-eastern France and western Switzerland is geographically located in the central part of the Bell Beaker distribution and the cultural groups that preceded the Bell Beakers occupy a small region, linked to the western half of this distribution. With the appearance of Bell Beakers, several other cultural components also appear such as some common ceramic types, the Palmela arrowhead, the archer’s wrist guard, v-shaped perforated buttons, needle-shaped pendants, stelae and so on. The distribution of these Beaker-associated artefacts can,

however, be quite varied. The Palmela points, for example, are found mostly in the Iberian peninsula and in south-west France, and have no connection with the northern part of the Bell Beaker extension. These artefact distributions can overlap, can be found in adjacent areas, or can be completely separated and each of these distributions represents a network. It is the combination and interaction of all these networks that constitute the Bell Beaker phenomenon which can therefore be defined as a mosaic of networks differing from one another but linked by the presence of Bell Beakers themselves.

Through artefacts studies we know that the majority of these objects are made and used locally and the same goes for the standard decorated Bell Beaker. It is therefore the 'concept' of the decorated Beaker that circulated, and not the pottery itself. This concept was transported by people, leading to the conclusion that the networks represent channels of diffusion.

The only point left to address is that of the mechanics of the transmission of this concept. The mobility of the population(s) must therefore be scrutinised and evaluated. The study of non-metric dental traits and aDNA on numerous populations, from the final Neolithic, Bell Beaker culture, and Bronze age, in several areas of Europe, demonstrates the various peopling scenarios possible (Desideri & Besse 2009; Desideri *et al.* 2012; Olalde *et al.* 2018). Ranging from a colonisation event and a process of gradual acculturation, the proposed models confirm the complexity of the establishment of the Bell Beaker culture. These results are corroborated by the timely isotopic analysis of strontium in Central Europe, in England (most famously on the Amesbury archer (Fitzpatrick 2011)) and in the Alps.

The transmission of the 'Bell beaker concept' to the generations responsible for its expansion should be understood in two ways, the first being a vertical transmission of knowledge between generations, or between people living in the same place but with a consequent age difference. The tradition was then maintained over time by repeated transmission to assure its permanence over one, two, or several centuries. Secondly, there must have been a horizontal transmission (multiple, rapid, and repeated) between people

of the same or almost the same generation. The vertical and horizontal models can be combined.

This of course makes it difficult to identify schisms and continuums between the final Neolithic and the Bell Beaker period in central-eastern France and western Switzerland. The vectors are multiple, and complex, as is the case whenever and wherever the Bell Beaker phenomenon is studied. There is no centralised production of Bell Beakers. There is not one single economic network, and the phenomenon cannot be attributed to one population. The diversity of the cultural components of the Bell Beaker phenomenon and the mechanics of its transfer demonstrate the complexity of the network mosaic that governed the societies of the 3rd millennium BC. The region of central-eastern France and western Switzerland is at the very heart of these networks, with the establishment of settlements attesting political choices, including the settlement shift from lakesides dwellings to dryland locations. The architectural form of the domestic structures, on the other hand, remains the same from the final Neolithic to the Bell Beaker culture which demonstrates a similar social ordering in villages, based on the same house-centred unity, during these periods.

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