

## Los emplazamientos topográficos de poblados durante el Tercer Milenio A.C. en la Europa Occidental: Líneas comparadas entre Cataluña y la Provenza

### *Topographic locations of settlements during the third millennium BCE in Western Europe: comparing trends in Catalonia and Provence*

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#### Abstract

In several European regions, an abrupt change in settlement pattern dynamics was thought for years to be contemporaneous with the spread of the Bell Beaker phenomenon. The aim of this paper is to propose a comparative analysis on topographic locations based on third millennium BCE settlements in two nearby Mediterranean regions: Catalonia (northeast Spain) and Provence (southeast France). These domestic establishments contain a significant amount of Bell Beaker pottery, amongst other artefacts, which balances its classical renown in sepulchral environment. Questioning the presence of these specific remains in these domestic deposits, the Bell Beaker overlapping the various local traditions, still appears as a crucial issue. The study reveals some changing trends in settlement choices for the Late Neolithic/Early Bronze Age transition in these two North West Mediterranean regions, but underlines at the same time, the lack of reliable classification frameworks to produce any historical discourse about the spread of Bell Beakers.

**Keywords:** Topographic locations, late third millennium BCE, Bell Beaker, Catalonia, Provence

#### Résumé

Dans plusieurs régions européennes, on a longtemps pensé qu'un changement abrupt s'était produit dans les dynamiques de peuplement avec la diffusion du phénomène campaniforme. Le but de cet article est de proposer une analyse comparative des implantations topographiques des gisements du troisième millénaire av. n. è., dans deux régions méditerranéennes voisines : la Catalogne (nord-est de l'Espagne) et la Provence (sud-est de la France). Ces établissements domestiques présentent une quantité significative de céramiques campaniformes, parmi d'autres artefacts, ce qui relativise sa renommée classique en contexte sépulcral. En questionnant la présence de ces vestiges spécifiques dans les habitats, le Campaniforme, imbriqué dans les différentes traditions locales, se pose toujours comme un problème majeur. L'étude révèle des tendances changeantes dans les choix de peuplement pour la transition entre la fin du Néolithique et l'âge du Bronze ancien, dans ces deux régions de Méditerranée nord-occidentale, tout en soulignant l'absence de cadres de classification fiables permettant de produire un discours historique sur la propagation du Campaniforme.

**Mots-clés:** Emplacement topographique, fin du troisième millénaire avant notre ère, Campaniforme, Catalogne, Provence.

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## INTRODUCTION

In the literature, the Bell Beaker is usually embodied by the figure of the warrior, especially through the grave goods such as decorated Bell Beaker ceramics, copper dagger, barbed and tanged arrowheads, bowman wrist-guard element, V-perforation buttons. However, the Bell Beaker does not reflect a monolithic cultural “identity” but rather a real social mix at regional level that involves constant interactions between collective and individual representations.

The spread of the Bell Beaker in Late Neolithic Europe provides one of the most puzzling examples about settlements patterns and changes in site location choices across the landscape during the third millennium BCE. Indeed, this spread across central and western Europe is frequently perceived as a global and dramatic change marking the transition between the Late Neolithic and the Early Bronze Age, like the recent results of genetic studies have revealed the great mobility of Bell Beaker people (Haak *et al.*, 2015 ; Olalde *et al.*, 2018).

However, it is imperative to adopt a more balanced vision as there is also widespread evidence of continuity in the material culture of Bell Beaker regional groups throughout western and central Europe. For instance, generally speaking, except in Hungary, it can be said that there is no typical Bell Beaker architecture model: in fact, there is a so great variability in domestic constructions, that it can be compared with the diversity found in the common Bell Beaker ceramics (Besse y Desideri, 2005 ; Vander Linden, 2006: 166). When architecture recorded in settlements with Bell Beaker, the Bell Beaker groups either used earlier architectural solutions or re-used old constructions.

In this paper, we develop a basic comparative approach of topographic locations in two similar regions of the north-western shore of the Mediterranean: Catalonia, in northeast Spain and Provence in southeast France. Both regions provide sufficient data and site lists and several authors have already showed the likeness of Bell Beaker ceramics from Catalonia and Provence (Courtin, 1974; Guilaine, 2004; Lemerrier, 2004)

### 1. PRELIMINARY ASSESSMENTS OF THE “BELL BEAKER” IN THE MEDITERRANEAN SOUTH-WESTERN EUROPE

#### 1.1. A still misunderstood emergence and propagation

First, it is important to consider some preliminary assessments of the Bell Beaker in Mediterranean

southwestern Europe. Beyond its well-known late third millennium BCE material culture (inverted bell-shaped profile pottery, copper daggers, “wrist-guard archer”, barbed and tanged arrowheads and V-perforated buttons), the emergence and the spread of the Bell Beaker are still widely misunderstood. In spite of the development of a comprehensive set of analytical methods for the study of Bell Beaker material (decorated ware, common ware, pottery techniques, etc.), the question of the propagation of this material culture across Europe has become increasingly complex and the origin of the “phenomenon” still is a highly debated question since more than a century.

However, it seems obvious that, to some extent, the spread of the Bell Beaker entails the movement of people. Since the end of nineteenth century, the Bell Beaker has been considered as a “dynamic phenomenon” and several theories have been advanced, based on different scales of mobility, summed up well by R. J. Harrison (1974). As L. Salanova (2003) recalls, researchers focused mainly on the origins of this European phenomenon, some of them suggesting an Iberian Peninsula homeland, others preferring an origin in the Netherlands. At the present time, while the traditional theories about Bell Beaker migrating populations carrying and diffusing innovations such as copper metallurgy have been put aside<sup>1</sup>, current interpretations highlight putative mobility networks fuelling the spread of the Bell Beaker throughout Western Europe (Pearson *et al.*, 2016: 634) and accounting for population renewal in Southern France, Hungary and Switzerland from the Iberian Peninsula (Price *et al.*, 2004; Desideri y Besse, 2010, Desideri, 2011: 159-168). As the recent paper of I. Olalde *et al.* (2018) points out, “even at local scales, the Beaker complex was associated with people of diverse ancestries”.

Another problematic point is the existing chronological framework: in general, it is difficult to claim that the typological sequences are valid when checked at the stratigraphic and chronologic levels. In Bell Beaker sites in the southeast of France and Catalonia, sherds from a single layer sometimes include all the pottery types from the classical Bell Beaker typochronology published thirty years ago (Guilaine, 1984), and thus can neither be assigned to a reliable stratigraphic context nor confirm present-day chronological classifications. In North-Western Europe, particularly in the Iberian Peninsula, P. Ríos Mendoza (2011) deplors the scarcity of dating in Chalcolithic domestic contexts and the lack of well-defined vertical

<sup>1</sup> Already suggested by J. Courtin for Provence in the 1970s (Courtin, 1974) and evoked later by J. Guilaine; J. Vaquer (1979) for the Languedoc region, recent studies show that first metallurgy in southern France occurs during the late fourth millennium BCE, several centuries before the Bell Beaker period (Ambert *et al.*, 2005 ; Sohn *et al.*, 2008). In

the western Iberian Peninsula, metallurgy is present since the end of the fourth millennium BCE (Tavares da Silva y Soares, 1998 ; Hanning *et al.*, 2010). In the north-western Alpine foreland, the Bell Beaker culture does not seem to have any influence on the development of metallurgy (Cattin, 2008).

stratigraphy sites. Moreover, “in the majority of the Galician deposits in which the Bell Beaker appears, there is a mix of styles from the middle of the third millennium BCE” (Ríos Mendoza *et al.*, 2011-2012: 199). In addition, in Galicia, the study of the stylistic tendencies of the Bell Beaker collections leads M. P. Prieto Martínez to conclude that each of the four identified tendencies are found between 2800-2600 and 1600-1400 cal BCE and that “neither the typologies used nor the ceramic variants are indicative at the chronological level” (Prieto Martínez, 2011: 358).

For that reason, in Provence for example, on a corpus of 86 Bell Beaker sites (Fig. 1; Fig. 2), only 20 % have a clear stratigraphic context, that is to say, a documented and reliable context or from a strict closed set (interest of data available Level 4 or 5, from O. Lemerrier, 2004). 45 % of Provençal Bell Beaker sites have a confused stratigraphic context, that is to say, a documented context with mixing possibilities (interest

of data available Level 3, from O. Lemerrier, 2004). And finally, 35 % have an uncertain stratigraphic context, that is to say, an uncertain Bell Beaker attribution, localization or attribution problems or marginal presence (interest of data available Level 0 to 2, from O. Lemerrier, 2004).

The question is even more disconcerting when we take into account the occurrence of Late Neolithic artefacts. In fact, the archaeological remains from many late third millennium BCE settlements in Catalonia and the South of France generally seem to belong to the same unclear archaeological strata. For instance, we have to note that the major part of the stratigraphic information at La Fare (Forcalquier, Alpes-de-Haute-Provence) is still misunderstood and has not been yet published. Some archaeological structures considered as part of a large dwelling are quite unusual and the Bell Beaker occupation is attested by an interesting but very unconventional single burial (Lemerrier *et al.*, 2011).

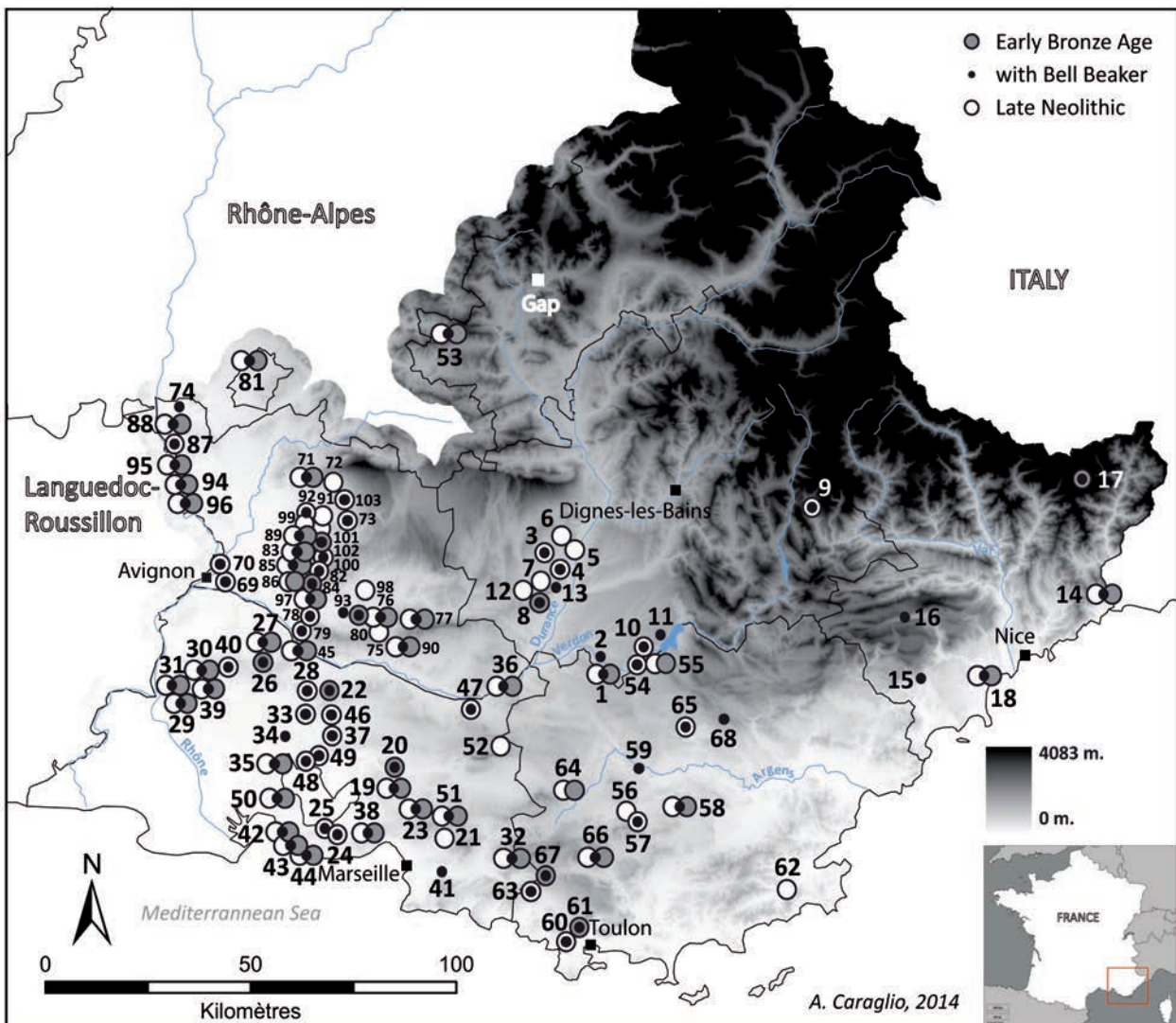


Fig. 1. Map of the third millennium BCE selected sites for Provence region (southeast France). The numbers match with Fig. 2.

Key	Settlement	Department	Town	Settlement type	Topography	Elevation	Accessibility	International and derivatives Bell Beaker Styles	Rhône-provençal Bell Beaker Style
1	Aven Vaudaire	Alpes-de-Haute-Provence (04)	Esparron sur Verdon	Cavity	Valley	448	Difficult		X
2	Baume de l'Eau	Alpes-de-Haute-Provence (04)	Esparron sur Verdon	Cavity	Valley	374	Difficult		X
3	La Fare	Alpes-de-Haute-Provence (04)	Forcalquier	Open air	Minor prominence	608	Medium	X	
4	Le Champ du Roi	Alpes-de-Haute-Provence (04)	La Brillanne	Open air	Valley	374	Medium		X
5	Abri des Bérards	Alpes-de-Haute-Provence (04)	Lurs	Cavity	Valley	420	Easy		
6	Stations des Bérards	Alpes-de-Haute-Provence (04)	Lurs	Open air	Minor prominence	435	Medium		
7	Station de Treilles	Alpes-de-Haute-Provence (04)	Mane	Open air	Plain	446	Easy		
8	Vallon de Gaudé	Alpes-de-Haute-Provence (04)	Manosque	Open air	Hillside	453	Easy		
9	Grotte de Pertus II	Alpes-de-Haute-Provence (04)	Méailles	Cavity	Hillside	1077	Medium		X
10	Grotte Murée	Alpes-de-Haute-Provence (04)	Montpezat	Cavity	Valley	445	Medium		X
11	Abri du Jardin du Capitaine	Alpes-de-Haute-Provence (04)	Sainte Croix du Verdon	Cavity	Valley	454	Medium		X
12	Station de Gayol	Alpes-de-Haute-Provence (04)	Saint-Michel-de-l'Observatoire	Open air	Plain	539	Easy		
13	Oppidum de la Roche Amère	Alpes-de-Haute-Provence (04)	Villeneuve	Open air	Clear prominence	584	Medium		X
14	Abri Pendifmon	Alpes-Maritimes (06)	Castellar	Cavity	Hillside	723	Difficult	X	X
15	Usine Chiris	Alpes-Maritimes (06)	Grasse	Open air	Minor prominence	257	Medium		
16	Abri Martin	Alpes-Maritimes (06)	Gréolières	Cavity	Hillside	882	Medium		X
17	Gias del Giari	Alpes-Maritimes (06)	Tende	Cavity	Hillside	2147	Difficult	X	X
18	Réemetteur ou Station de la Fenouillère	Alpes-Maritimes (06)	Villeneuve-Loubet	Open air	Minor prominence	100	Medium	X	X
19	Abri des Fours	Bouches-du-Rhône (13)	Aix-en-Provence	Cavity	Hillside	164	Easy		X
20	Clos Marie-Louise	Bouches-du-Rhône (13)	Aix-en-Provence	Open air	Clear prominence	135	Medium		
21	Le Pilon du Roy	Bouches-du-Rhône (13)	Allauch	Open air	Minor prominence	267	Medium		
22	La Coste	Bouches-du-Rhône (13)	Alleins	Open air	Hillside	261	Easy		
23	Le Baou-Roux	Bouches-du-Rhône (13)	Bouc-Bel-Air	Open air	Clear prominence	285	Medium	X	
24	Le Débousadou ou Grotte du Déversoir	Bouches-du-Rhône (13)	Châteauneuf-lès-Martigues	Cavity	Clear prominence	135	Medium	X	
25	Le Fortin du Saut	Bouches-du-Rhône (13)	Châteauneuf-lès-Martigues	Open air	Clear prominence	146	Difficult	X	
26	Baume Farnet	Bouches-du-Rhône (13)	Eygalières	Cavity	Clear prominence	250	Medium	X	
27	Station du Château	Bouches-du-Rhône (13)	Eygalières	Open air	Minor prominence	103	Easy		
28	Les Barres	Bouches-du-Rhône (13)	Eygalières	Open air	Hillside	138	Medium	X	X
29	Station de la Calade	Bouches-du-Rhône (13)	Fontvieille	Open air	Minor prominence	8	Easy		X
30	Station d'Estoublon	Bouches-du-Rhône (13)	Fontvieille	Open air	Plain	65	Easy	X	
31	Station du Castelet	Bouches-du-Rhône (13)	Fontvieille	Open air	Minor prominence	12	Easy	X	X
32	Grande Baume	Bouches-du-Rhône (13)	Gemenos	Cavity	Clear prominence	738	Medium	X	X
33	Station du Baou Major ou du Beaumajour	Bouches-du-Rhône (13)	Grans	Open air	Clear prominence	80	Easy	X	X
34	Toupiquères	Bouches-du-Rhône (13)	Grans	Open air	Plain	60	Easy	X	X
35	Mouvin	Bouches-du-Rhône (13)	Istres	Open air	Minor prominence	103	Medium		X
36	Le Mourre de la Barque	Bouches-du-Rhône (13)	Jouques	Cavity	Hillside	296	Difficult	X	X
37	Château-Virant	Bouches-du-Rhône (13)	Langon-de-Provence	Open air	Clear prominence	163	Difficult		X
38	Le Camp de Laure	Bouches-du-Rhône (13)	Le Rove	Open air	Clear prominence	152	Medium		
39	Escanin I et II	Bouches-du-Rhône (13)	Les Baux-de-Provence	Open air	Clear prominence	160	Medium	X	X
40	Station du Rocher	Bouches-du-Rhône (13)	Les Baux-de-Provence	Open air	Clear prominence	207	Medium	X	
41	Saint-Marcel - Abri de la Tourette	Bouches-du-Rhône (13)	Marseille	Cavity	Clear prominence	127	Medium		X
42	Ponteau-Gare	Bouches-du-Rhône (13)	Martigues	Open air	Minor prominence	39	Easy		X
43	Village de Saint-Pierre	Bouches-du-Rhône (13)	Martigues	Open air	Minor prominence	62	Medium	X	
44	Le Collet-Redon	Bouches-du-Rhône (13)	Martigues-La Couronne	Open air	Hillside	39	Easy		X
45	Les Calades 1 et 2	Bouches-du-Rhône (13)	Orgon	Open air	Clear prominence	213	Difficult	X	
46	Saint-Laurent-de-Cabardel	Bouches-du-Rhône (13)	Péllissanne	Open air	Plain	80	Easy		X
47	La Bastide Blanche	Bouches-du-Rhône (13)	Peyrolles	Open air	Minor prominence	272	Medium		X
48	Abri Emile Villard	Bouches-du-Rhône (13)	Saint-Chamas	Cavity	minor prominence	104	Easy	X	
49	Le Collet du Verdon	Bouches-du-Rhône (13)	Saint-Chamas	Open air	Minor prominence	120	Easy		X
50	Oppidum de Saint-Blaise	Bouches-du-Rhône (13)	Saint-Mitre-les-Remparts	Open air	Minor prominence	53	Medium		X
51	Le Col Sainte-Anne	Bouches-du-Rhône (13)	Simiane-Collogne	Open air	Clear prominence	663	Difficult	X	X
52	La Citadelle	Bouches-du-Rhône (13)	Vauvenargues	Open air	Clear prominence	711	Difficult		
53	Le Col des Tourettes	Hautes-Alpes (05)	Montmorin	Open air	Clear prominence	936	Difficult		
54	Abri de la Plage	Var (83)	Baudinard	Cavity	Valley	440	Difficult		X
55	La Grotte de l'Eglise	Var (83)	Baudinard	Cavity	Valley	575	Difficult		
56	Le Plan-Saint-Jean	Var (83)	Brignoles	Open air	Plain	228	Easy		
57	Gazoduc-Le Val AO-616	Var (83)	Brignoles	Open air	Plain	220	Easy		X
58	La Grande pièce	Var (83)	Cabasse	Open air	Plain	216	Easy		X
59	Abri Sous Ville	Var (83)	Correns	Cavity	Valley	160	Easy		X
60	Grotte de Saint Martin 1	Var (83)	Evenos	Cavity	Valley	60	Medium		X
61	Station de Sainte-Estève ou du Bottin	Var (83)	Evenos	Open air	Clear prominence	167	Difficult	X	
62	Satation de Maravielle	Var (83)	La Môle	Open air	Clear prominence	240	Medium		
63	Abri de Roche-Ronde	Var (83)	Le Castellet	Cavity	Hillside	330	Difficult		X
64	Le Chemin d'Aix	Var (83)	Saint-Maximin-La-Sainte-Baume	Open air	Plain	300	Easy		
65	Baume de Fontbregouas	Var (83)	Salernes	Cavity	Hillside	385	Difficult		X
66	La Bergerie des Maigres	Var (83)	Signes	Cavity	Valley	744	Medium	X	X
67	Grotte du Vieux Mounoi	Var (83)	Signes	Cavity	Minor prominence	429	Medium		X
68	Saint-Pierre	Var (83)	Tourtour	Open air	Hillside	654	Medium		X
69	La Balance et Rue Ferruce	Vaucluse (84)	Avignon	Open air	Plain	19	Easy	X	
70	La Place du Palais	Vaucluse (84)	Avignon	Open air	Plain	20	Easy	X	
71	Abri de la Madeleine	Vaucluse (84)	Bédoin	Cavity	Clear prominence	477	Difficult		X
72	Le Limon-Raspail	Vaucluse (84)	Bédoin	Open air	Hillside	348	Easy		
73	Les Aubes	Vaucluse (84)	Blauvac	Open air	Plain	264	Easy		X
74	Les Bartras 4	Vaucluse (84)	Bollène	Open air	Plain	46	Easy		X
75	Les Safraniers	Vaucluse (84)	Bonnieux	Open air	Plain	288	Easy		
76	Les Fabrys	Vaucluse (84)	Bonnieux	Open air	Plain	179	Easy		X
77	La Brémondie	Vaucluse (84)	Boux	Open air	Minor prominence	534	Medium		
78	Baume des Enfers	Vaucluse (84)	Cheval-Blanc	Cavity	Valley	326	Difficult	X	
79	Grande Grotte de Vidauque	Vaucluse (84)	Cheval-Blanc	Cavity	Valley	305	Difficult	X	
80	Irisson	Vaucluse (84)	Goutt	Cavity	Hillside	190	Easy		
81	Hypogée du Capitaine	Vaucluse (84)	Grillon	Cavity	Plain	203	Easy		X
82	Abri 2 de Fraischamp	Vaucluse (84)	La Roque-sur-Pernes	Cavity	Valley	380	Medium		X
83	Abri de la Source	Vaucluse (84)	La Roque-sur-Pernes	Cavity	Valley	300	Easy	X	X
84	La Clairière	Vaucluse (84)	La Roque-sur-Pernes	Open air	Valley	335	Easy		X
85	Station du Lauvier	Vaucluse (84)	La Roque-sur-Pernes	Open air	Minor prominence	362	Medium	X	X
86	Claparouse	Vaucluse (84)	Lagnes	Open air	Plain	125	Easy		
87	Le Chêne	Vaucluse (84)	Lamotte-du-Rhône	Open air	Plain	43	Easy	X	
88	Les Petites Bâtes	Vaucluse (84)	Lamotte-du-Rhône	Open air	Plain	43	Easy		X
89	La Rouyère	Vaucluse (84)	Le Beaucet	Open air	Valley	261	Easy		X
90	Les Lauzières ou Les Chaux	Vaucluse (84)	Lourmarin	Open air	Clear prominence	332	Medium		X
91	La Tuyère	Vaucluse (84)	Mazan	Open air	Plain	179	Easy		
92	Le Banay	Vaucluse (84)	Mazan	Open air	Plain	150	Easy		X
93	Abri de Soubeyras	Vaucluse (84)	Ménerbes	Cavity	Plain	126	Easy		X
94	Le Duc	Vaucluse (84)	Mondragon	Open air	Plain	40	Easy		
95	Les Jullières	Vaucluse (84)	Mondragon	Open air	Plain	47	Easy		X
96	Les Ribauds	Vaucluse (84)	Mondragon	Open air	Plain	39	Easy		X
97	Station du Boulon	Vaucluse (84)	Robion	Open air	Plain	130	Easy	X	
98	Les Martins	Vaucluse (84)	Roussillon	Open air	Plain	208	Easy		
99	La Rambaude	Vaucluse (84)	Saint-Didier	Open air	Plain	139	Easy		
100	La Grotte de l'Ascde, du Céran ou de Foussargoules	Vaucluse (84)	Venasque	Cavity	Hillside	276	Medium	X	
101	Le Capty	Vaucluse (84)	Venasque	Open air	Plain	226	Easy		
102	Station du Colombier	Vaucluse (84)	Venasque	Open air	Valley	190	Medium		X
103	Le Redon	Vaucluse (84)	Ville-Auzon	Open air	Plain	328	Easy		X

Fig. 2. Selected sites of the third millennium BCE in Provence region (southeast France).

Barbed Wire Bell Beaker Style	Number of Bell Beaker decorated ceramic	Bell Beaker common ware	Late Neolithic ceramic (Cauliez, 2009)	Early Bronze age ceramic	Long flint blade	Nail shaped scraper	Barbed & tanged arrowhead	Metal material	Bell Beaker tendency	Delimitation structure	Archaeological operation type	Stratigraphic context (Lermerrier, 2004)
	2 to 5 vases	Present	Present ?	Present	Present	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Illegal excavations	Confused
	More than 5 vases	Present	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Confused
	1 vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Present	With Bell Beaker	Present	Collecting survey	Uncertain
	1 vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Uncertain
	No vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Collecting survey	Confused
	No vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Excavations	Confused
	No vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Collecting survey	Confused
X	2 to 5 vases ?	Unknown	Unknown	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Confused
	1 vase	Unknown	Present	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
	More than 5 vases	Present	Present	Unknown	Present	Unknown	Present	Present	Bell Beaker	Unknown	Rescue digs	Uncertain
	More than 5 vases	Present	Unknown	Unknown	Unknown	Present	Unknown	Present	Bell Beaker	Unknown	Rescue digs	Uncertain
	No vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Collecting survey	Confused
	1 vase	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused
	More than 5 vases	Present	Phase 3	Present	Unknown	Unknown	Present	Unknown	Bell Beaker	Unknown	Excavations	Clear
X	1 vase	Present	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Confused
	1 vase	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
	1 vase	Unknown	Unknown	Present	Unknown	Unknown	Unknown	Present	With Bell Beaker	Unknown	Excavations	Confused
	1 vase	Unknown	Phase 2	Present ?	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused
	2 to 5 vases	Present	Present	Present	Present	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Uncertain
X	More than 5 vases	Present	Unknown	Present	Unknown	Unknown	Present	Unknown	Bell Beaker	Present	Rescue digs	Clear
	No vase	Unknown	Phases 1 and 2	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Mecanic survey	Clear
X	1 vase	Unknown	Unknown	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Mecanic survey	Clear
X	2 to 5 vases	Unknown	Present	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
	1 vase	Unknown	Phase 2	Unknown	Present	Unknown	Unknown	Present	With Bell Beaker	Unknown	Illegal excavations	Uncertain
	More than 5 vases	Present	Phase 2	Unknown	Unknown	Present	Present	Present	Bell Beaker	Unknown	Mecanic survey	Clear
	1 vase	Unknown	Unknown	Present ?	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Illegal excavations	Confused
X	2 to 5 vases	Unknown	Present	Present ?	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
X	More than 5 vases	Present	Present	Unknown	Present	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
	2 to 5 vases	Unknown	Phase 2	Present	Present	Present ?	Unknown	Present	With Bell Beaker	Unknown	Excavations	Uncertain
X	2 to 5 vases	Unknown	Present	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused
	2 to 5 vases	Unknown	Phase 2	Present	Present	Unknown	Present	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
	More than 5 vases	Present	Present	Present	Present	Unknown	Present	Unknown	Bell Beaker	Unknown	Excavations	Clear
	2 to 5 vases	Unknown	Phase 2	Unknown	Unknown	Unknown	Present	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused
	1 vase	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused
X	More than 5 vases	Present	Phase 1	Present	Unknown	Unknown	Unknown	Present	With Bell Beaker	Present	Excavations	Uncertain
	2 to 5 vases	Unknown	Present	Present	Unknown	Unknown	Present	Unknown	With Bell Beaker	Unknown	Excavations	Clear
X	More than 5 vases	Present	Phase 2	Present	Unknown	Unknown	Unknown	Present	With Bell Beaker	Unknown	Excavations	Uncertain
X	More than 5 vases	Present	Phase 1	Present	Present	Unknown	Unknown	Present	With Bell Beaker	Present	Excavations	Clear
	More than 5 vases	Present	Phase 2	Present	Unknown	Present	Present	Present	Bell Beaker	Unknown	Excavations	Clear
	2 to 5 vases	Unknown	Present	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused
	2 to 5 vases	Unknown	Phase 3	Unknown	Present	Unknown	Unknown	Present	With Bell Beaker	Unknown	Excavations	Clear
	More than 5 vases	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
X	2 to 5 vases	Unknown	Phase 2	Unknown	Unknown	Present	Present	Unknown	With Bell Beaker	Unknown	Mecanic survey	Confused
X	2 to 5 vases	Unknown	Phase 2	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
X	More than 5 vases	Present	Present ?	Present	Unknown	Unknown	Present	Present	Bell Beaker	Unknown	Excavations	Uncertain
	No vase	Unknown	Phases 1 and 2	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Present	Excavations	Clear
X	1 vase	Unknown	Present	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Clear
	2 to 5 vases	Present ?	Present	Unknown	Unknown	Unknown	Present	Unknown	With Bell Beaker	Unknown	Excavations	Confused
	No vase	Unknown	Present	Present ?	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Excavations	Confused
	No vase ?	Unknown	Phase 3	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Present	Rescue digs	Clear
	1 vase	Unknown	Phase 3	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Clear
	2 to 5 vases	Unknown	Present	Present ?	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Mecanic survey	Confused
	1 vase	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
	1 vase	Unknown	Unknown	Present ?	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
	1 vase	Unknown	Present	Unknown	Unknown	Unknown	Present	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
	No vase	Unknown	Phase 3	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Mecanic survey	Uncertain
	2 to 5 vases	Unknown	Present ?	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
	No vase	Unknown	Phase 3	Present	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Present	Rescue digs	Clear
	2 to 5 vases	Unknown	Present	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Clear
	2 to 5 vases	Present	Present	Present	Unknown	Present	Present	Unknown	Bell Beaker	Unknown	Excavations	Uncertain
	1 vase	Unknown	Unknown	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
	2 to 5 vases	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused
	More than 5 vases	Unknown	Phase 2	Unknown	Unknown	Present	Present	Present	Bell Beaker	Unknown	Rescue digs	Uncertain
	More than 5 vases	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Clear
	1 vase	Unknown	Phase 2	Present ?	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
	No vase	Unknown	Phase 1	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Rescue digs	Clear
X	1 vase	Unknown	Present	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Mecanic survey	Confused
	More than 5 vases	Present	Unknown	Unknown	Present	Unknown	Unknown	Unknown	Bell Beaker	Unknown	Rescue digs	Clear
	No vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Mecanic survey	Clear
	2 to 5 vases	Unknown	Phase 1	Present ?	Present	Unknown	Unknown	Unknown	With Bell Beaker	Present	Rescue digs	Clear
X	1 vase	Unknown	Phase 1	Present	Present	Unknown	Present	Present	With Bell Beaker	Present	Excavations	Uncertain
	1 vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
	2 to 5 vases	Present	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
X	1 vase	Present	Unknown	Present	Unknown	Unknown	Unknown	Unknown	Bell Beaker	Unknown	Mecanic survey	Uncertain
	1 vase	Unknown	Present	Present	Unknown	Unknown	Present	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
	2 to 5 vases	Unknown	Present	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
X	2 to 5 vases	Present ?	Present	Present ?	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
X	1 vase	Present	Unknown	Present	Unknown	Unknown	Present	Unknown	With Bell Beaker	Unknown	Excavations	Uncertain
X	2 to 5 vases	Unknown	Phase 1	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
	No vase	Unknown	Phase 2	Present	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Excavations	Clear
	1 vase	Unknown	Present	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Uncertain
X	More than 5 vases	Present	Present	Present	Unknown	Unknown	Present	Present	Bell Beaker	Unknown	Rescue digs	Uncertain
X	More than 5 vases	Present	Present	Present	Unknown	Unknown	Unknown	Unknown	Bell Beaker	Unknown	Mecanic survey	Confused
X	More than 5 vases	Present	Phase 1	Present ?	Unknown	Unknown	Present	Present	Bell Beaker	Present	Excavations	Uncertain
	No vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Collecting survey	Confused
	1 vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused
	1 vase	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Excavations	Confused
X	2 to 5 vases	Unknown	Present	Present	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Rescue digs	Confused
X	More than 5 vases	Present	Present	Present	Unknown	Present	Unknown	Unknown	Bell Beaker	Present	Rescue digs	Uncertain
	2 to 5 vases	Present	Present	Present ?	Unknown	Unknown	Present	Present	Bell Beaker	Unknown	Rescue digs	Clear
	1 vase	Unknown	Phase 1	Present ?	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Mecanic survey	Confused
	No vase	Unknown	Phase 1	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Rescue digs	Clear
	No vase	Unknown	Phase 1	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Rescue digs	Uncertain
	1 vase	Unknown	Phase 2	Unknown	Unknown	Unknown	Unknown	Unknown	With Bell Beaker	Unknown	Illegal excavations	Confused
	No vase	Unknown	Phase 1	Unknown	Unknown	Unknown	Unknown	Unknown	No Bell Beaker	Unknown	Collecting survey	Confused
X	More than 5 vases	Present	Unknown	Present	Unknown	Unknown	Unknown	Unknown	Bell Beaker	Unknown	Rescue digs	Confused
	2 to 5 vases	Unknown	Present	Unknown	Unknown	Unknown	Present	Unknown	With Bell Beaker	Unknown	Collecting survey	Confused

If the habitats are now better known thanks to the last years' discoveries in several places in Europe (Besse *et al.* 2007), the data concerning the Bell Beaker architectural elements remains tenuous and very diverse and no specific Bell Beaker house model cannot be defined (Lemerrier, 2004: 413; Vander Linden 2006: 166). Furthermore, marked variability in funerary practices (individual or collective burials) in South France would be linked to the persistence of local traditions (Lemerrier y Tchérémissinoff, 2011), as well as the important variability of regional Bell Beaker decorated ceramics.

There is no doubt that culture and traditions could be expressed, exposed and flaunted through ceramic material and burials, but we might argue that the cultural values and practices (ethos) could also be transmitted by settlement forms and types. As A. Coudart (1999) wrote: the analysis of domestic settlement structures (topography, surface, orientation, partition, landscape) could allow us to grasp the "identity substance of all communities". Here, we would focus on a single topic: the dynamics of the topographic locations of the Bell Beaker dwellings in comparison to contemporaneous non-Bell Beaker groups.

These aforementioned considerations lead us to ask exactly what these Bell Beaker domestic settlements are. Should all archaeological sites with some Bell Beaker sherds be considered as Bell Beaker settlements? If not, how can we objectively differentiate "Bell Beaker sites" from "sites with Bell Beaker", when most of the time we only find mixed material from late third millennium BCE cultures?

### 1.2. Bell Beaker settlement relocation in Europe

While we cannot answer these questions directly, the reality of Bell Beaker settlement relocation must be assessed. Evidence of this phenomenon is scant and limited, for instance, to the European regions of Spain (Valencia and Central Meseta), Budapest (Hungary) and the north-western Alpine foreland (Switzerland). Bell Beaker sites seem to circumvent places previously occupied by local groups. In fact, according to the study by C. M. Barton *et al.* (1999 ; 2002) in Alto Polop Valley (Valencia, Spain), the extensive Neolithic IIB sites enclosed by ditches in valleys are located near the best farming soils whereas the Bell Beaker sites are installed on valley sides or on hill tops. In the Central Meseta (Spain), 67 % of the settlements with Bell Beaker artefacts occupy more or less prominent locations in the landscape, with a wide visual control of the environment, and especially the meadows of the rivers, features perhaps less pronounced in the Neolithic and even clearer in the Bronze Age (Garrido Pena, 2000: 47). In the Budapest region, Makó Culture settlements are mostly located in small valleys and plains whereas the Bell Beaker settlements are better represented along the Danube River (Kalicz-Schreiber, 2001). Finally, in the north-western Alpine foreland, in spite of a positive correlation between the density of archaeological sites and

warmer periods (Pétrequin *et al.*, 2005), no Bell Beaker lake dwellings are known (Magny, 1993 ; Magny, 2003 ; Magny, 2004). Indeed, the end of lake dwelling traditions in this region provided an accurate description of a rapid and major phenomenon leading to complete relocation in less than a century. The origin of this relocation pattern remains unknown and the obvious need for protection against raids and attacks may be challenged by other explanations. Nevertheless, such a change in traditional patterns must also entail important social and economic repercussions.

For the southeast of France, these questions have already been mentioned by some scholars. While J. Courtin (1974) notes the importance of rock shelter settlements for regional Bell Beakers, he did not reject the possibility of seasonal tableland villages, while the regional non Bell Beaker dwellings tend to display the opposite pattern. Later, A. D'Anna (1995) suggested that small sites belonging to regional Bell Beaker entity were located in:

- remote places such as Les Calades (Orgon, Bouches-du-Rhône) (Barge, 1989), or with narrow access structures, such as Le Col Saint-Anne (Simiane-Collogue, Bouches-du-Rhône) (Müller, 1989), Le Fortin-du-Saut (Châteauneuf-lès-Martigues, Bouches-du-Rhône) (Gagnière, 1972) and Château-Virant (Lançon-de-Provence, Bouches-du-Rhône) (Lafran *et al.*, 1983);
- rock shelters: Grotte Murée (Montpezat, Alpes-de-Haute-Provence) (Courtin 1974), Abri du Capitaine (Sainte Croix du Verdon, Alpes-de-Haute-Provence) (Gagnière, 1968), Grande Baume (Gémenos, Bouches-du-Rhône) (Courtin y Palun, 1962) or the Abri Pendimoun (Castellar, Alpes-Maritimes) (Binder, 2003).

These settlements located on the fringes of good farming soils (i.e. on "second choice" locations), would tend to demonstrate that "first choice" locations were already inhabited by local groups (D'Anna, 1995). O. Lemerrier (2004) noted that sites with Bell Beaker International styles ceramics tended to be settled on slightly elevated places whereas sites with regional Bell Beaker wares (Rhodano-Provençal style) showed a more even distribution among plains and elevated locations.

### 1.3. Research goal

Therefore, it was appropriate to evoke a possible relocation of Bell Beaker settlements in Catalonia and in the southeast of France, in comparison with the evolution of settlement choices during the Late Neolithic/Early Bronze Age transition. More specifically, is it possible to identify topographic characteristics in the location of settlements with Bell Beaker ceramics in comparison with non Bell Beaker traditions? On what basis can we differentiate "Bell Beaker sites" from "sites with Bell Beaker"? We also address this problem from a quantitative viewpoint and attempt a comparative approach between Catalonia and the South of France.

2. A COMPARATIVE APPROACH FOR TOPOGRAPHIC CHOICES

2.1. Method

2.1.1. Databases and sources

For our Catalan database<sup>2</sup> we browsed the old “Base de Dades Radiocarbònica de Catalunya” website (now the archaeological Database of the Catalan General Directorate of Archives, Libraries, Museums and Heritage website<sup>3</sup>) to gather our own database. This allowed us to select fairly well-known, dated and located settlements, with a sample of 39 sites attributed to the whole of Late Neolithic/Early Bronze Age transition (Fig. 3; Fig. 4). Actually, the

chrono-cultural framework for Catalan Late Neolithic is hardly informative as A. Martín Collíga (2003) notices. Some local ceramic sherds with nipples and smooth bar-shaped handle, sherds with Bell Beaker ornaments or barbed and tanged arrowheads allow to situate *grosso modo* the period, but more concretely, it is difficult to know if, chronologically or technologically, we are faced with the ends of Neolithic or already in the Chalcolithic (Martín Collíga, 2003). Only 36 % of our corpus (14 sites) shows Bell Beaker elements<sup>4</sup>: 9 sites present Pyrenean style (regional Bell Beaker), 4 sites own Barbed Wire style and 3 have indeterminate Bell Beaker style.

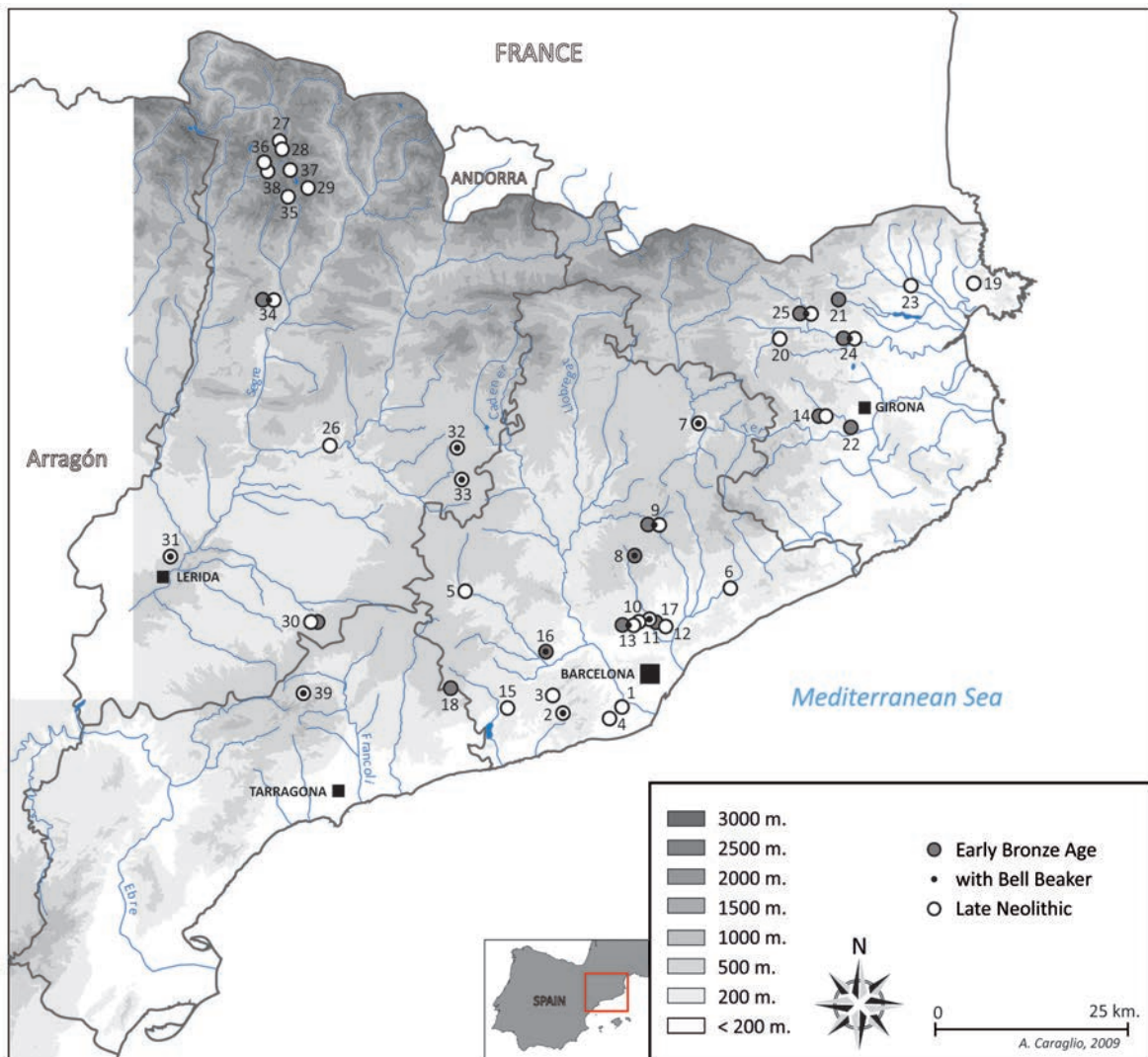


Fig. 3. Map of the third millennium BCE corpus for Catalonia region (northeast Spain). The numbers match with Fig. 4.

<sup>2</sup> Caraglio, A. 2009: *De la fin du Néolithique au début de l'Age du Bronze : pour une approche des dynamiques de peuplement en Catalogne*, Reporte inédito, Aix-Marseille Université/Universidad Autónoma de Barcelona, Aix-en-Provence/Barcelona.

<sup>3</sup> <http://invarque.cultura.gencat.cat/>

<sup>4</sup> 2. Can Sadurní, Barcelona ; 7. Institut A. Pous, Barcelona ;

8. Cova del Frare, Barcelona ; 9. Cova del Toll, Barcelona ; 11. Vapor Gorina, Barcelona ; 13. Bòbila Madurell, Barcelona ; 16. Sitges de la UAB, Barcelona ; 24. Cova d'en Pau, Girona ; 25. Balma del Serrat del Pont, Girona ; 31. Roques del Sarró, Lerida ; 32. Les Portes, Lerida ; 33. Collet de Brics d'Ardèvol, Lerida ; 34. Cueva de Toralla, Lerida ; 39. Molins de la Vila, Tarragona.

Key	Settlement	Province	Town	Settlement type	Elevation	Topography	Bell Beaker Styles	Late Neolithic ceramic	Early Bronze age ceramic
1	Carrer Rieraeta	Barcelona	Barcelona	Cavity	12	Plain	Unknown	Veraza	Unknown
2	Can Sadurni	Barcelona	Begues	Cavity	400	Valley	Undetermined	Veraza	Unknown
3	Can Tintorer	Barcelona	Gavà	Mine	40	Valley	Unknown	Undetermined	Unknown
4	Mines de Gavà	Barcelona	Gavà	Mine	40	Plain	Unknown	Undetermined	Unknown
5	Camp del Rector	Barcelona	Jorba	Open air	370	Valley	Unknown	Veraza	Unknown
6	El Coll	Barcelona	Llinars del Vallès	Open air	280	Clear prominence	Unknown	Veraza	Unknown
7	Institut A. Pous	Barcelona	Manlleu	Open air	470	Plain	Pyrenean	Undetermined	Unknown
8	Cova del Frare	Barcelona	Matadepera	Cavity	975	Minor prominence	Pyrenean and Barbed Wire	Unknown	Present
9	Cova del Toll	Barcelona	Moià	Cavity	770	Hillside	Undetermined	Veraza	Present
10	Can Gambús I	Barcelona	Sabadell	Open air	220	Plain	Unknown	Veraza ?	Unknown
11	Vapor Gorina	Barcelona	Sabadell	Open air	177	Plain	Pyrenean	Undetermined	Unknown
12	Can Vinalets II	Barcelona	Sant Perpètua de Mogoda	Open air	70	Plain	Unknown	Undetermined	Unknown
13	Bòbila Madurell	Barcelona	Sant Quirze del Vallès	Open air	180	Plain	Barbed Wire	Veraza	Present
14	Cova de les Pixarelles	Barcelona	Tavertet	Cavity	97	Valley	Unknown	Veraza	Present
15	Cami de Sta. Maria dels Horts	Barcelona	Vilafranca del Penedès	Open air	220	Plain	Unknown	Undetermined	Unknown
16	Sitges de la UAB	Barcelona	Cerdanyola del Vallès	Open air	130	Plain	Barbed Wire	Unknown	Present
17	Can Roqueta II	Barcelona	Sabadell	Open air	178	Plain	Unknown	Unknown	Present
18	Santa Digna - Pla de la Girada	Barcelona	Vilafranca del Penedès	Open air	210	Plain	Unknown	Unknown	Present
19	Ca n'Isach	Girona	Palau Saverdera	Open air	125	Hillside	Unknown	Veraza	Unknown
20	La Prunera	Girona	Sant Joan les Fonts	Open air	460	Valley	Unknown	Veraza ?	Unknown
21	Cova de la Pólvara	Girona	Albanyà	Cavity	750	Hillside	Unknown	Unknown	Present
22	Carrer Emili Graù - Carrer Ullastret	Girona	Girona	Open air	250	Hillside	Unknown	Unknown	Present
23	Riera de Masarac	Girona	Pont de Molins	Open air	50	Plain	Unknown	Veraza	Unknown
24	Cova d'en Pau	Girona	Serinyà	Cavity	210	Plain	Undetermined	Veraza	Present
25	Balma del Serrat del Pont	Girona	Tortellà	Cavity	230	Valley	Pyrenean and Barbed Wire	Veraza	Present
26	El Coltar	Lerida	Artesa del Segre	Cavity	390	Valley	Unknown	Treilles ?	Unknown
27	Abri de les Obagues de Ratera	Lerida	Espot	Cavity	2322	Valley	Unknown	Veraza ?	Unknown
28	Abri del Portarró	Lerida	Espot	Cavity and Open air	2300	Valley	Unknown	Veraza ?	Unknown
29	Abri de l'Estany de la Coveta I	Lerida	Espot	Cavity	2435	Valley	Unknown	Veraza ?	Unknown
30	Minferri	Lerida	Juneda	Open air	225	Plain	Unknown	Treilles	Present
31	Roques del Sarró	Lerida	Lerida	Cavity	196	Plain	Pyrenean	Undetermined	Unknown
32	Les Portes	Lerida	Lladurs	Cavity	700	Hillside	Pyrenean	Undetermined	Unknown
33	Collet de Bric d'Ardèvol	Lerida	Pinós	Open air	775	Minor prominence	Pyrenean	Undetermined	Unknown
34	Cueva de Toralla	Lerida	Toralla	Cavity	1150	Clear prominence	Pyrenean	Veraza ?	Present
35	Coma d'Espòs	Lerida	Torre de Copdella	Open air	2240	Valley	Unknown	Veraza ?	Unknown
36	Cova de Serradé	Lerida	Vall de Boí	Cavity	2050	Hillside	Unknown	Veraza ?	Unknown
37	Cova del Sardo	Lerida	Vall de Boí	Cavity	1830	Hillside	Unknown	Veraza ?	Unknown
38	Les Covetes	Lerida	Vall de Boí	Cavity	1850	Hillside	Unknown	Veraza ?	Unknown
39	Molins de la Vila	Tarragona	Montblanc	Open air	320	Plain	Pyrenean	Unknown	Unknown

Fig. 4. Third millennium BCE corpus for Catalonia region (northeast Spain).

For our Provençal database<sup>5</sup>, we selected a sample of 103 sites, attributed to this same transition, from three essential academic works (Fig. 1; Fig. 2): the corpus of O. Lemerrier (2004) for the Bell Beaker sites, of J. Cauliez (2009) for the Late Neolithic sites and of the D. Dubesset (2003) for the Early Bronze Age sites. Using the most recently established chrono-cultural framework<sup>6</sup> for Provençal Late Neolithic, we selected a sample of 14 sites belonging to the first phase (around 2900-2850/2600-2550 cal BCE), 29 attributed to the second phase (around 2600-2550/2400-2350 cal BCE), 6 to the third phase (around 2400-2350/1900 cal BCE) and 49 to the Early Bronze Age (after 1900 cal BCE). On this corpus, 84 % (86 sites) have Bell Beaker elements: 29 sites present International and derivatives styles, 59 sites own Rhodano-provençal style and 29 sites have Barbed Wire Style. In relation to the hypothetical Bell Beaker typo-chronology, by O. Lemerrier (2007), International and derivatives Bell Beaker styles would appear between 2500 and 2400 cal BCE, Rhodano-Provençal Bell Beaker style between 2400 and 2300 cal BCE and Barbed Wire Bell Beaker style between 2200 and 2100 cal BCE.

Considering this distribution, we decided to compare the evolution of Late Neolithic settlement loca-

tion with the evolution of Bell Beaker settlement location, in Catalonia and Provence. In the two cases, however, bearing in mind the question of the Bell Beaker chronology, one of the main challenges was to distribute the settlements within a well-defined and accurate chronological and cultural framework.

Geographic coordinates of Catalan sites were collected on the old “Base de Dades Radiocarbònica de Catalunya” website. For each Provençal site, we intersected the GIS database of Regional Service of Archaeology Provence-Alpes-Cote-d’Azur (PATRI-ARCHE) with the archaeological reports, to retrieve the geographical coordinates. It is important to note that the reliability of these coordinates and therefore of the assigned topographic positions is limited due to the fact that these data were recorded using different techniques (reading of topographic maps, use of GPS, etc.), and may include errors and falsified coordinates. To limit the biases due to these geographic coordinates, we have generated a circle of 500 meters in diameter around the habitats, using a basic GIS procedure. These restrictions have led us to use simple percentages and Ford Battleship diagrams, which should be interpreted very cautiously. We are aware of the distortion problems with this diagram: for instance, the third Late

<sup>5</sup> Caraglio, A. 2010: *Entre Provence et Catalogne : approche comparative des dynamiques d’implantation des habitats à la fin du IIIe millénaire av. n. è.*, Reporte inédito, Aix-Marseille Université, Aix-en-Provence.

<sup>6</sup> This is the most recently established chrono-cultural framework, detailed in the PhD work of J. Cauliez (2009). It has

been checked by new datings and by statistical multivariate analyses and it has been published in 2011 (Cauliez, 2011) with some modifications concerning the phases’ name : phase 1 corresponds to horizon 2, phase 2 to horizon 3 and phase 3 to horizon 4.



Neolithic Phase, consisting of six archaeological dwellings, will obviously be over-represented in comparison with the other phases.

### 2.1.2. Geographical specificities

A similar geography and environment and the obvious sea-mountain opposition pattern made this comparative approach between Catalonia and Provence relevant for our purposes. In fact, these two regions are mainly made up of intertwined and similar reliefs (Deffontaines, 1960): old coastal massifs (Esterel, Maures for Provence and Tibidabo, Montnegre for Catalonia), young and high orogeny (Provence backs onto the Alps and Catalonia onto the Pyrenees), and low proportions of continental plains and narrow strips of plain along the Mediterranean Sea. In both regions, these distorted landscapes present problems for the hydrographical systems, even if both regions are crossed and limited by a huge river (the Rhône in Provence and the Ebro in Catalonia). However, whereas the Rhône is clearly a true communication axis to the northern part of France, in spite of its length the Ebro badly serves the surrounding areas.

On the one hand, Catalonia is globally articulated according to several relief units: the Pyrenean area, the Central Depression and finally the Mediterranean System. The Pyrenees is undoubtedly one of the most important relief units in Catalonia, where the Axial Pyrenees concentrate the highest altitude (around 3000 m) and the pre-Pyrenees constitute a more accessible parallel chain which decreases until the Central Depression. The Central Depression is stuck between the Pre-Pyrenees and the Mediterranean System with a staggered succession of plateaus (between 800 and 1000 m). In the Mediterranean system, pre-coastal Cordillera, pre-coastal Depression, coastal Cordillera and coastal Plain follow one another in parallel strips, from the Central Depression to the seaside.

On the other hand, Provence also presents a great variety of reliefs, climates and substrates, divided into five units: the Southern Alps, Upper and Lower Provence, coastal plains and crystalline Provence. The Southern Alps peak at over 4100 m with its high mountain ranges in the north and then go down eastwards to the Mediterranean Sea. Upper and Lower Provence constitute a structured and fragmented central zone by a succession of tablelands and dry mountains, between 1000 and 2000 m. The coastal Plains border the Mediterranean and the Rhone and receive in the south the Crystalline Provence, area of old massifs, volcanic or compartmentalized, with acid and eroded soils.

Taking into account the similarity of both regions, the same methodology can be used in Provence and in Catalonia and a topographic typography has been employed to describe the location of the establish-

ments. An elementary Geographic Information System procedure on ArcGis 10 was implemented to create this topographic typography. The paper focuses only on this variable. We have considered that the "site location" corresponded to a circle of 500 meters in diameter around the habitat. Through geographic coordinates, Digital Elevation Models and the creation of buffer of 500 meters in diameter, we collect geographic data about the location area of each sites: we crossed the digital data of the transversal mean curvature and the longitudinal mean curvature of the slopes, to generate the topographic typography. For a better understanding, we convert these digital data to qualitative data, to get five different terms (Fig. 5): clear prominence, valley, minor prominence, hillside and plain.

## 2.2. Results

### 2.2.1. Catalonia

Firstly, we can note that on 39 Catalan sites, 50 % are located below the altitude of 280 m and the 50 % remaining, above this altitude.

Secondly, the results for Catalonia show a slight evolution in the settlement dynamics trends between the Late Neolithic and the Early Bronze Age (Fig. 6A). Indeed, the Late Neolithic seems to be characterised mostly by locations in valleys (43 %), then in plains (26 %) and on hillsides (22 %). The sites with Bell Beaker are found for the most part in plains (50 %). The Early Bronze age establishments are mainly located in plains (46 %) and to a lesser extent on hillsides (23 %) and in valleys (15 %). If it is difficult to assess the importance of Bell Beaker settlement relocation, given that there were only fourteen sites, in comparison with the Late Neolithic context, a substantial change seems to emerge at the end of third millennium BCE.

Finally, we can see that the choice of clear prominences and of hillsides is stable all along the observed period (Fig. 6B), the choice of valleys is strongest during the Late Neolithic and the choice of plains prevails during the end of third millennium BCE. Minor prominences seem to be specific of sites with Bell Beaker.

However, these comments must be treated with caution as this may result from our data patterning and from the lack of information for some periods.

### 2.2.2. Provence

Firstly, we can note that on 103 Provencal sites, 50 % are located below the altitude of 228 m and the 50 % remaining, above this altitude.

Secondly, at first glance, the results for Provence seem to present a great homogeneity in topographic choices between Late Neolithic sites, sites with Bell Beaker and Early Bronze Age sites (Fig. 7A y B). Nevertheless, the choice of location in plains is globally higher during the Late Neolithic phase in Provence

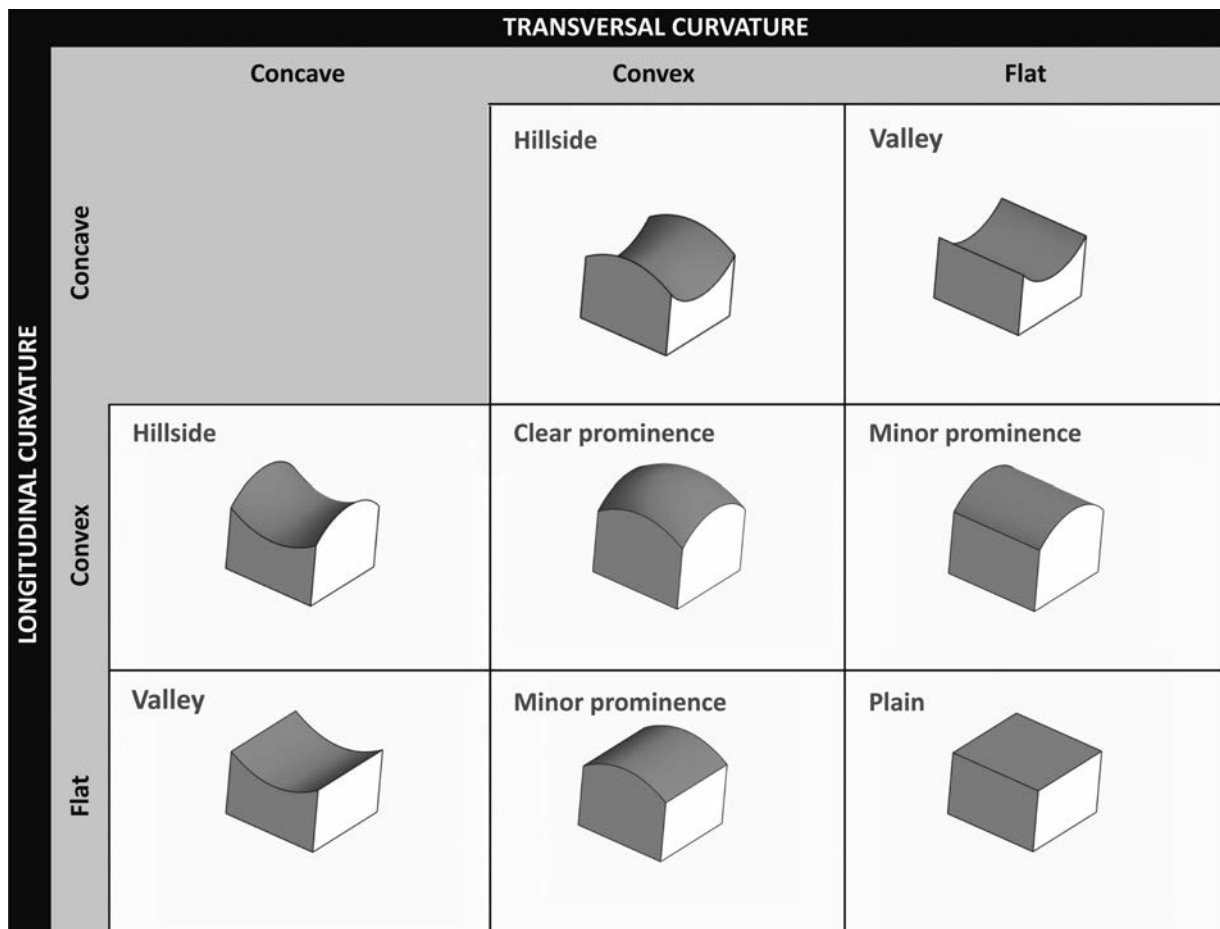


Fig. 5. Topographic typology used in the study (transversal and longitudinal curvature crossed).

(34 %). But if we look further, the results show obviously a much more complex panorama (Fig. 8). Indeed, during the first Late Neolithic phase, preferred locations correspond to minor prominences (36 %) and plains (36 %) (Fig. 8A). This trend seems to continue during the second Late Neolithic phase with respectively 31 % and 28 %, but the clear prominences become significant (24%). The third Late Neolithic Phase settlements appear to be located mostly in plains (50 %) but this result is biased by the meagre quantity of dwellings dated to this phase (six sites). The topographic distribution of Early Bronze Age settlements seems to be more homogeneous, with a slight predominance of clear and minor prominences and of plains (22 % for each location type); the remaining sites are located in valleys and on hillsides (16 % for each location type). Moreover, on the second graphic version (Fig. 8C), minor prominences positions appear to be globally characteristic of the first Late Neolithic Phase (36 %) and the plains positions, specific to all Late Neolithic Phases and Early Bronze Age; the clear prominences positions are not negligible during the second Late Neolithic Phase (24 %) and the Early Bronze Age (22 %).

Finally, as regards the Bell Beaker case, the situation appears to be slightly different (Fig. 8B). Dwellings with

Bell Beaker International styles, supposedly contemporaneous with the second Late Neolithic Phase, appear to be mostly situated on clear prominences (38 %), and to a lesser extent, on minor prominences (17 %) and plains (17 %). Bell Beaker Rhodano-Provençal style settlements are mainly found in valleys (24 %) and plains (24 %), then in minor prominence (19 %) and hillsides (19 %). A topographic distribution quite similar to the Early Bronze Age can be attributed to the dwellings with Barbed Wire Bell Beaker type ware: minor prominences are predominant (31 %) and then clear prominences (21 %). Here again, even if the second graphic version (Fig. 8D) shows that all topographic positions are used for sites with Bell Beaker, some of them are more characteristic of one Bell Beaker style than others. The clear prominences are clearly specific to the Bell Beaker International styles and the minor prominences to Bell Beaker Barbed ware style. Valleys, hillsides and plains are slightly in majority for the Bell Beaker Rhodano-Provençal style.

The main result is that the emergence of Bell Beaker during the second Late Neolithic Phase does not seem to have any significant effect on Late Neolithic settlement pattern dynamics. In fact, we can

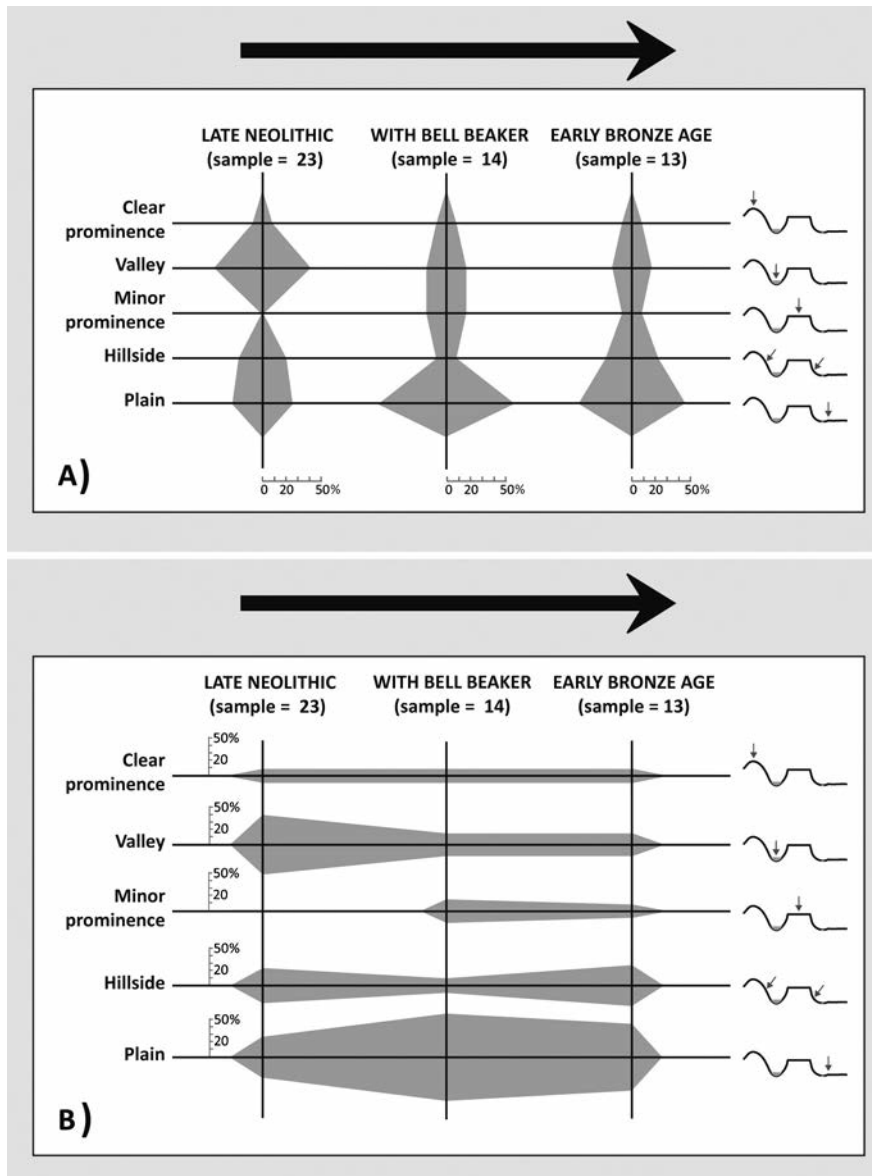


Fig. 6. Topographic choices for the third millennium BCE in Catalonia.

see that topographic traditions of the first Late Neolithic Phase persist with locations on minor prominences and plains. As only six dwellings belong to the third Late Neolithic phase, it is impossible to detect the real impact of Bell Beaker presence on it. However, we observe a sensitive change in Bell Beaker Rhodano-Provençal style with a transition from the clear prominences to the valleys and plains. Last but not least is the observation that, in spite of a dominance of minor prominences in favour of sites with Barbed Wire Bell Beaker ware, the transition to the Early Bronze Age shows a more balanced occupation of all topographic locations. In this way, according to the available data, we cannot weigh the

real impact of Bell Beaker presence on non Bell-Beaker settlements.

### 2.3. Comparisons

Globally, despite common ecological features and some similar geographical settings in both regions, it is difficult to carry out a reliable comparison for the spread of the Bell Beakers in Catalonia and Provence, from a topographic point of view.

If we compare topographic results for Late Neolithic between Catalonia and Provence, using a Fisher's exact test<sup>7</sup> (p-value = 0,003 < 0,05), we can say that there is a statistically significant relation

<sup>7</sup> The "Fisher's exact test" corresponds to the "Chi-square test" but it adjusts to small effectives (equal to 5 individuals or under).

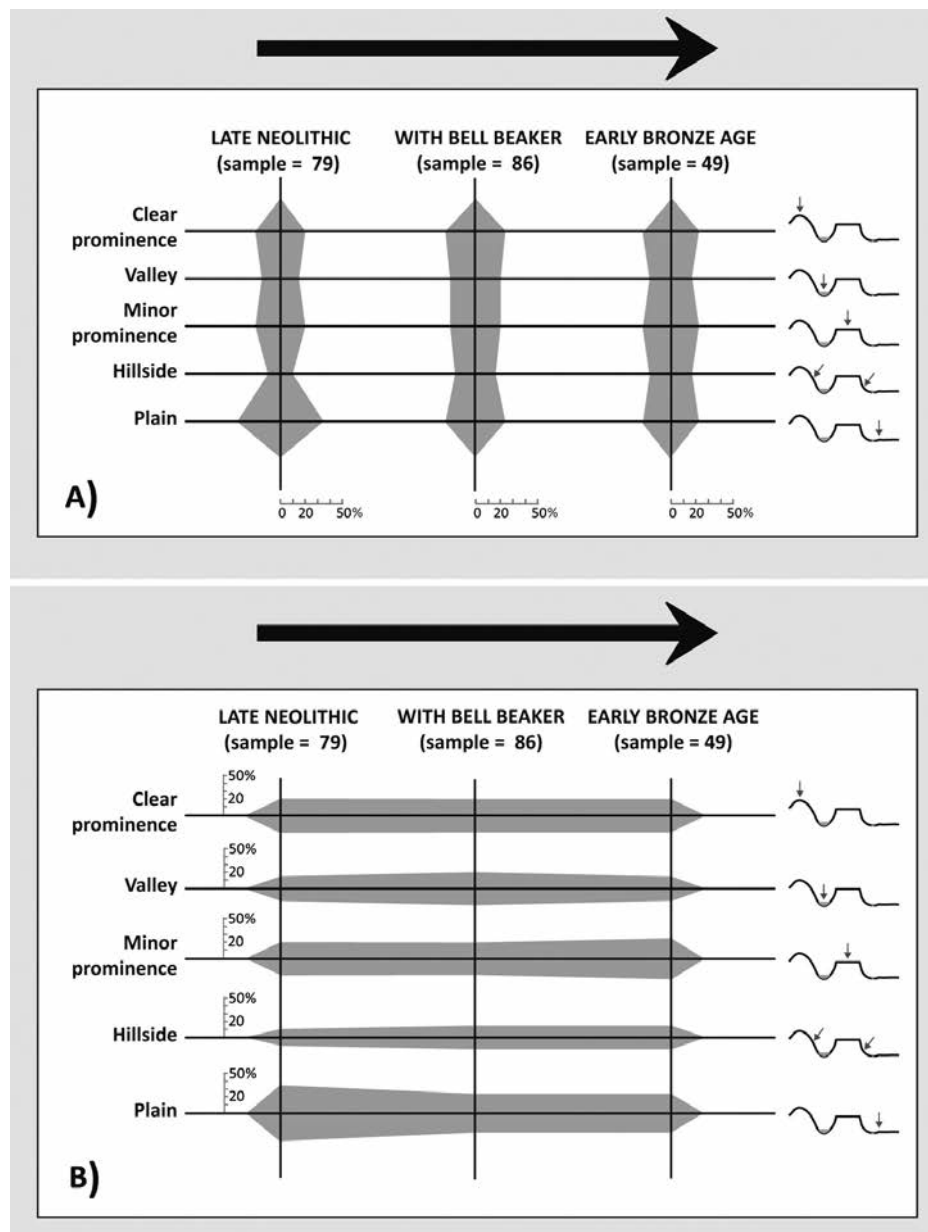


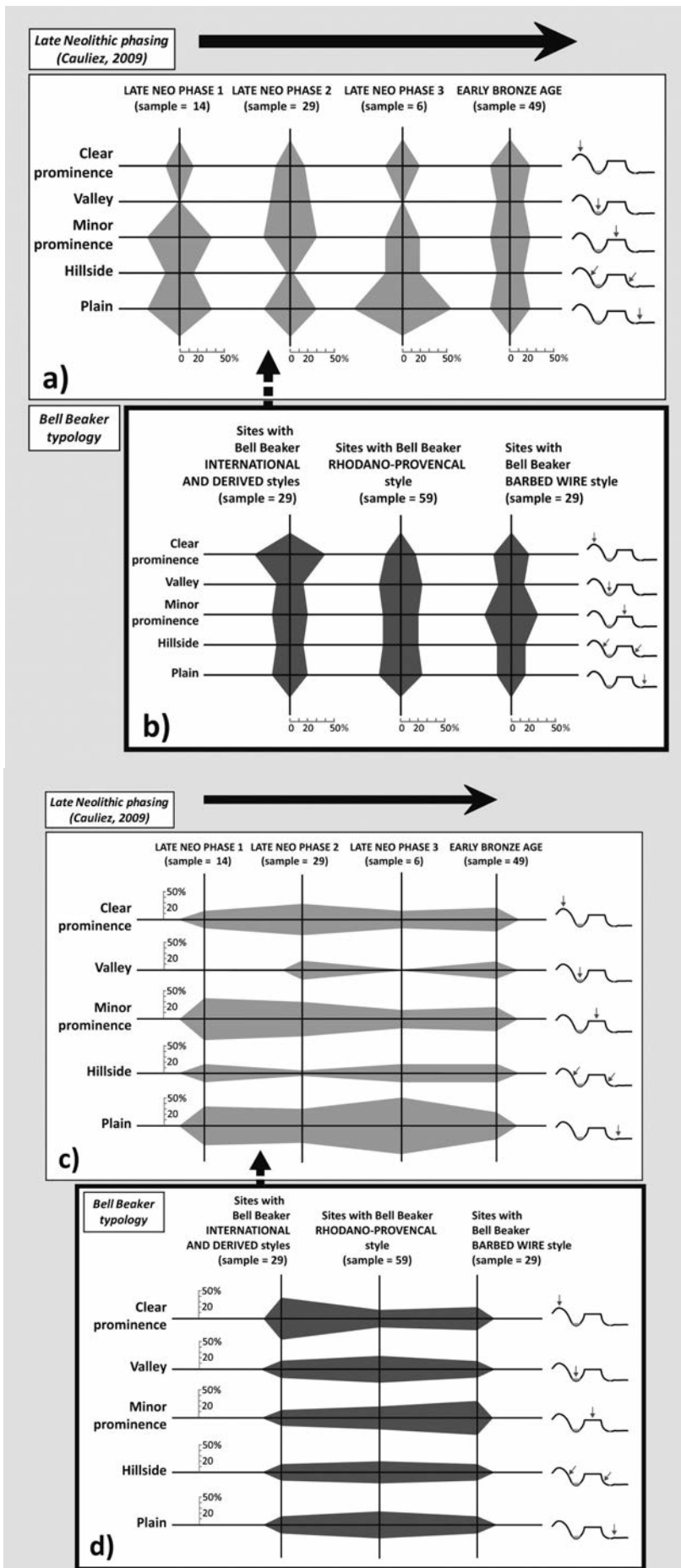
Fig. 7. Topographic choices for the third millennium BCE in Provence.

between the geography of sites (Catalan or Provençal) and their topographic position. So, we can argue that Late Neolithic Catalan sites tend to be settled in valleys, hillsides and plains, whereas Late Neolithic Provençal sites tend to be located in plains and on minor and clear prominences.

But now, if we compare topographic results for sites with Bell Beaker, between Catalonia and Provence, using a Fisher's exact test ( $p\text{-value} = 0,38 > 0,05$ ), we can say that there is not a statistic significant relation between the geography of sites (Catalan or Provençal) and their topographic position. So, we cannot interpret the difference in topographic choices between Catalan and Provençal sites with Bell Beaker. It seems to be the same for Early Bronze Age sites (Fisher's exact test with  $p\text{-value} = 0,37 > 0,05$ ): it is

impossible to compare the tendencies of Early Bronze Age topographic choices between Catalonia and Provence.

To sum up, topographic choices are significant for the Late Neolithic in Catalonia and Provence, but not for the sites with Bell Beaker and for the Early Bronze, whatever the geographic region. Do these results express dynamics of change (like stress or disequilibrium) during the Late Neolithic–Chalcolithic transition, just before Bell Beaker emergence? Would this be related to a demographic pressure? The population growth used to be evocated by many researchers to explain the changes in settlement pattern and in social hierarchy in the late prehistoric societies. In our study, the non-significant results for the location of sites with Bell Beaker and of Early Bronze Age could show that



*Fig. 8.* More detailed settlement patterns dynamics for the third millennium BCE in Provence.

ours samples are not representative of the demographic intensity of these phenomena and their capacity to take up a large range of ecological niches. But, it could also reveal a more drastic variability in the settlement pattern choices of north-western Mediterranean at the ends of third millennium BCE and some complex intercultural mixes. But could not this cultural and/or demographic variability owed to the natural variability of the regional topographies?

### 3. DISCUSSION

#### 3.1. An indecipherable historical dynamic

This comparative survey highlights the difficulties involved in drawing up a comprehensive and reliable comparison of settlement trends in Catalonia and Provence. As seen above, it has only been possible to shed light on some global trends during the Late Neolithic/Early Bronze Age transition, the main obstacle being the compatibility between Catalan and Provençal chronologies. However, other problems undoubtedly stem from data patterning and the biases due to coordinate and topographic recording errors. It also appears that our study is primarily hindered by the

chronological frameworks used, and we believe that it is still difficult to reason in terms of historical dynamics without a well-founded corpus of stratigraphic evidence and a solid and reliable chrono-typological framework for the Bell Beaker, elements still lacking today. It may be easier and more relevant to work with broader chronological frameworks and to advance several scenarios for Bell Beaker material culture, bearing in mind the four chronological model propositions, such as succession, contemporaneity, simultaneity and extension models already brought to light by archaeological fieldwork (Fig. 9).

Obvious objections may be raised as to the validity of this outlook, but another solution could be to distinguish “Bell Beaker settlements” from “settlements with Bell Beaker”. For this reason, we attempted to divide our Provençal sample into “Bell Beaker sites” and “Sites with Bell Beaker” based on selected variables, i.e., an explicit list of easily identified material culture items in the archaeological record (essential types used in Clarke, 1970, Appendix 3.2): Bell Beaker decorated ware, Bell Beaker common ware, Late Neolithic ware, barbed and tanged arrowhead, long flint blade, nail-

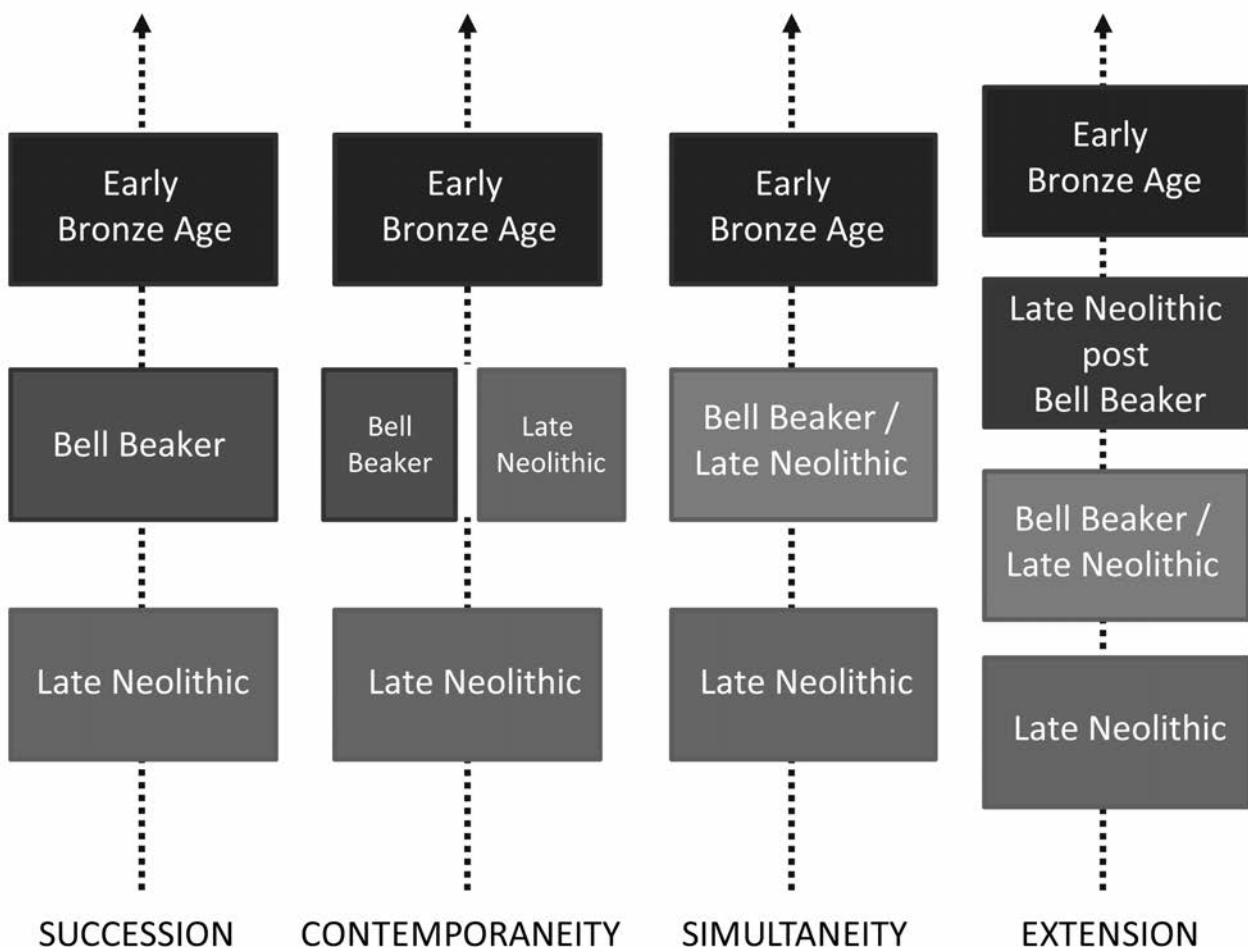


Fig. 9. Four propositions of chronological models.

shaped flint scraper. The Fig. 10 sums up the dichotomy observed in the Bell Beaker domestic assemblages in Provence, between “Bell Beaker sites” and “Sites with Bell Beaker”. Following these criteria, it transpires that only 20% of the Provençal sites can be considered as “Bell Beaker sites” (Fig. 2), exposing the difficulties involved in estimating Bell Beaker impact on local settlement pattern traditions and showing that narrative interpretations are somewhat tenuous.

### 3.2. Dealing with contemporaneity in Provençal domestic contexts: a handful of possibilities

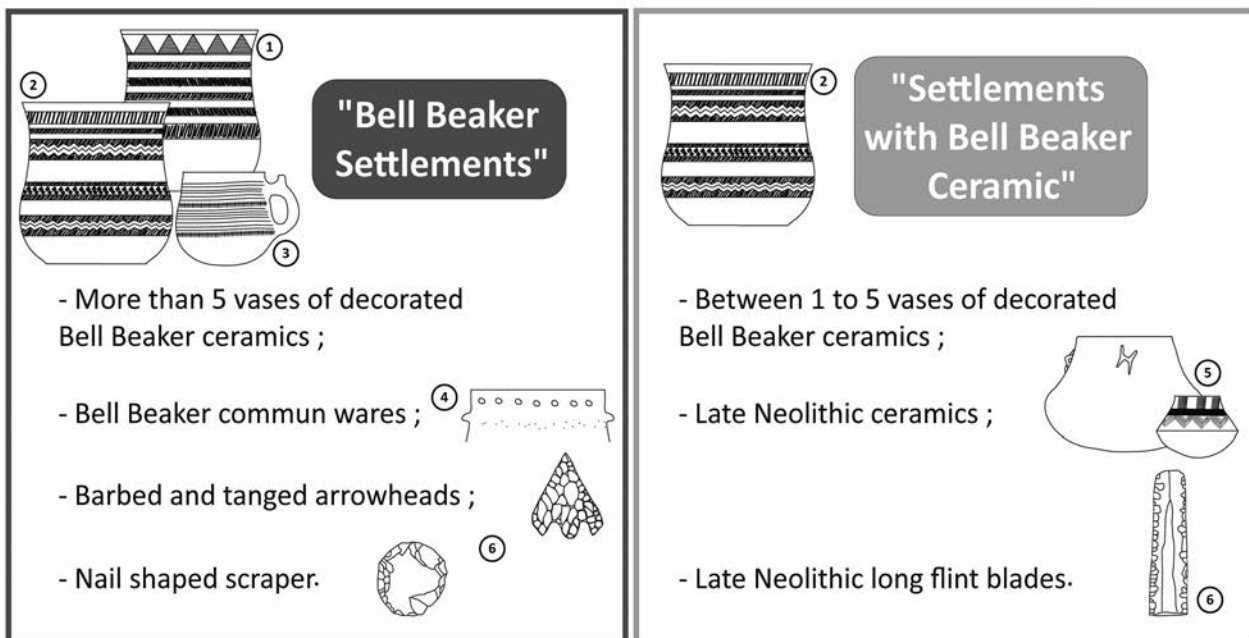
We now know that the theory of succession model (whereby Bell Beaker would be totally posterior to regional cultures) in Mediterranean regions is not true everywhere (Guilaine *et al.*, 2001) and a more accurate scenario is thus required. Material culture items (hybrid artefacts) from mixed traditions have been discovered in southern France (Hayden *et al.*, 2011), such as grog tempered pots of Bell Beaker typology, as grog is not part of Mediterranean pottery traditions from the Earlier Neolithic onwards. Another example is the occurrence of Fontbousse shaped pots bearing Bell Beaker decorations (Convertini *et al.*, 2004). No “ready for use” historical process can be taken for granted. Diversified and accurate scenarios are

required to encompass the whole material record, as D. L. Clarke (1976) did. They must be critically investigated and compared. Our aim here is not to pretend to be exhaustive in terms of possible readings, but to propose an opening to a more nuanced reflection. In the following paragraphs we outline three classical scenarios based on ethnographic observations and archaeological contexts from southwest Europe. Then, we attempt to match the data for the Bell Beaker dwelling sites in the Provence region to each scenario.

#### 3.2.1. Scenario 1: Beaker settlement on a Late Neolithic dwelling (Reoccupation Scenario)

In the Mediterranean area, late Holocene stratigraphic records are often altered by very strong post-depositional processes that remain under-investigated. These geoarchaeological phenomena can erase a succession of archaeological occupations spanning a couple of centuries. They usually provide archaeologists with a thin archaeological layer with several mixed and badly preserved material culture traditions.

Moreover, some archaeological sites in Western and Central Europe provide clear examples of occupations from the Late Neolithic period (prior to the Bell Beaker period) and the Bell Beaker period. The most extensively investigated and published funerary con-



① adapted from Guilaine, 1976 (p. 213, Fig. 1) : evocation of International and derived Bell Beaker styles (Phases 1 and 2) in southern France.  
 ② adapted from Guilaine, 1976 (p. 213, Fig. 1) : evocation of regional Bell Beaker style (Phase 3) in southern France.  
 ③ adapted from Guilaine, 1976 (p. 213, Fig. 1) : evocation of Barbed Wire Bell Beaker style (Phase 4) in southern France.  
 ④ adapted from Besse, 1996 (Fig. 114) : evocation of the n°8 Bell Beaker common ware associated to Phases 2 and 3 from Guilaine (1976).  
 ⑤ adapted from D'Anna, 1999 (p. 150, Fig. 2) : evocation of one of Provençal Late Neolithic ceramics (Rhône-Ouvèze).  
 ⑥ adapted from Furestier, 2004 : evocation of one of Provençal barbed and tanged arrowheads (p. 85, Pl. 3), nail shaped scraper (p. 82, Pl. 1) and Late Neolithic long flint blade (p. 95, Fig. 3).

Fig. 10. Proposition to differentiate “Bell Beaker sites” from “Sites with Bell Beaker” in Provence.

text is still the Petit-Chasseur necropolis in the town centre of Sion (Wallis, Switzerland) (Gallay, 1972 ; Gallay, 1990 ; Gallay, 2006 ; Besse, 2014). In domestic contexts, this diachronic relationship between two material culture sets (Pre-Beaker and Beaker) is provided by the Los Millares (Sante Fe de Mondújar, Almería) fortified site in southern Spain. The largest extension of this settlement belongs to the late fourth millennium BCE while the Bell Beaker phase is restricted to a smaller part of the site (Millán Ramos Millán, 1981 ; Molina González *et al.*, 2004; Ríos Mendoza *et al.*, 2011-2012). In Leceia (Oeiras, Portugal), beyond the enclosing wall, a dwelling unit contains most of the Bell Beaker material culture (Cardoso, 1997-1998 ; Cardoso, 2001). We can add too the case of Valentina de la Concepción (Sevilla, Spain), a huge domestic and funerary site, where the most of Bell Beaker ceramics are recorded in a single structure that appears to have been previously sealed by ritual deposition of human remains (Inácio *et al.*, 2017). This scenario may have been common but is often barely visible in the archaeological record, particularly with early excavations standards.

This first scenario corresponds to establishments where the stratigraphy shows reoccupation above an earlier occupation (Fig. 11, top). In the South of France, several sites reveal a specific Bell Beaker reoccupation after a Late Neolithic phase, such as Le Moulin-Villard (Caissargues, Gard) (Freitas *et al.*, 1988 ; Freitas *et al.*, 1991), Puech Haut (Paulhan, Hérault) (Convertini y Salanova, 2005 ; Carozza, 2009) or Le Mourral (Trèbes, Aude), where abundant Bell Beaker ceramic ware has been found at the top of the filling of the Late Neolithic ditch (Vaquer *et al.*, 2003). The Bell Beaker occupations seem to take advantage of Late Neolithic occupation ruins (Roger, 1988). The represented Bell Beaker styles are the International styles (Le Mourral, Puech Haut) or the Rhodano-Provencal style (Le Moulin Villard, Puech Haut).

### 3.2.2. Scenario 2: two populations share the same region with distinct and separated material cultures and dwelling patterns (Contemporaneity scenario)

This scenario is commonly accentuated by European archaeologists regardless of the theoretical and methodological prerequisites. It means that archaeologists can distinguish two or more different material culture sets within a sufficiently short period of time to infer that they are related to different contemporary social or ethnic groups. It also implies that material culture traditions and social identity overlap. Ethnographic and ethnohistorical illustrations can be provided but, in most cases, the reification of identity in material culture practices is reduced or irrelevant. Ceramic ethnoarchaeology for instance, clearly shows

the complexity of the relationships between ceramic production and use and the multidimensional nature of cultural identity.

Despite the complexity involved, this scenario has been advocated by archaeologists in several cases in Western Europe: Cerny vs Rössen, Chasséen vs Michelsberg, etc. for the 5th and 4th millennia BCE. One of the most convincing cases is the opposition between the lake dwelling cultures and Alpine culture in Western Switzerland. Dozens of lake dwellings spread over the Plateau make up the Auvernier-Cordé culture and show few or no connections with the nearby archaeological culture named Néolithique Final Valaisan in Wallis (Bailly, 2013). This rather strict opposition is often interpreted as an ethnic boundary whose dynamics rely on the spread of the Corded Ware and Bell Beaker cultures.

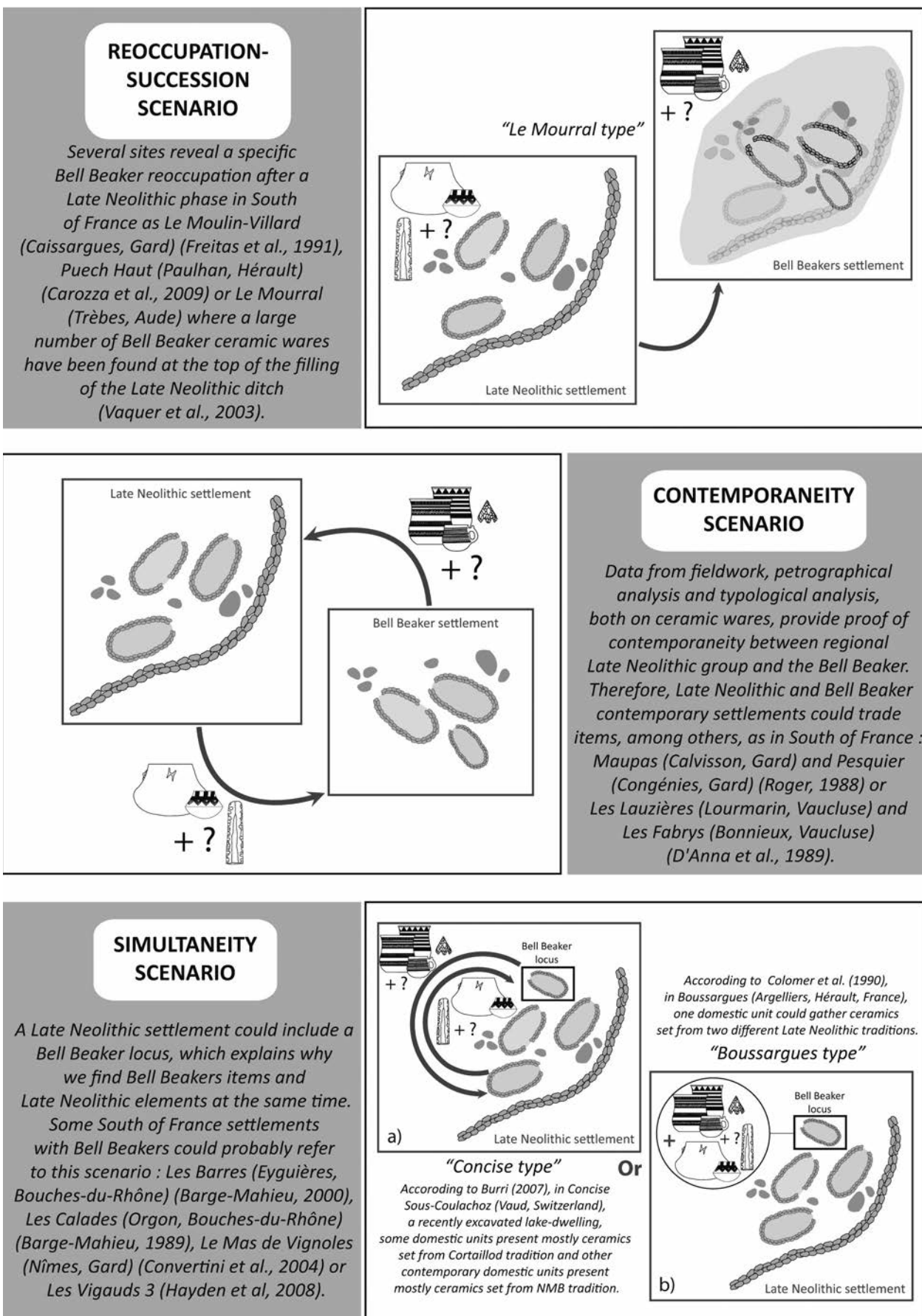
The second scenario corresponds to the classical situation where sites of two different and contemporary traditions exchange goods (Fig. 11, middle). Data from fieldwork, along with petrographic and typological analyses of ceramic wares, provide proof of contemporaneity between regional Late Neolithic and Bell Beaker groups. Therefore, Late Neolithic and Bell Beaker contemporary settlements could trade items and ideas, like at sites in the South of France, such as Maupas (Calvisson, Gard) (Roger *et al.*, 1986; Roger, 1988), Le Bois Sacré (Saint-Côme-et-Maruéjols, Gard) (Roudil *et al.*, 1974) and Largellier (Calvisson, Gard) (Roger, 1988). In Maupas and Le Bois Sacré, Bell Beaker ceramics are dominant (mostly Rhodano-Provencal style), but some regional Late Neolithic ceramics are also present (Fontbouisse style), while in Largellier, near the Fontbouisse site, only Bell Beaker ware has been found (all styles).

### 3.2.3. Scenario 3: populations with different material culture sharing the same living space (Simultaneity scenario)

The third scenario is less common and less clear in archaeological sites but no less interesting. The following examples show that a site with specific traditions can include a domestic unit of another tradition or a domestic unit embodying the two different traditions (Fig. 11, bottom) and have been interpreted as shared living space for different contemporaneous social groups.

On the one hand, this cohabitation situation can be observed, in other south-western European Neolithic contexts, such as in Concise Sous-Coulachoz (Vaud, Switzerland) (Burri, 2007) and Boussargues (Argelliers, Hérault, France) (Colomer *et al.*, 1990). In Concise, a recently excavated lake dwelling, the dendro-dated waterlogged wood offers a very interesting pattern of spatial organization in one of the dwelling phases from the 4th millennium BCE. The timber





**Fig. 11.** Three scenarios hypotheses (with coexistence possibilities) to understand the presence of Bell Beaker elements in Late third millennium BCE settlements in Mediterranean South-Western Europe.

frame buildings are identified by dendrochronology and archaeological analysis. A dichotomy appears between the two parts of the settlement, as far as ceramic ware and herding practices are concerned (Chiquet y Burri, 2013). The interpretation published by the excavators points to a settlement shared by populations from two different cultures: Cortailod from the east and Bourguignon Middle Neolithic from the west. While this interpretation has been challenged elsewhere, the same scenario occurs in an ethnographic case study in western Africa and it cannot be ruled out. For our intents and purposes, such dwellings would provide very complex and indistinct archaeological records. The dendro-dated lake-dwelling of Chalain, Station 3 layer 8 (Fontenu, Jura, France), around 3200 cal BCE, published 15 years ago, comprised a community from two different archaeological cultures. The accurately described material culture, the architecture and the practices provided extensive details of technological choices related to two different traditions (pottery making, tool shape, etc.). It also demonstrated that the architecture used by people from both traditions was shared and could be archaeologically perceived as neutral (Pétrequin, 1997).

This unusual scenario is one potential interpretation for the spatial material culture patterning (mostly decorated ware) in the dry-stone dwelling of Boussargues, around 2600-2400 cal BCE in southern France. This site is part of the Later Neolithic culture of Fontbousse with one domestic unit (Cabane 1) containing ceramics sets from two different Late Neolithic traditions.

On the other hand, G. De Ceuninck (1994) provided an insightful ethnographic example, in the Inner Niger Delta (Mali). The inhabitants of the Kakagnan Peul concession used to buy Somono concession vases so that Kakagnan houses could gather more Somono pots than Peul pots.

Therefore, we can envisage that a Late Neolithic settlement could include a Bell Beaker locus, which would explain why, without a good stratigraphy, we can find Bell Beaker items and Late Neolithic elements at the same time. In La Balma del Serrat del Pont (Tortellà, Girona, Catalonia), a metallurgical activity shelter with outdoor fireplaces and pieces of oven-vases with regional Bell Beaker features (Pyrenean style) have been discovered mixed with regional Late Neolithic ceramics (Vérazien style) and Bell Beaker International styles sherds (Alcalde Gurt *et al.*, 1997 ; Alcalde Gurt *et al.*, 1998). Some settlements with Bell Beakers in the South of France probably represent this scenario, such as Le Mas de Vignole IV (Nîmes, Gard) (Convertini *et al.*, 2004) or Les Vigauds 3 (Langlade, Gard) (Hayden *et al.*, 2011). In Le Mas de Vignole IV, a vase with Bell Beaker (Rhodano-Provençal style) and regional Late Neolithic (Fontbousse style) elements was found in a rapidly filled dumping ground

bearing many domestic artefacts of both traditions (the Bell Beaker Rhodano-Provençal style is dominant but not exclusive). Finally, Les Vignauds 3, a neighbouring site with traditional Fontbousse dry stone houses, reveals a technological combination of Bell Beaker International or Rhodano-Provençal styles features and typical Fontbousse clay inclusions.

These three scenarios do not encompass every potential situation. Nevertheless, they are sufficient to challenge common interpretations of the spread of the Bell Beaker in our field of inquiry. And the existence of these three scenarios in different parts of southeast France during the third millennium BCE is irrefutable. Due to the lack of reliable stratigraphic information, we cannot distribute our Provençal corpus among the different scenarios.

However, we can tentatively link some sites to each scenario. It is likely that the establishments of Ponteau (Martigues, Bouches-du-Rhône) (Margarit *et al.*, 2007; Margarit *et al.*, 2012) and Le Collet Redon (Martigues, Bouches-du-Rhône) (Durrenmath *et al.*, 2010 Escalon de Fonton, 1968) illustrate the first scenario (Reoccupation-Succession scenario). At both sites, Bell Beaker sherds (Rhodano-Provençal and Barbed Ware styles) were found above Late Neolithic occupations. The second scenario (Contemporaneity scenario) would be represented by Les Lauzières (Lourmarin, Vaucluse) and Les Fabrys (Bonnieux, Vaucluse) (D'Anna *et al.*, 1989). These sites are about 8 km apart and contain Late Neolithic Phase 1 (Cauliez, 2009) and Bell Beaker Rhodano-Provençal style vases (Lemerrier, 2004) and could thus be contemporaneous and work together. Lastly, to the third scenario we could assign the sites of Les Calades (Orgon, Bouches-du-Rhône) (Barge, 1989), Les Barres (Eyguières, Bouches-du-Rhône) (Barge, 2000), La Balance-Rue Ferruce (Avignon, Vaucluse) or Place du Palais (Avignon, Vaucluse) (Courtin 1974). Les Calades and Les Barres show respectively two and three dry stone domestic units (Barge, 2009) and the Bell Beaker remains seem to be located in a concentrated area (respectively with Maritime style or with International and Rhodano-Provençal styles). In La Balance-Rue Ferruce and Place du Palais, the Bell Beaker International styles ceramics are blended with Late Neolithic Phase 2 vases (Cauliez, 2009) in the same stratigraphic layer.

#### 4. CONCLUSION

Here, we would like to sum up several key ideas:

- Given the current chronological frameworks in the two studied regions, it is difficult to identify specific dynamics regarding the topographic location of sites with Bell Beaker ceramic ware. We can merely point to changing trends in settlement choices for the Late Neolithic/Early Bronze Age

transition. This paper underlines the lack of reliable chrono-typological frameworks for comparisons of the Bell Beaker phenomenon on a broader European scale. In the Mediterranean areas of Bell Beaker extension, the lack of reliable classification frameworks is not conducive to any historical discourse about the spread of Bell Beakers. Therefore, for the time being, to lead a comparative study in the different Mediterranean regions, we should merge all the sites from this period into three main entities: the Late Neolithic; dwellings with Bell Beakers; the Early Bronze Age.

- We emphasize the paradoxical lack of any Bell Beaker architecture model, a frequently overlooked aspect of Bell Beaker presence. To our knowledge, the changes in settlement pattern dynamics at the end of the third millennium BCE would be less marked in the Mediterranean regions than in central European regions (Hungary, south Germany and western Switzerland). Nevertheless, a fine appraisal of such dynamics is still essential for further analysis. Some other indispensable variables exist in our GIS database for Provence and some multivariate statistical analyses have been conducted on several data such as altitude, degree of slope, relief variation, topography and slope orientation, in our PhD work (Caraglio, 2016a; Caraglio, 2016b). Otherwise, the trends of settlement choices during the Late Neolithic in Catalonia and in Provence can be considered as significative, whereas the trends of sites with Bell Beaker and Early Bronze Age artefacts are less significative.
- Three diversified but classical scenarios have been proposed to critically investigate the whole Bell Beaker material record. They are not exhaustive in terms of possible readings, but they propose an opening to a more nuanced reflection on Bell Beaker settlement pattern.

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