Background to Beakers

Inquiries into regional cultural backgrounds of the Bell Beaker complex

edited by
Harry Fokkens & Franco Nicolis

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Sidestone Press

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Preface

In September 2010 the yearly conference of the European Association of Archaeologists (EAA) was held in the Hague. It was highly praised for its high standard of contributions, but at the same time criticized for its much to small lecture rooms. With the session that we organised on 'the transition to Beakers', we experienced both the high quality and the much to small rooms, but the over all feeling was that we brought together a group of people that spoke the same language and gave very interesting contributions.

The aim of the session was not to search for the origins of Bell Beakers, or for typological similarities, but in stead to discuss the many different ways in which Bell Beakers were incorporated in regional sequences. Our expectation was that these different cultural backgrounds, especially in settlement contexts, and the different ways in which the Bell Beaker 'idea' was regionally interpreted or translated, could tell us more about its character than we know from looking at grave goods alone.

During the conference we heard papers by Harry Fokkens, Franco Nicolis, Janusz Czebreszuk and Marzena Szmyt, Volker Heyd, Alistair Barclay, Olivier Lemercier, a Swiss group of researchers (Jocelyne Desideri, Martine Piguet, Robin Furestier, Florence Cattin and Marie Besse), Robert van de Noort, Jan Turek, Christopher Prescott, a group of researchers from the University of Bristol (Lucija Soberl; Joshua Pollard and Richard Evershed) and finally Katarzyna Mikolajczak and Radoslaw Szczodrowski. When we asked them to work out their contributions in a paper for a book, all contributors reacted enthusiastically, though not all them could indeed participate.

The result is presented here: eight chapters about different backgrounds to Beakers. What has struck me in re-reading those contributions, is how similar the trajectory of introduction is in different regions. One generally sees a period of introduction in Late Neolithic cultural traditions. The adopt the innovation, but in general do not change as a result of that. But around 2500-2400 cal BC in most regions a rapid transformation takes place of existing traditions into something that almost everywhere is called Bell Beaker Culture. However, its outcome and subsequent trajectory is very much different in all regions. The Bell Beaker idea – that is how most contributors indicate it – appears to have reshaped existing traditions, but people adapted the idea to *fit* their own traditions. In most regions there is also a final stage, when the original motives of Bell Beaker decoration live on, but became 'warped', like a story

that has been transmitted from mouth to mouth but changed meaning end message in the process. It is astonishing to see how the use of barbed wire stamps in Beaker motives from south-eastern France to Poland, the Netherlands and Great Britain forms the conclusion of the Bell Beaker phenomenon.

All contributors in one way or another described these process in comparable terms. What is interesting, is that though the description of the process is similar in most regions, the interpretation of the process is very much different everywhere. Most authors emphasise regional interpretations of the original idea, however. These many dimensions of and solutions to the same problem were most inspiring to us, I hope they also inspire the readers.

Finally I would like to thank the organisers of the conference in the Hague to allow our session to be held. I also want to thank Carolien Fokke for her work on the texts as a copy-editor.

Harry Fokkens
April 2012

Chapter 1

Background to Dutch Beakers

A critical review of the Dutch model

Harry Fokkens

Abstract

For the last 35 years the Dutch Model has dominated the discussions about origin of the Bell Beaker. Since there appeared to have been a continuous development of Single Grave Beakers into Bell Beakers, and since settlements with Bell Beakers were present in the Netherlands, the Rhine-Meuse delta is seen as one of the regions where the Bell Beaker developed. In this paper the Dutch model is critically analysed against the background of older regional traditions of the Vlaardingen Culture and the Single Grave Culture. Especially settlement contexts are brought forward as important areas of new research. The settlement data do in fact not support the Dutch Model, and it is argumented that the ^{14}C-evidence for the model is absent as well. One of the conclusions is that in order to understand the Beaker phenomenon better, we should stop focussing on typology and burial data. In stead I propose a programme of looking into the regional backgrounds in which Beakers were first adopted, and in the way this transformed those regional traditions.

Keywords

Dutch Model, settlement studies, diffusion of innovations, Bell Beaker Culture

Introduction

In 1955 Van der Waals and Glasbergen discussed the typological relationship between Protuding Foot Beakers and Bell Beakers in the Netherlands. Two decennia later Lanting and Van der Waals (1976)

re-presented that model and set it in an absolute time frame. They had carried out an extensive ^{14}C-dating programme that confirmed the earlier typology and anchored it in time. Since its chronological basis was beyond dispute, the implications became an irrefutable truth: in the Netherlands there was a continuous development from Single Grave Culture Beakers to Bell Beakers.

In a period that everyone was discussing the origins of Bell Beakers in terms of migrations, this was a revolutionary discovery. The unbroken typological development in the Netherlands contrasted with most other regions where Bell Beakers could be demonstrated to be new 'intrusive' elements that 'replaced' older cultural manifestations. Until 1976 there were several regions that were indicated as the 'homeland'. Moravia and Spain were good candidates because they had supposedly early representatives of Bell Beakers. But the Lanting and Van der Waals rendering of data from the Lower Rhine Basin changed this. Since there was clear typological continuity in the Netherlands, the Lower Rhine basin became one of the origins of the Bell Beaker. In a recent article Lanting (2008) has reconfirmed the ^{14}C basis for the model and, explicitly sees the Lower Rhine Basin / NW Germany as the region where AOO Beakers developed in Single Grave Context and where Bell Beakers originated (Lanting 2008, 35). In the Netherlands no one so far has contested its validity (cf. Drenth and Hogestijn 2006; Van der Beek and Fokkens 2001). Outside the Netherlands, however, doubt is rising (e.g. Salanova 2000, 157 ff.), but still not outspoken.

So, what is the problem if everyone more or less agrees on the validity of the model? There are at least two, in my opinion. In the first place one might question the validity of pottery typology as a main instrument for discussing cultural identity. Pottery typology is in circles of Beaker scholars often the main basis for all discussion. No-one seems to care about the fact that the Dutch Model basically is a typological sequence from the 1950's, when pottery decoration was still unquestioned equalised with cultural identity and when similarities in decoration were also unquestioned linked to physical contact and cultural influence. Beaker scholars compare form and decoration of beakers with form and decoration of Beakers all over Europe and argue on the basis of those comparisons for contact and even migration. One might question the epistemological validity of typology as a tool in that sense.

In the second place the representativity of the data as presented by Lanting and other authors is a subject of discussion. Is it methodologically sound to use predominantly burial data for a discussion of culture change? Back in the nineteen sixties there was not much else. But gradually more and more settlement data are available (cf.

Chapters 5 and 6 of this volume). But since most Beaker scholars are focussed on typology and dating, these settlement contexts are of little interest. They seldomly produce clear sequences and datable stratigraphies that can support the typological series.

While this is all very much accepted in Beaker studies, one wonders why there is seldom discussion about the culture processes that could be responsible for the distribution of decoration patterns. Similarity means contact, but how? Did potters travel around and copy decoration of pots elsewhere? Did the husbands of potters travel around and tell their wives what to do? Did they travel around and bring pots back to be copied? If yes, for what reason? Why would people start making beakers anyway, and at the same time adopt also other objects and burial practices associated with them? Those questions are rarely asked. Neil Brodie (1997; 2001) is one of the few scholars who tried to make a coherent model for process of diffusion. But, though I respect many of his arguments, his model hardly explains the pace and the scale of the spread of Beakers between 2600 and 2400 cal BC.

The kind of additional evidence that Brodie's approach would need probably can not be found in burials, but would have to come from settlements. And that is part of the problem: in most regions Beaker settlements are very much underrepresented in the data and are therefore hardly used in Beaker studies. Yet especially in settlement context it is interesting to see how Beakers relate to older cultural backgrounds. That might give interesting information on how the process of adoption of Beakers developed. This is why the present study has been given the name 'Background to Beakers'. We wanted the authors to discuss the regional contexts in which Beakers occur, rather then finding out what is the oldest Beaker is or where its origins might be located.

In this respect the Dutch data may have much more to offer than people realise, even if much of the data that I will use in this article has already been published. Erik Drenth *et al.* (2006) for instance summarised most of the settlement data from the north-western Netherlands in English, and there are several other settlement publications in Dutch. In the Netherlands we know a relatively large number of Late Neolithic settlements. Everyone knows about the Single Grave Culture sites, but maybe less well known is that AOO pottery was also introduced in the context of Vlaardingen Culture settlements. Vlaardingen 2b, a late phase of the Vlaardingen culture, is even defined by the occurrence of AOO Beakers and Late Single Grave Beakers (Louwe Kooijmans 1976). However, typologically speaking there is no continuity between Vlaardingen pottery and Bell Beakers, none whatsoever (fig. 1).

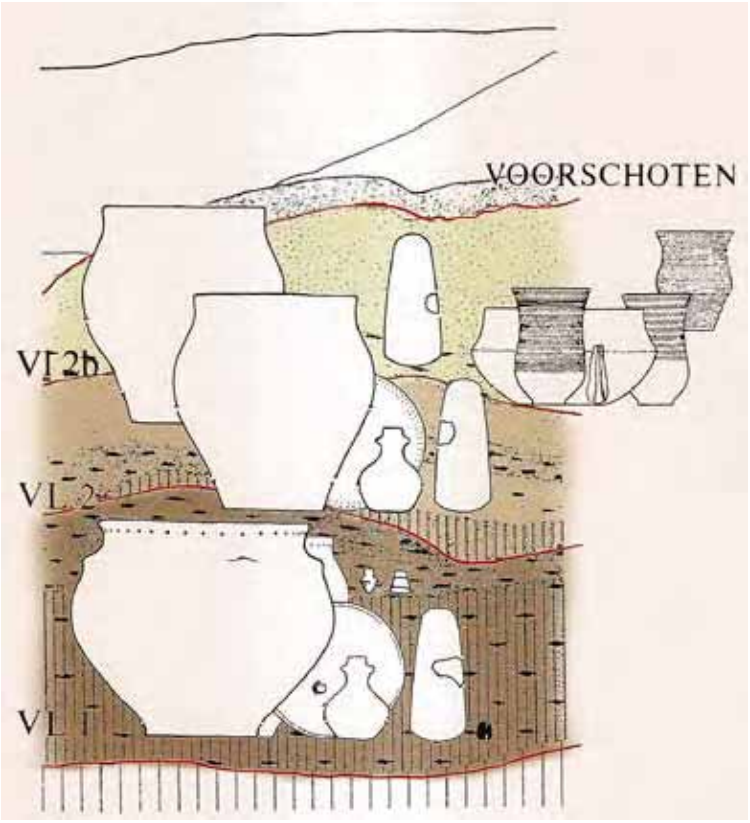

Figure 1. Pottery of the Vlaardingen Culture. The stratigraphic sequence presented is derived from the excavation at Voorschoten-Boschgeest (after Verhart 2010, 124).

This implies that regions where the Vlaardingen culture is present, in the western and southern Netherlands, witnessed a different trajectory of transition to Bell Beakers than the central, northern and eastern Netherlands where the Single Grave Culture dominated. In fact the west and the south show the same kind of 'abrupt' transition from regional Late Neolithic traditions to Beaker complexes as elsewhere in Europe.

This complicates the traditional Dutch Model. Such disconnected sequences are used elsewhere to suggest cultural discontinuity and migration, often with the Low Countries as the land of origin. So, should we conclude that the Dutch model only works well for the central Netherlands? That is indeed what Lanting and Van der Waals emphasised themselves (1976; Lanting 2008). But how then do we interpret the Vlaardingen-AOO transition? Does the distribution of AOO pottery far outside the traditional Single Grave Culture 'territory' signify migration from the central Netherlands? Lanting

indeed suggests this (2008, 31), though he adds that also diffusion could be at work. So do we have to narrow the origin of the Beakers down to the central Netherlands only? Why? How? What was so special about that region? Lanting has a simple explanation (2008, 16, my translation): 'a group within the SGC society apparently wanted to distinguish themselves by the use of a divergent type of pottery and by divergent grave orientations'. But I'm afraid I'm not entirely convinced by this statement. 'Leapin' lizards, mr. Science!', as Kent Flannery would have said (cf. Flannery 1973, 51).

These considerations determine the focus of this paper. I would like to discuss problems with the classical typology first. I will make clear that there are problems with terminology, with the resolution of dating, and with the premises of the traditional model. Second I will introduce the cultural landscape of the Late Neolithic in the Low Countries in more detail in order to get a better understanding of the backgrounds to the Beaker development. Finally the consequences of these issues for present models on the introduction of Bell Beakers are discussed.

The physical and the cultural landscape

Maybe this is the right moment to introduce the geology of the Netherlands, because this may help understanding the cultural landscape of the Late Neolithic. The Low Countries can be best understood – with respect to geological formation influencing late prehistoric occupation – as the result of two important formation phases: the Pleistocene on the one hand and the Holocene on the other. In the Pleistocene, especially during the Saalien glaciation, land ice reached the Netherlands and formed the ice pushed ridges of the Veluwe, the Eastern Netherlands, Nijmegen and the north and northwest (province of Drenthe). West of Nijmegen and south of the ice pushed ridges of the central Netherlands, The Rhine and the Meuse formed a large river delta flowing in western direction (the present North Sea basin). In the Weichselien late glacial period, westerly winds covered much of the Saalien boulder clay landscape by wind blown sands (cover sands) and loess (in the south). This 'Pleistocene' sand landscape tilts in western and northern direction towards the North Sea Basin. Especially that part of the sand landscape that lays underneath 0 m NAP (Nieuw Amsterdams Peil = Dutch datum) was remodelled in the Holocene period under influence of sea level fluctuations. During the Holocene five mayor ecological zones existed that had different characteristics and different qualities for habitation. This resulted in the formation of different regional cultural formations. The different eco-zones are (Fig. 2):

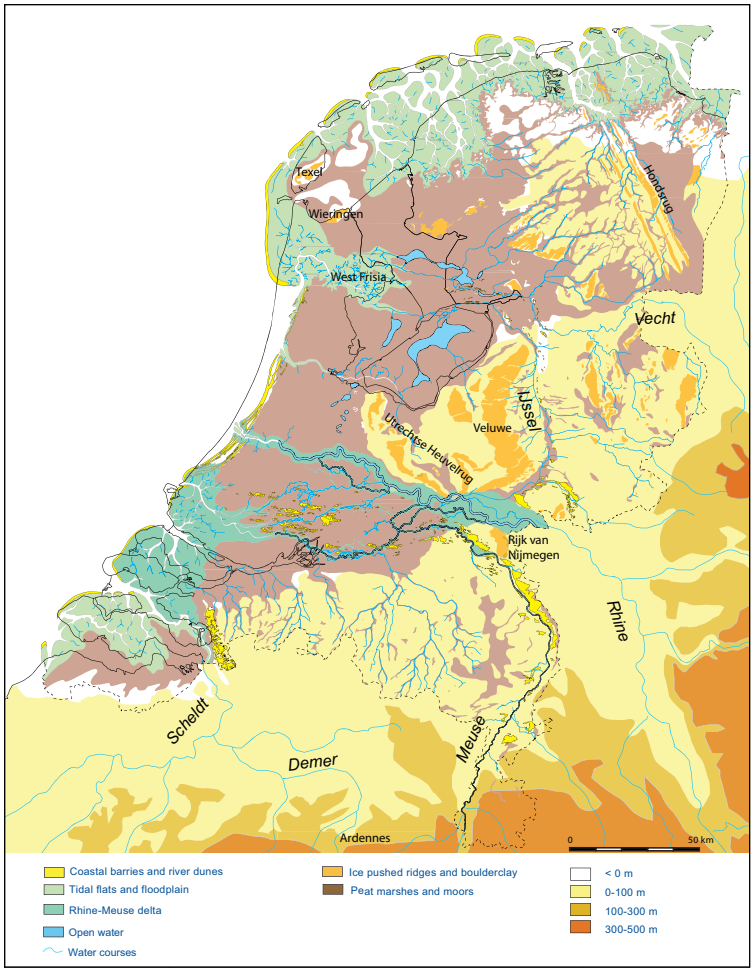

Figure 2. Palaeogeographical reconstruction of the Netherlands c. 2750 cal BC. After Vos and Weerts 2011.

- *The coastal lowlands*. These were marked by myriads of gullies and tidal marshes; tidal influence may have been felt far inland. On the coast side these were protected from the sea by wind-blown dunes, but the coastline was broken until it started to close between 3500 and 2500 cal BC (Vos and Weerts 2011, 50). Large river systems like the Scheldt, the Meuse, the Rhine and the IJssel-Vecht kept their own outlets in the coast. Contact between the uplands and the coast was possible through these rivers and adjacent tidal zones.
- *The peat marshes*. East of the coastal zone there were peat marshes. During the Holocene these became more and more substantial as drainage systems were impeded by coastal barrier forma-

tion (Vos and Weerts 2011, 54). In principle these zones were not inhabited. They may have been used for hunting and fishing, they may even have been of considerable importance in cosmological sense, but we have little evidence for habitation in or on top of the peat until the Early Iron Age.

- *The Rhine-Meuse delta*. The delta was a mix of eco-zones. The river delta was broad and a miriad of river gullies, crevasse splays and marshy back swamps. Everywhere in the Rhine-Meuse delta Pleistocene outcrops (Dutch: *donken*) which had formed as river dunes during the Weichselien, and also natural levees, dried-up crevasse splays and silted-up river channels provided good places for living. They were suitable for small scale farming as well as gathering, hunting and fishing.
- *The 'Pleistocene' uplands of the central, eastern and northern Netherlands.* The uplands consisted of cover sands and locally of ice pushed ridges, especially in the central Netherlands (the Utrechtse Heuvelrug, de Veluwe), the Eastern Netherlands, the Northern Netherlands (de Hondsrug). The coversand plateaus were probably forested and suitable for farming, but also for hunting and gathering.
- *The southern 'Pleistocene' uplands and plateaus.* Between the Rhine-Meuse delta and the Ardennes massive, the cover sand plateaus of Brabant do not show the marked relief changes of the regions that have been transformed by land ice. The plateaus are drained by many small rivers and rivulets originating in the Ardennes, and in peat moors that once covered this region. The sandy soils probably were covered in forest and may have been less attractive for the extended mixed farming economies of the Early and Middle Neolithic. Apart from a wide distribution of stone axes, the first settlement evidence dates to the Late Neolithic, especially in the direct vicinity of the Rhine-Meuse basin and the Meuse valley.

Against this physical background the cultural landscape formed. Specific cultural traditions developed in the different landscape zones and seem to have kept these traditions over thousands of years. We might be speaking about people of the lowlands and people of the uplands, though I realise that this probably a too simple dichotomy, and a more nuanced sketch is possible. But I will use this distinction here for the reason of argument.

The lowlands traditionally were the 'habitat' of the Neolithic Hazendonk/Swifterbant and the later Vlaardingen communities. We know much of their settlements and their mixed farming-hunting-fishing economies, but very little about their burial practices. The 'Pleistocene' uplands of the central, eastern and northern

Netherlands were the 'habitat' of 'full' farming communities of the Funnel Beaker Culture and later the Single Grave Culture. From the southern Pleistocene uplands we actually have very little evidence, but it is quite clear that both the FBC and the early SGC culture communities did not cross the Rhine-Meuse delta, except for the Nijmegen region where there are still ice-pushed ridges.

A discussion of the Dutch Model

Understanding the physical landscape is in my view important to understand the cultural landscape. From this exposé it may have become clear that the Lower-Rhine Basin proper was in fact not the place of origin of Bell Beakers, because the delta was the traditional habitat of the Vlaardingen culture. Interestingly Lanting and Van der Waals emphasised already that their model is in particular valid for the central Netherlands north of the Rhine, the Veluwe region. This was confirmed again by recent research (Lanting 2008, 12). That most scholars have taken the Veluwe region as a *pars pro toto* for the entire Lower-Rhine Basin, is therefore not their fault. The epistemological problem that this poses, is that a clearly regional sequence is taken to represent supra-regional developments. This is an assumption that most typologists, also Lanting, constantly make. I make this point early in the discussion in order to emphasise that much what now follows involves this problem. I will discuss this in more detail later on.

What binds the Single Grave or Corded Ware pottery (in the Netherlands originally indicated as Protuding Foot Beakers) to Bell Beakers is the cord impression. Cord impressions are an important element on Single Grave pottery, on All Over Ornamented (All over Corded) and on early Bell Beakers (Fig. 3). Of Single Grave pottery only the upper half is decorated, of Bell Beaker pottery the entire body is decorated but with undecorated zones. All Over Ornamented Beakers combine elements of both traditions. This is especially true for Lanting's type 2IIa, which has the same combination of decorative elements as the maritime Bell Beaker (2Ia): comb impressions bordered by cord impressions. Lanting is absolutely certain therefore that 2Ia developed from 2IIa, though there is very little to substantiate this assumption in absolute chronological terms. That they are contemporary is certain, but which was the chicken and which the egg is not. In my opinion that question is unsolvable, but also of very little interest. For those interested in the detailed discussions I refer to the work of Drenth and Hogestijn (2006) and Lanting (most recent 2008).

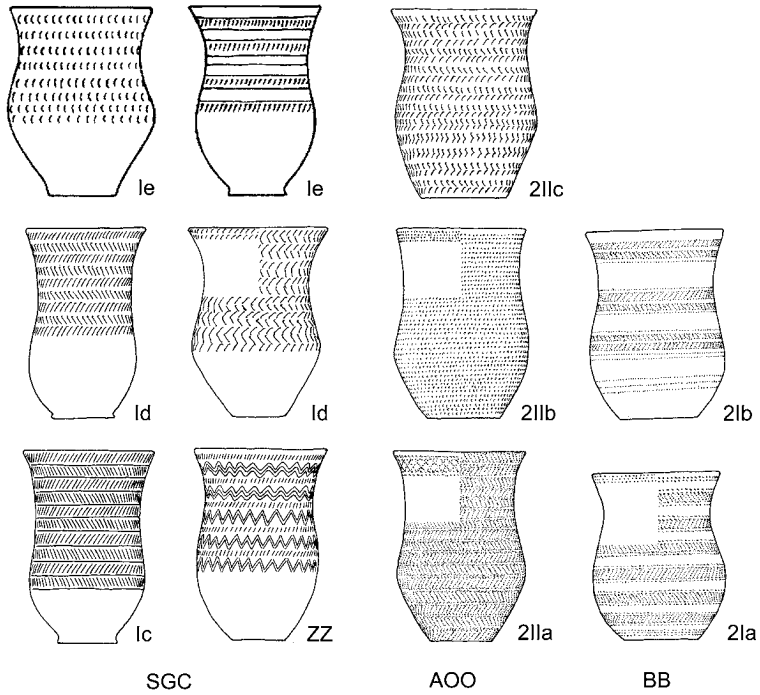

Figure 3. Late Single Grave, All Over Ornamented and Early Bell Beakers from the Netherlands.

One of the key elements in the typological discussion is the position of the 'pan-European' or 'maritime' Beaker (type 2Ia in the Dutch sequence) and the position of AOO/AOC pottery as a go between Bell Beaker Culture and Single Grave Culture. The first point to make is that following Lanting (2008) the Bell Beaker sequence in the Netherlands starts with the maritime Beaker (type 2Ia). Confusing for scholars outside the Netherlands, this implies that AOO/AOC Beakers are *not* considered to belong to the Bell Beaker Culture. Drenth and Hogestijn consider them late Single Grave Beakers (e.g. 2006). Lanting prefers to give AOO Beakers a separate place between both groups (Lanting 2008, 16), like also Van der Waals and Glasbergen (1955) did. They indicated AOO pottery as 'hybrid' beakers because they combine decorative elements of both the SGC and the BB group.

For Lanting it is absolute certain (2008, 35) that the maritime Beaker developed *out of* the 2IIa AOO Beaker because both have zones of 'comb' impressions bordered by cord impressions. Lanting sees a maximum overlap of 50 years between the two types, because in his view 2IIa possibly exists until 2450 cal BC, while 2Ia possibly begins c. 2500 cal BC (2008, 38). The factual evidence for this

dating is extremely thin, however. When the three useful dates for type 2Ia (cf. Lanting and van der Plicht 2001, 82) are calibrated, a range between 2500 and 2300 cal BC emerges. This implies that there is ample overlap between late SGC Beakers, the AOO type, and Early Bell Beakers (2600-2400 cal BC; Fig. 3) (Lanting and Van der Plicht 2001, 81). In other words, we seem to have reached the limits of the usefulness of ^{14}C-dating in solving the question of Bell Beaker origins.

Strange enough Jan Lanting completely ignores in his 2008 analysis of Dutch AOO and Early Bell Beakers Furholt's discussion of the Corded Ware in Europe. This omission is curious, because Furholt critically discusses the use of ^{14}C-dates for the support of typological sequences, in particular with respect to the Netherlands (Furholt 2003, 91-100). Furholt's analysis is furthermore confirmed by Włodarczak (2009). In Furholt's view the resolution of the Dutch dates is not good enough to support Lanting's claims for development of the maritime Beaker out of the 2IIa Beaker in the Netherlands (Furholt 2003, 98). Furthermore he states that the claims for development of AOO and Bell Beaker out of SGC beakers can not ne supported by the ^{14}C-dates, neither can it be refuted on that basis: 'Das "Dutch model", d.h. die zeitliche Sequenz der Gruppen PFB, AOO und GB kann von den C^{14}-Daten nicht bestätigt werden.' (Furholt 2003, 100).

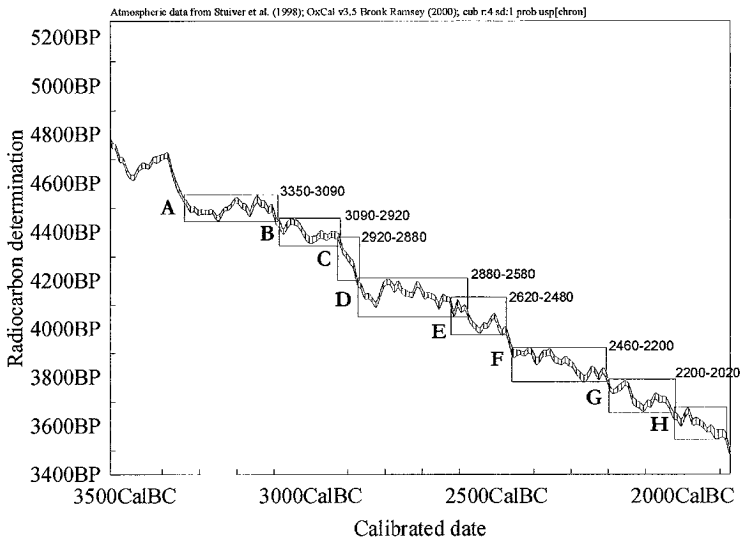

Figure 4. The wiggle ranges as they are distinguished by Furholt 2003. From Furholt 2003, fig. 1.

The problem is partly due to the sample quality of the Dutch data, but more importantly to the large wiggle plateaus in the Corded Ware and Beaker periods. Furholt therefore divides the third millennium in a number of wiggle ranges in which dating has to be grouped (Fig. 4). The critical transition period in which AOO and Maritime Beakers appears are Furholt's wiggle ranges D and E. Within these ranges ^{14}C-dating gives no resolution, it is rather a matter of classification: a date classifies either in the D or E, and occasionally in the F range. Lanting is probably aware of these problems, but apparently has decided that Furholt's analysis does not contribute to his own, like he also rather bluntly dismisses Needham's analysis (2005). Instead Lanting supplements the lack of precise data with a considerable amount of typological juggling. But this is not at all without danger! Though typology can help where ^{14}C-dating fails, Beaker typology is tricky because decoration of Beakers involved a culture process of translating European wide signals in regional contexts. But in typological studies, culture processes behind the adoption of Beaker forms and decorations are generally ignored. They implicitly seem to suggest that Bronze Age potters held biannual conventions to decide what types to follow and how to synchronise type development over large regions. It would be interesting from an epistemological point of view to challenge the hidden assumptions of Beaker typology further, but I will not pursue that issue further in this paper.

Background to Beakers

While much of the above discussion is focussed on burial data, the settlement data are often ignored because chronologically they are of less value in typological debates. However, settlements contexts do provide an additional insight in the cultural context in which Bell Beaker pottery is introduced. Unlike my Dutch colleagues, I take the position here that AOO pottery marks the beginning of major culture change, and in fact the beginning of what is called the Bell Beaker culture, thus ignoring typological arguments. There is no doubd that AOO beakers are frequently associated with SGC beakers (especially types 1d and 1e), both in burials and in settlements. However, this association presents itself not only in the context of Single Grave Culture settlements, but also in late Vlaardingen Culture settlements. AOO pottery therefore is not associated with only SGC culture sites. And here we have a typological problem, because Vlaardngen Culture pottery does not at all have any typological relationship to SGC/AOO-pottery. So how do we explain the

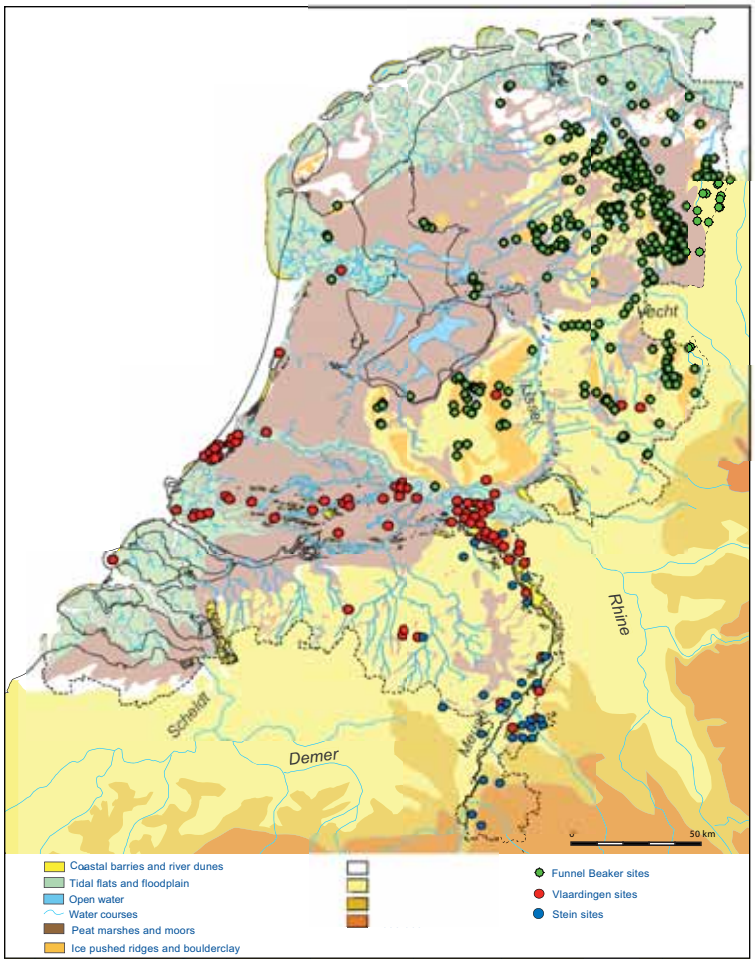

Figure 5. The cultural landscape of the Netherlands c. 3400-2850 cal BC. The dots represent all types of finds, ranging from megalithic monuments to stray finds. The distribution of FBC sites has been provided by K. Wentink on the basis of ARCHIS data, the distribution of the Vlaardingen and Stein sites is based on Verhart and De Ridder 2010b, fig. 3 and 4.

presence of a totally new pottery type those sites? In order to discuss that dilemma properly a bit more background to the Vlaardingen Culture may be needed.

Sites of the Vlaardingen Culture are restricted to the 'lowlands' of the Rhine-Meuse delta, the Meuse valley, the coastal dunes and probably the coastal region in the northwest of the Netherlands (fig. 5). In the Meuse valley and on the higher soils the almost identical Stein pottery is found. The Vlaardingen Culture therefore is taken by Louwe Kooijmans (2005) to include both ceramic traditions, though this is not undisputed (cf. Brinkkemper *et al*. 2010; Van

Gijn and Bakker 2005). Figure 5 shows that the Vlaardingen sites are restricted to the Rhine-Meuse delta, though a few sites are also present in the IJssel-Vecht basin. The IJssel as a branch of the Rhine did not yet exist as a river in this period (Vos and Weerts 2011), but the palaeo-reconstructions show drainage systems from the Veluwe connected the uplands with the coastal areas further away. West Frisia was densely inhabited in the Late Neolithic, maybe because this was a coastal region directly bordering the ice pushed uplands of Wieringen and Texel. But apart from one Vlaardingen site, West Frisia sofar has yielded predominantly Funnel Beaker and Single Grave settlement sites.

Vlaardingen people lived on (river) dunes and on the fringes of the uplands in what we would call wet environments. This implies they lived on the higher soils, also had arable plots in that zone, but exploited the fish and fowl rich lowlands as well. With this settlement pattern and economy they continued the Middle Neolithic Hazendonk tradition (Louwe Kooijmans 2005). The Vlaardingen tradition developed around 3400 cal BC and disappeared around 2500 cal BC (cf. Lanting and Van der Plicht 2001). One of the problems with the Vlaardingen Culture, is that we know several settlement sites, but that these are difficult to date. People probably returned many times to the same spot over periods of almost a millennium, but in the present situation all of these habitation phases are mixed. Therefore the map of Vlaardingen and Stein sites combine some 900 years of habitation. Though several sites now have been excavated, and also several house plans are known (cf. Verhart 2010), most of the dots in Figure 5 represent 'loose' finds and features without clear context. From the distribution it is in any case clear that Vlaardingen communities were bound to the Rhine-Meuse delta and the river valleys in the southern uplands.

When the Vlaardingen culture developed in the west, around 3400 cal BC, the Pleistocene uplands of the central, northern, eastern and north-western Netherlands became occupied by people of the megalithic Funnel Beaker culture. Both traditions, that of the Vlaardingen culture in the Rhine-Meuse valley and the Funnel Beaker Culture in the central, northern and eastern uplands were quite different in settlement choice, in material culture (pottery, flint, axes), and in burial traditions. Vlaardingen Culture people were connected to Atlantic exchange networks with respect to flint procurement, Funnel Beaker Culture sites show links to the Nordic (flint) exchange networks (Beuker 2005). Vlaardingen axes had an oval cross section and were made of southern flint (Bakker 2006), Funnel Beaker Culture axes were square in cross section and made of Nordic flint (Beuker 2005). Moreover, we know many FBC axe

hoards (cf. Wentink 2006) but no Vlaardingen hoards. We know virtually no Funnel Beaker Culture settlements, but many Funnel Beaker collective burials. The situation for the Vlaardingen Culture is the exact opposite: we know many settlements, even house plans of the late phase, but only very few burials. The interpretation of the cultural patterns of both traditions is therefore based on very different types of evidence. To summarise, the Vlaardingen Culture continued a long-standing tradition of farming, hunting, fishing and gathering in a lowland situation, the Funnel Beaker Culture

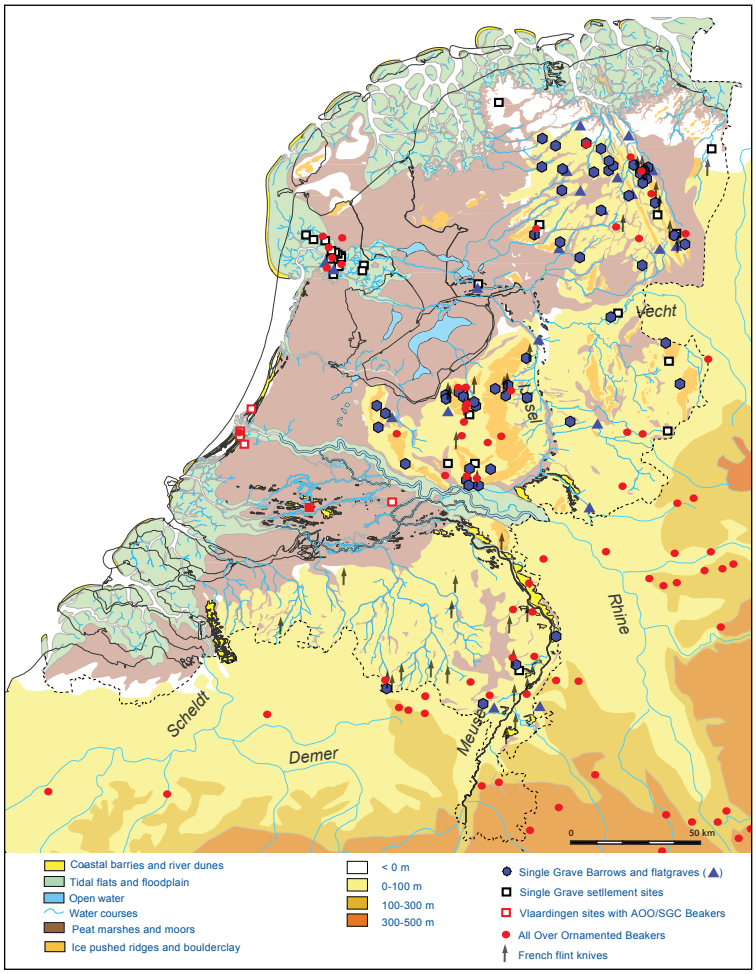

Figure 6. The cultural landscape of the Netherlands c. 2850-2400 cal BC. Presented are Single Grave sites of all periods. AOO Beakers, as well as French flint knives are separately indicated in order to get an impression of the distribution in the transition phase. The distribution of AOO pottery is based on Lanting 2008, fig. 8a. The distribution of SGC settlement sites and barrows is based on Drenth et al. 2008, fig 2, the distribution of French flint knives is provided by K. Wentink (Wentink in prep.).

probably colonised previously uninhabited (but not unused) Pleistocene uplands of the north, east and central Netherlands north of the rivers Rhine and Meuse.

Though the Vlaardingen Culture and the Funnel Beaker Culture were different in many respects, there are also signs of communication and exchange between the people of both cultural traditions. Especially in the regions where the two traditions met we find occasional Funnel Beaker potsherds in Vlaardingen settlement context (Brinkkemper *et al.* 2010). Moreover, both traditions used the same typical objects like collard flasks and perforated clay discs (Van Regteren Altena *et al.* 1962, 218). So between c. 3400 and 2900 cal BC there were two different cultural traditions present in the Netherlands, roughly divided between the Pleistocene uplands of the north, northwest and central Netherlands (Funnel Beaker Culture) and the river dunes, coastal barriers and higher sand soils of the western and southern Netherlands (Vlaardingen Culture) (Fig. 5).

After c. 2900 cal BC the Funnel Beaker Culture was replaced by the Single Grave Culture on the Pleistocene uplands of the Northern, Eastern and Central Netherlands (Fig. 6). Furholt's analysis demonstrates that in the Netherlands the Single Grave Culture started in his wiggle range D, that is after 2880 cal BC (Fig. 4; Furholt 2003, 96). The Single Grave Culture (SGC) is best known through its barrows and grave goods, but in the Low Countries several settlement sites are known. A few can be placed in a early phase of the SGC, but most of the settlement sites date from the late phase, which is characterised (a.o.) by the occurrence of AOO pottery. A number of settlements is found in the province of North-Holland (cf. Drenth *et al.* 2008), all probably dating to the late phase (Furholts wiggle range E (2620-2480) and possibly F (2460-2200)).

While in the uplands the Single Grave Culture developed, in the Lower-Rhine delta 'nothing' happened. The Vlaardingen Culture was not replaced by the Single Grave Culture, though occasional SGC Beakers are found in Vlaardingen context. Until 2500 cal BC site locations, pottery tradition, exchange networks (flint) remained the same as before (cf. Van Gijn and Bakker 2005). In the late phase, however, in these sites also AOO pottery of different sub-types appeared, in combination with late SGC Beakers of type 1d and 1e. This assemblage is found at the Hazendonk (Louwe Kooijmans 1976), but also at for instance the settlement Voorschoten-De Donk, situated on a coastal barrier ridge, so near the original coast (Van Veen 1989; Wasmus 2011). These sites also date to Furholt's wiggle range D (2620-2480). This period therefore can be indicated as the transition phase from the Middle to the Late Neolithic in the Netherlands. This transition period in, in terms of visible material

culture, signified by the emergence of AOO pottery, but also of flint knives made of Grand-Pressigny (GP) and Romigny-Léhry flint from central and northern France (Van Gijn 2010, 19; Fig. 6).

Transition to Bell Beakers

To summarize the background to Beakers: in the uplands the Low Countries AOO Beakers are associated with on the one hand late SGC beakers (settlements and burials) and in the Lower-Rhine delta with Vlaardingen pottery (settlements only). That is not a new discovery, far from that, but this fact is rarely used in the discussion about the Dutch Model and the origins of Bell Beakers. Yet this is important, because it shows that the introduction follows two different trajectories, though both with more or less the same outcome: the emergence of a Bell Beaker 'culture'. One trajectory is already known: that is the Single Grave – Bell Beaker trajectory. This development starts with the introduction of AOO Beakers, but the burial traditions hardly change. AOO Beakers and GP knives are new additions as grave goods. Lanting suggests that the orientation of the dead in the burial changes, but in several occasions it does not (Lanting 2008, 16). In my view the data are too fragmentary to support such a statement.

The other trajectory is the introduction of AOO pottery in Vlaardingen context. Interestingly in the Rhine-Meuse delta no barrows develop, neither do GP knives occur (Fig. 6). Their distribution remains restricted to the uplands. The way I read this, is that the very strong regional traditions that were in place already for several centennia, in first instance resisted the innovations that probably were signified by Beakers and by AOO pottery. Following the work of Rogers, innovation is here defined as 'an idea, practice or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behavior is concerned, whether or not an idea is 'objectively' new. […] The perceived newness of the idea for the individual determines his or her reaction to it. If an idea is new to the individual, it is an innovation' (Rogers 2003, 12).

Important for the rate of adoption, and for the question whether an innovation is adopted or not, is its compatibility with existing traditions (Rogers 2003, 240). I will come back later on what kind of innovation might have been involved, but at this point it is important to observe that when AOO pottery was introduced, existing traditions remained intact, that nothing much seems to have changed, not in SGC context, nor in Vlaardingen context. Rogers predicts this: this is the period in which early innovators adopt the innovation, but without creating mayor change. Mayor change only develops when the critical mass is reached and the rate of adoption

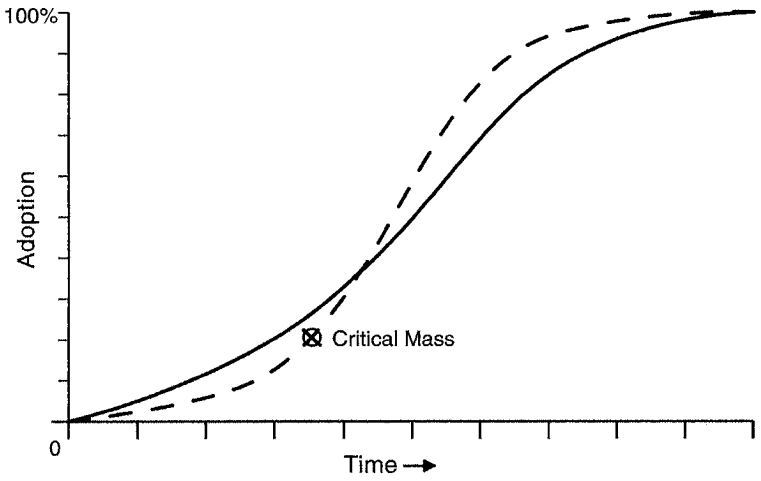

Figure 7. *The concept of critical mass, showing how the rate of adoption changes when critical mass is reached (from Rogers 2003, 344).*

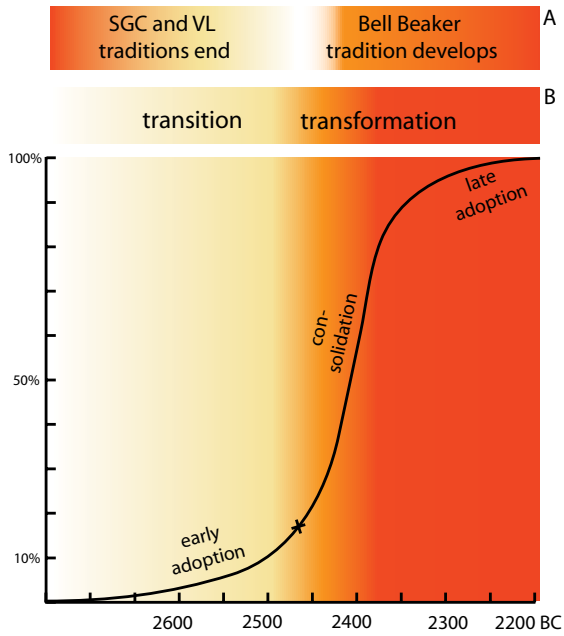

Figure 8. A model of adoption of the innovation(s) with which the Bell Beaker phenomenon is associated. The colour intensity indicates archaeological visibility of related objects and features. A) indicates the visibility of subsequent cultural traditions, B) shows how the introduction trajectory of innovations may have caused differential visibility and the subsequent archaeological perception of abrupt culture change.

changes (Rogers 2003, 343; Fig. 7). This is the point where so many people have already adopted an innovation that non-adopters run the risk not to belong to the 'mainstream' any longer. In an earlier article (Fokkens 2008, 19) I have suggested that this is the phase that innovations become archaeologically visible and that we may 'see' culture change (Fig. 8).

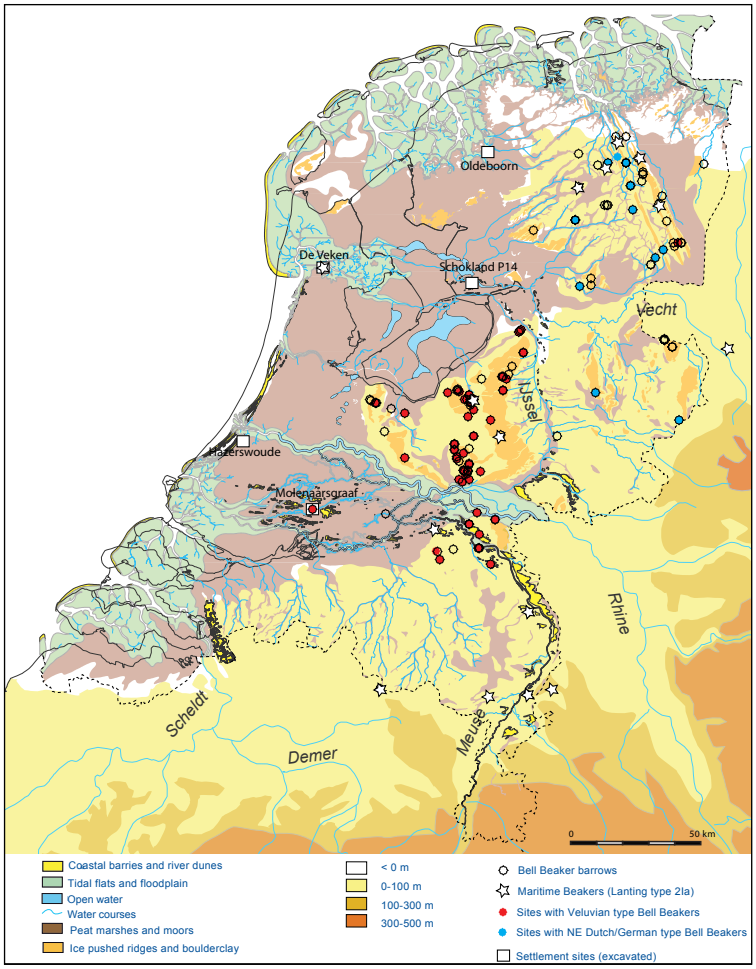

Figure 9. The cultural landscape of the Netherlands c. 2500-2000 cal BC. Presented are all Bell Beaker sites. The distribution if barrows, Veluvian Bell Beakers and NE Dutch/German Beakers is provided by K. Wentink (Wentink in prep.), the distribution of maritime Bell Beaker type 2Ia is based on Lanting 2008, fig. 8b.

In my view this transition phase, the period of adoption before the critical mass is reached, can be recognised in many regions of Europe. This is characterised as *a period in which new elements are incorporated in regional traditions without changing them*. Examples are manifold and in this book several are presented. From that perspective it should not surprise anyone that for instance in Britanny and southeastern France AOO and later Bell Beakers are found in existing collective burial complexes (cf. Lemercier, and Czebreszuk and Smyt, this volume). In Ireland Carlin (2011) recently demonstrated how Bell Beakers are adopted in Grooved Ware contexts, both of settlements and of monuments. The early Beakers in Upper Largie (Sheridan 2008) are another point in case: the type of burial certainly is not continental. Neither are the burials of the Boscombe Bowmen for instance (Fitzpatrick 2011). Even in the northern Netherlands Bell Beaker associated pottery is recorded from an older megalithic monument. If one were to study the appearance of AOO and Bell Beakers consistently from this point of view, one probably would have to conclude that in many regions they were adopted in regional traditions first.

The transition phase appears to have been rather short, only a few generations. After that period both the Vlaardingen and Single Grave traditions disappear, probably in Furholts wiggle range F (2460-2200 cal BC; Fig. 4). This is the phase in which the Bell Beaker culture further develops (Fig. 9). The maritime Beaker is always used as a marker, Lanting even proposes a separate maritime phase (2008), but in fact there are only very few 2Ia Beakers in the Netherlands and ^{14}C-dates are too few and insecure to support that idea (cf. Drenth and Hogestijn 2006; Beckerman in prep). Much better visible, though just as difficult to date, is the development of the Veluvian Bell Beaker. In settlement context these Beakers are associated with potbeakers (cf. Ten Anscher 2011 for detailed discussion of this and related types), but only very few of these contexts have been well excavated and published. Keeping the mechanisms in mind that were just discussed, one might say that when we archaeologically 'see' the regional Veluvian style, this is after the critical mass has been reached (Fig. 8) and after a period of rapid change. We may experience that in terms of archaeological data as a cultural discontinuity. So regionalisation may well have started 2400 cal BC or earlier, but *had* developed around 2300 cal BC.

Concluding remarks

The patterns that have been observed in the previous paragraphs raise a number questions. I will only adress a few points in my final discussion, mainly to suggest routes for further research.

What about the validity of Dutch model?

Lanting, is convinced that the Maritime Bell Beaker is the only and the first true Bell Beaker. On the basis of typological arguments and ^{14} dates he is convinced that type 2Ia develops from AOO type 2IIa and therefore must be younger. For Lanting the consequence is that AOO pottery is not yet Bell Beaker pottery, neither is it Single Grave pottery (2008). Drenth and Hogestijn on the other hand, consistently call AOO pottery late Single Grave Culture pottery since it occurs synchronous with Single Grave Culture Beakers type 1d and 1e.

This discussion is entirely typological, and there is in fact no 'hard' evidence for the classical Dutch Model. Salanova (2000, 157 ff.) analysed the problems with Lanting's position thoroughly and in my view rightly contests the claims to regional development of the maritime style in the Lower-Rhine, even if there are typological 'predecessors' (Salanova 2000, 159; 2004). Her view is repeated by several others, notably Needham (2005, 176 ff.), Fitzpatrick (2011, 232), Furholt (2003), Beckerman (in prep.), while this position was already taken earlier by for instance Case (1993). Like Furholt, Salanova, Needham, Kinnes *et al.* (1991), Włodarczak (2009, 737), Beckerman (in prep.) pointed out the weakness of several the Dutch samples, most of which were taken from charcoal and not always from high quality context.

My conclusion is that the Dutch Model is at least contested. Those who hold on to it, have to *believe* in typology as a valid and encompassing tool for discussing culture change. And even then the typological arguments that are repeated over and over again can not convincingly be supported by ^{14}C-dates. Moreover, we have seen that the sequences are not as clear cut as most people think they are. Personally I do not believe that there is any evidence to suggest that type 2IIa was earlier than 2Ia. Both decorative patterns could have developed following the same kind of European wide 'idea' behind the Beaker. In other words, in my view there is no basis left for claiming that the origins of either the AOO or the Maritime Beaker in the context of the Dutch SGC.

What is the alternative?

Deconstruction of an existing model asks for replacement by a new one. At the moment I can only indicate directions for further research. I have tried to indicate that a better theory for the adoption of innovations is part of the story. But the observed pattern can be read in various ways. What complicates interpretation, is that the transition phase starts with a wider diffusion not of AOO Beakers

alone, but of the combination of AOO and late SGC Beakers. And in this phase much more developments mark a period of change. All settlements in West Frisia, start in this phase, for instance. The first undisputed rectangular house plans can be attributed to this period, both in Vlaardingen and in Single Grave context. Everywhere arable fields are visible in the form of criss-cross *ard* marks, etc.

The resolution of the settlement data is still low, partly because we have not looked in the directions presented here. In the last decennia numerous new sites have been excavated (cf. Verhart and De Ridder 2010a) and new data now become available. These new data give a much more varied impression of the relation between Vlaardingen, Single Grave and Bell Beaker traditions than previously known. As Figure 9 shows, however, Bell Beaker sites are still very scarce in the Rhine-Meuse delta and also in the northwest. It appears that the Late SGC and Vlaardingen sites were not used after the transition period. This does not necessarily imply that habitation disappeared in this period, but it certainly is much more difficult to locate. Moreover, if one would plot all potbeaker sherds, rather than only 'true' Beakers, the image would probably change considerably. Because coherent research is lacking in this field, however, such maps can not yet be made.

Though the archaeological data still needs a lot of analysis from this type of perspective, my suggestion is there is much more to it than 'just' the introduction of AOO pottery and French flint knives. The last are important, because they show that in the entire Netherlands relations with 'Atlantic' exchange networks had developed. Given the possible sources of Bell Beaker copper in Spain and Portugal, that might mean that the stage is being set for the introduction of copper in the early Bell Beaker period, even though the first copper knives are only introduced in Late Bell Beaker context (Veluvian Bell Beakers). Again I point at the process of the adoption of innovations here, which predicts that when copper becomes archaeologically visible, the introduction has probably already started quite some time before. We should not at all be surprised is copper objects were found in Late Vlaardingen or late Single Grave contexts. They may have been present, but only in very small amounts.

Access to other exchange networks, however, does not explain the low visibility of Bell Beaker settlements, however. Van der Beek (2001, 2004) suggested that changing agricultural practices may have played a role as well. Even though there is no concrete evidence yet, this is something that should be explored further in the future.

What kind of innovation(s) are we dealing with?

The truth is that even in the Netherlands, we only have a few examples of 'clean' Bell Beaker settlements (Fig. 9). Of those, Molenaarsgraaf (Louwe Kooijmans 1974) is still one of the best researched, though recently also Schokland P14 was published (Ten Anscher 2011; cf. Fig. 9). The question that we might ask is to what extent we expect a 'clean' Beaker tradition to develop. Maybe that would just be an illusion. What may be visible, are regional interpretations of the Beaker 'idea'. Needham (2005) has called this the *fission horizon* in Britain. We may see this horizon everywhere in different forms. What researchers call 'Bell Beaker Culture' in Switzerland or Poland has only very vague resemblance to what we call Bell Beaker Culture in the Netherlands or in Great Britain. Yes, there are similarities in decorative patterns and form, but there is also very much dissimilarity everywhere. There are similar objects in burials, but in regionally different styles and always in different combinations.

In my view the development of the Bell Beaker phenomenon is related to (a set of) innovations that were acceptable in most communities, but not in all (cf. Vander Linden 2006) burial traditions. Stylistically similar Beakers and were deposited in most burials, while also position of the dead and their orientation became 'standard' in large parts of Europe. Though seldom the whole cultural repertoire of the Beaker set is present, the burial assemblages demonstrate an Europe wide 'understanding' of how a Beaker ancestor should be presented at death. Men were accompanied by artefacts associated with archery and crafts, women with artefacts associated with personal adornment and also with crafts. And then there are the Beakers of course.

This 'standardised' selection of artefacts in Beaker burials, does not represent elites in my view, but they represent consciously constructed identities of 'exemplary' ancestors (Fokkens 2005; 1999). In death men were presented as archers (warriors), sometimes also as smiths, but never as farmers. This indicates that archery, possibly martiality in general (Fitzpatrick 2011), was an important value for Beaker men. But the Beaker itself remains a mystery, or maybe not? Sherratt (1987) has started the discussion on Beakers and alcohol and I think that his view is still valid and needs much more research. Evidence for beer and sweateners is becoming stronger (cf. Vander Linden 2001; Turek chapter 8 of this volume; Wentink in prep.).

So, is alcohol induced martiality part of the 'innovations' that changed the European world between 2600 and 2400? *Bronze Age Booze and Hooligans*, is that what we are researching? Are our soccer matches of to day, and their public, maybe the best ethnographic example for what transformed the Late Neolithic into a Beaker

world? That would explain much: the fact that it was adopted in many different cultural environments, the suggestion that decoration and form, even in vague copies, symbolised being part of the new 'world', of a new identity. It even could explain why people would take entire vessels (with its contents) home to share, show around and to be copied.

Problem solved? Of course not. I have tried to provoke new questions, to stimulate new directions of research. Let's try to focus on differences for a while. Of course it is interesting to see how similar things are, but is it not much more interesting how different they are? Similar but different (Czebreszuk 2004) is still one of the best ways to characterise the Beaker world. We should focus more on the background to Beakers and on the ways in which the Beaker 'idea' was re-contextualised in different regional contexts.

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Chapter 2

No longer north of the beakers

Modeling an interpretative platform for third millennium transformations in Norway

Christopher Prescott

Abstract

The distribution of material culture interpreted as an expression of the Bell Beaker Culture or phenomenon has been extended north and east in recent years. Concurrently, there is a continuing trend to tone down the BBC as a typologically circumscribed cultural phenomenon, and instead view it as the material expression of a movement of fundamental societal change in third millennium Europe. The present study extends the Northern European BBC geography into the Scandinavian Peninsula, potentially as far north as the Arctic Circle. Using the transformation of disparate cultural regions of Norway as the point of departure, this article addresses the classic questions of BBC-research; what happened, how did it happen and why? The nature of the preceding societies, and the in many places marginal environmental settings in terms of agriculture, create a contrastive relief that perhaps illuminates historical processes, not just for Norway, but also more generally for third millennium Europe.

Keywords

Scandinavia, Norway, Bell Beaker, Nordic Late Neolithic

Introduction

The last couple of decades of Bell Beaker Culture (BBC) studies have continued to refine the typological and distributional patterns inherent to the field. Evolving patterns in "established Bell Beaker regions" generated from these studies are important and provide the basis for interpretative studies of social interaction, identities and historical trajectories, but the extension of BB-culture east and north (*e.g.* compare Harrison 1980, 13 and Vander Linden 2007, fig.1) is more important to the context of the present article. Although BB-influences and materials have been recognised in the Scandinavian material for some time (Glob 1945; Lomborg 1979; Malmer 1962; Myhre 1979), the definition of BB-regions in western Scandinavia and the incorporation of this important phenomenom as a driving force in Scandinavian prehistory (Holberg 2000; Melheim 2011; Prescott and Walderhaug 1995; Prieto-Martínez 2008; 2009; Sarauw 2008; Vander Linden 2007; 2011; Vandkilde 2005) has acquired a more coherent historical focus only recently, with geographical focus on Jutland. For those concerned with the north-western margins of Europe, such as Norway, this is especially important. The explicit definition of the BBC-region in Jutland provides a historical factor that helps to explain the transition to the Nordic Late Neolithic and the transformation of Scandinavia. It also challenges the predominant "local evolution" perspective inherent to the last 50 years of Scandinavian archaeology. This is particularly true for the Norwegian case, where it has become increasingly apparent that around 2400–2350 cal BC, the Middle Neolithic B to Late Neolithic 1 transition, there was a dramatic reorientation of material expressions, productive modes, economic organisation and ideology (Prescott 1996; Prescott and Walderhaug 1995).

The Norwegian case: premises

A central debate concerning Norwegian prehistory, echoed in general terms throughout the Scandinavian Peninsula, has been concerned with Neolithisation (Glørstad 2006; Glørstad and Prescott 2009) and the introduction of agricultural modes of production (Prescott 1996). The present article is not the place for a detailed discussion of Early and Middle Neolithic A periods (EN, MNA, 3950/3900–2800/2750 cal BC) and Middle Neolithic B (MNB, 2800/2750–2400/2350 cal BC), but an outline is necessary to clarify the premises for this article. Traditional consensus may be summed up as advocating small-scale, tentative Neolithic agriculture and herding in a Funnel Beaker region in southeast Norway and a region in southwestern Norway. The inland and western coast was,

however, populated by hunter-gatherer groups with a strong marine orientation. Though variably recognising the importance of marine and terrestrial resources in the hunter-gatherer adaptations, there has been a partiality for searching for early traces of agriculture. Despite numerous reports of agro-pastoral practices, the evidence for occurrences of domesticated animals and cereals, not to mention actual production, remains dubious, riddled with inaccurate reports, methodological problems and representativity issues (Prescott 1996). With the MNB (2800–2400 cal BC) there is evidence of Corded Ware/Battle Axe groups and influence (Hinsch 1954). What this period represents in terms of cultures, production and settlement remains unclear (therefore sometimes referred to as a "black box" [Prescott and Walderhaug 1995]),still it seems there were dispersed Corded Ware groups in the east, while a fundamentally hunter-gatherer way of life persisted in most parts of the country. The interpretive drive in both processual and post-processual archaeologies has been local and evolutionary – a gradual development towards agriculture in the Neolithic, with the full-fledged blossoming of the sedentary farm institution in the Bronze or Iron Ages. Thus, despite the strong hunter-gatherer expression in the general material, and the MNB "black box", the preferred narrative was one of gradual, continuous development through the Neolithic – a process that unfolded over more than 2000 years.

The above scenario still has proponents, but an alternative outline has won increasing support, not the least in light of empirical developments (Prescott 2005). Along the southeastern Skagerrak coast (Fig. 1) – from Lista to Østfold - there was in the EN and MNA a heterogeneous region of Funnel Beaker groups, bound together by coastal communication (Glørstad 2009; 2011). The economy here is not understood in detail, and wild maritime and terrestrial resources were probably essential. Otherwise in Norway, production was based on hunting and gathering, and the Neolithic artifacts (like flint axes) that do occur can best be explained by interaction between Funnel Beaker groups and hunter-gatherers. To the extent there might have been any agriculture, it was of marginal significance. Moving to the MNB, there were "islands" of Corded Ware Battle Axe groups around the Oslo fjord and into the eastern interior. There was conceivably (but accurate data are lacking) some degree of traditional Neolithic agricultural production along the Skagerrak coast.

Around the transition from MNB3 to the LN1 (2400/2350 cal BC) the above "Neolithic diversity" is transformed into an unprecedentedly unified cultural expression (the Nordic Late Neolithic/ Dagger Period). A situation best described as diverse regional groups

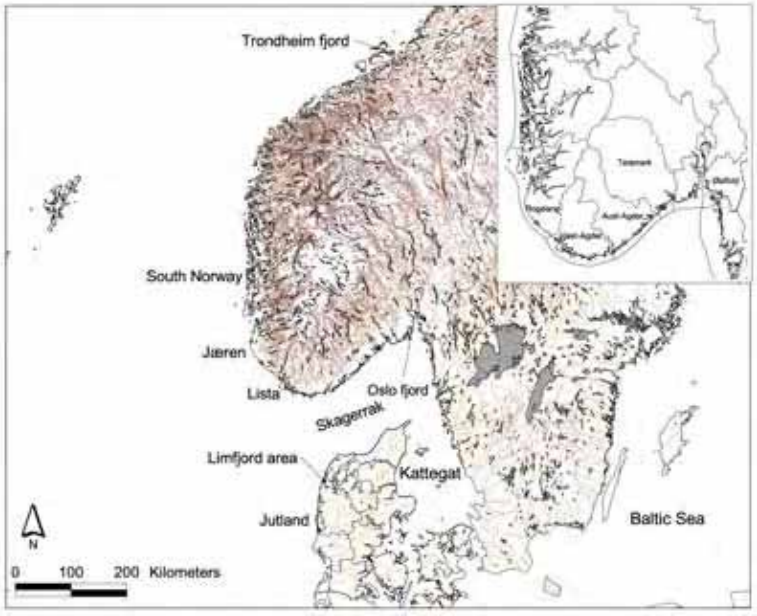

Figure 1. Map of the study area (map by H. Glørstad).

of hunter-gatherers (potentially practicing a little small-scale agriculture) and islands of Battle Axe settlements was replaced by a novel and rapidly established homogeneous cultural and economic package (Prescott and Walderhaug 1995). The data indicate new social dynamics and a new ideology. Important interpretative features (Prescott 2005; 2009) are the farm institution (long houses and fields), an economy based on agro-pastoralism, architecture (dual-aisled, post-supported longhouse), technologies (bifacial lithics and arguably metallurgy [Melheim 2011]), artifact styles (patterned on metal precursors), and objects like flint daggers. Within the Nordic sphere interaction between regions was intensified, probably expanding and intensifying in response to developments in boat technology (Østmo 2008; 2011) and far-flung chains of kinship and alliances (Prescott 2009). On an even larger scale, the continuous patchwork of small-scale groups extending from the Atlantic and into the taiga of Northeastern Europe was conceivably replaced by a cultural border between easterly groups and northwestern groups (Amundsen 2011; also Odner 2000). The initial contours of the ensuing Bronze Age society were now established. Based on radiocarbon dates and other contextual data this happened abruptly around 2400 BC. It took place from the southeastern part of the coast, in the interior, and along the coast, potentially as far North as the Arctic Circle. This transition affected regions readily suited for agro-pastoralism,

but also barren skerries along the coast, narrow fjords, inland valleys and interior highlands.

The above outline forms the premise for this article, and can be summed up as follows:

- The EN and MN were characterised by hunter-gatherer societies, and small-scale Neolithic societies with mixed economies.
- In the ensuing MNB there were conceivably three types of social formations: hunter-gatherers in most of Norway, hunter-gatherer societies with an element of agriculture in parts of SW- and SE Norway, and areas in eastern Norway influenced by or characterised as Corded Ware/Battle Axe Culture.
- Around the transition to the LN, the whole region – independent of the preceding socio-cultural formation – was rapidly transformed to the Nordic Late Neolithic.
- This transformation conceivably happened in the course of a generation and dramatically affected material culture and practices, technology, production, economy, social constitution and spheres of interaction.

Further questions: why or how?

> *What if history is not cyclical and slow moving, but arrhythmic and – at times almost stationary, but also capable of accelerating suddenly like a sports car? What if collapse does not arrive over a number of centuries, but comes suddenly, like a thief in the night?* (Niall Fergusson 2010, 22).

The underlying narrative in most syntheses of Norwegian prehistory is variations over gradual, long-term developments. There is a preference for an evolutionary "Neolithic model", with locally conditioned development of agriculture, albeit influenced by external cultural developments like the Funnel Beaker or Battle Axe Cultures. Such local, evolutionary models have been increasingly challenged (Prescott and Glørstad 2011; Prescott 1996; Walderhaug and Prescott 1995). Today, the "evolutionary approach" mainly attempts to stretch a few radiocarbon dates of potential cultivation contexts to inconclusively uphold an argument for an evolution out of the obscure Battle Axe horizon (*e.g.* Olsen 2010).

Developments in Norway are contemporaneous with the establishment of a Northern European Bell Beaker region, particularly in Jutland, Denmark (Prescott 2009; Prieto-Martínez 2008; 2009). Clearly the Bell Beaker developments affected not only Jutland but large parts of western Scandinavia. In Norway, the MNB3-LN1 agro-pastoral breakthrough, and the rapid establishment of farms on a broad front, the transformation of material culture, technology, settlement, and architecture are most reasonably linked to in-

fluences from the BBC. The BBC argument is not only supported by chronological correspondence and dramatic events, but also material elements (Holberg 2000) like a bell beaker (Skjølsvold 1977), tanged-and-barbed bifacial points (Myhre 1979; Prescott and Walderhaug 1995; Østmo 2008; 2011), wrist guards and stylistic elements (Holberg 2000; Melheim 2011). It is reasonable to see the Bell Beaker regions in Jutland as the source of this transformation, though potentially one could argue that southerly western Norway and Jutland were subjected to the same processes. The distribution of type 1 flint daggers (Apel 2001; Prescott 2009; Sarauw 2008) indicate the routes of western Scandinavian interaction (Fig.2). Based on the archaeological materials and the historical developments it has been argued that southwestern Norway (Lista, Jæren) were directly affected by BBC developments, *i.e.* a process of migration and the establishment of alliance networks (*e.g.* Berg-Hansen 2010; Prescott 2009; Prescott and Walderhaug 1995).

The interaction pattern demonstrated by the daggers and the migration/alliance hypothesis are dependent on social institutions and technological know-how that permitted maritime travel over open stretches of sea. This entails perceptions of kinship between these groups – probably resulting from the initial migration processes. It also entails that the open sea stretch across Skagerrak could be crossed on a regular basis, which has led several researchers to argue that the roots of Bronze Age seafaring and maritime technology are to be found at the LN1 transition, and that maritime developments were essential to broader Scandinavian developments (Glørstad 2011; Kvalø 2007; Prescott 2009; Østmo 2008; 2011). The Scandinavian narrative is thus further converted from a scenario of agro-Neolithic evolution to a comprehensive socio-cultural, technological and economic third millennium package introduced through the profoundly transformative force archaeologically identified as the BBC.

A classic BBC-research question concerns the relationship between the preceding Neolithic societies and the BBC. Did the BBC-expression grow out of pre-existing western European Neolithic societies – corresponding material expressions brought about by analogous processes? Or was an externally (through migration or diffusion) supplied package introduced and consolidated through migration, diffusion and dominance? The Scandinavian and Norwegian cases are in this respect particularly interesting, as the mid-third millennium precursors were so heterogeneous, and the processes leading through a short BBC-phase up to the exceptionally homogeneous LN were evidently dissimilar. Above it is argued that the more or less agro-pastoral societies of southwest Norway

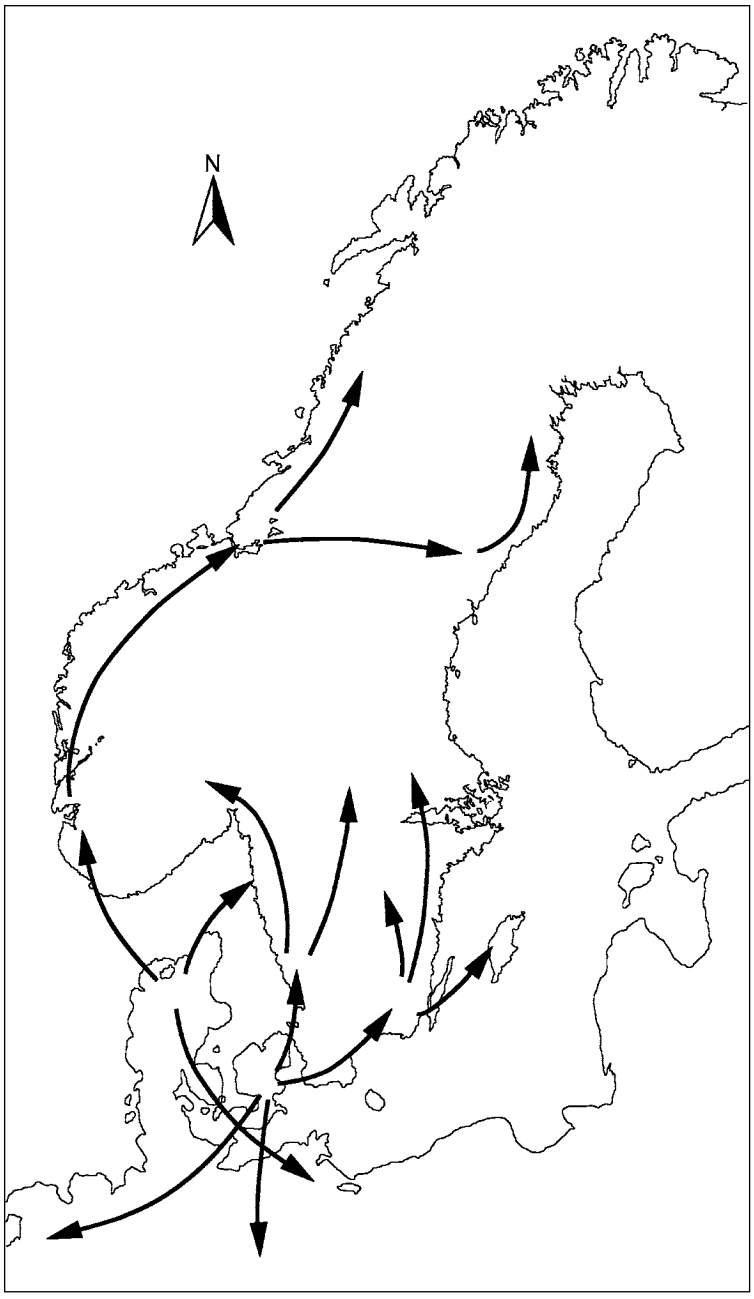

Figure 2. Distribution routes for LN1 flint daggers type 1 suggseting communication routes and networks. (After Apel 2001, fig 9:17).

were transformed through migrations - similar argument could be made for Corded Ware to BBC Jutland. Farther north along the Norwegian coast, pre-LN societies were well-established hunter-gatherer societies.

With the LN-transformation more than 1000 kilometres along the coast with highly variable natural environments were abruptly transformed. It is hard to imagine a migratory process with ensuing population replacement throughout this region. Though a certain level of small-scale migration is a prerequisite for any explanation of this historical switch, explanations must incorporate an indigenous involvement within sectors of the pre-existing hunter-gatherer societies. Finally, eastern Norway is at least in parts characterised by Corded Ware groups. For Denmark, it has been argued for a transformation of similar groups through diffusion (Vandkilde 2005). The above illustrate that three disparate pre-existing societies were transformed, that a valid starting point is that there were variable constellations of processes that transformed them, but that all three trajectories were driven by external forces. The following focuses on the case of the western Scandinavian Peninsula's coast

Northerly western Scandinavia: An unlikely context of transformation?

The transformation of western Scandinavian late hunter-gatherer regions is particularly enigmatic, partly because of the shear distances involved. As such, this case echoes discussions of BBC transformation from northern Africa through Western Europe and into Eastern Europe.

Ecology and niche are two environmental terms that may serve in the present discussion. Carl Butzer (1982, 15) defined ecology as "*functional relationships rather than phylectic or genetic relationships. This is effectively illustrated in the concept of niche*." Fredrik Barth (1964) emphasised the human component here, as "*an adaptation involves people not only in a relationship between natural environment, but also in relation with each other…. …in a human adaptation, cultural factors such as systems of politics and property, and demographic factors, are as vitally involved as are the more commonly considered technological factors*." In terms of northerly western Scandinavia, prior to the BBC expansion an extensive, well-adapted hunter-gatherer population not only occupied the whole region. They had evidently, since the advent of agriculture 4000 BC, actively resisted many of the practices inherent to the BBC life style. In ecological terms: the niche ("*the physical space occupied by an organism, its functional role in the community, and how it is constrained by other species and abiotic factors*", Butzer 1982, 15) was successfully occupied by groups who

had resisted agriculture for 1500 years, who at first glance would have little interest in the third millennium package. The natural environment in question is also contextually important. The Norwegian coast, the fjords and valleys to the east, and the highlands offer a rich and variable environment. However, the rough seas, the coastal streams, frequent storms, long, dark winters with deep snow-falls, and seasonality place a premium on the knowledge of this demanding environment that generations had assembled. Less than 3 % of present day Norway is cultivated – the available percentage would have been substantially less in prehistory with higher seal-levels and available technologies. Potential pastures are more common, but the utilisation of these demands context specific knowledge and practices. Any successful settlement would necessarily demand specific environmental and technological skills and knowledge.

The above human ecological arguments, though partially circumstantial, render a cultural historical style population replacement model unlikely. The massive transfer of knowledge, institutions and practices around 2400–2350 BC still indicate movement of peoples, while the rapid adaptation of new practices to an at times hostile environment indicate the active participation of people with long traditions in the regions.

Developing explanations

> *"Ever since trait distribution and diffusionism were demolished as defensible scholarship, anthropology has stood without any methodology for such comparisons, or for systematic regional work in general …. The stress on in-depth contextual knowledge, …., results in myopic localism, so that we can only compare places and cultures in terms of highly abstracted and partial structures."* (Barth 1989, 641).

In his studies of the sociology of knowledge, Barth creates an energetic dialogue between ideal types, general aspects and specific cases concerning knowledge systems and the transmission of knowledge (1989; 1990; 2002), so that "… *we* [can] *go to the core and identify the dynamo that generates … conceptions, institutions and expressions, and thus avoid the all-to-common exercise of merely coining names for phenomena that remain unexplained* (Barth 1990).

His work is characterised by what is perhaps an epistemological paradox; the exploration of specific cases of history and anthropology through generalizations and abstractions. Archaeology is a strongly empirical discipline, but taking archaeological data seriously does not entail "reading" finds directly, and returning to the naïve empiricism of cultural historical archaeology. Models and ideal types (Weber 1978) generated through anthropology and history

conceptually equip us to create descriptions, *going to the core and to identify the dynamo,* of what might have created the changing patterns that arise from the archaeological record. For studies of mid-third millennium Europe, Barth's observation serves as a warning against concluding without qualification with concepts like "migration", "diffusion", "colonisation", "identity" *etc.* On the other hand, to endlessly develop small scale description, so characteristic of the identity approaches of post-modern archaeology, is hardly viable as historical explanation (Prescott and Glørstad 2011). In the following, a suite of concepts and factors – migration, knowledge systems, societal types and economy – are discussed in an attempt to understand the enigmatic third millennium transition on the Scandinavian Peninsula.

Migration

"Migration" is commonly referred to either critically (and apriori refuted) or as an explanatory outcome in archaeology. The understanding that permeates both usages is often tied to the migration concept of pre-war archaeology: one population replacing/establishing domination over another. After an extended period where migration was virtually taboo (Kristiansen 1991), the empirical and theoretical relevance of migration has been resurrected and is gradually edging towards the centre of archaeological interpretation. A more historically and anthropologically relevant concept of migration has been developed in the wake of David Anthony's work:

> *"…migration has been avoided. …However… viewing the actions of individuals within specific historical contexts, migration can be understood as a behavior that is typically performed by defined subgroups (often kin-recruited) with specific goals, targeted on known destinations and likely to use familiar routes. Kinship linkage and access to information limit many of these behaviors. …, migration can be viewed as a process that tends to develop in a broadly predictable manner once it begins. Social organization, trade relationships, and transportation technology constrain some of these processes. It is by examining in these ways that we can rescue the useful migrationist baby from the properly discarded bathwater.* (Anthony 1990, 395-96).

The present author has argued that a migration from Jutland to southwest Norway (Lista/Jæren) is empirically and interpretatively defensible in explaining third millennium transformations there (Prescott and Walderhaug 1995), that this migration is part of the BBC's expansion (Prescott 2009) and that it is essential to analysis of what happened otherwise along the coast of Norway. The driving forces were economic and ideological, events were made possi-

ble by developments in maritime technology, attractive and familiar environments in SW Norway were targeted, established networks of communication and routes of exchange and interaction were exploited. Still, SW Norway represents a limited geography, proximal to the early BBC settlements in Jutland, and exploitable with technologies familiar from Jutland. The case of the rapid transformation of western Scandinavia north along the coast to the Arctic Circle is more enigmatic, and though migration necessarily must enter the equation, it must be contextualised in a more complicated socio-cultural matrix and qualified as a complex process.

Sociology of knowledge

The comprehensive transformation of the archaeological record is in itself remarkable, but it is indicative of an even more striking change in *mentality* 4400 years ago. It would seem we are dealing with a wholesale adoption of a system of knowledge. This can be deduced from practices (*e.g.* cultivation), social organization (farm institutions and regional interaction), architecture (long houses), style (metal-inspired), technology (bifacial flaking, copper metallurgy, seafaring), cosmology/ideology (predominance of masculine symbols), symbolism (weapons, later rock carvings) and conceivably language (Indo-European?). This important facet of the LN-replacement of one system of knowledge with another entails interaction between people; Knowledge transmission involves two parties, the sender and the recipient. Three structural features thus suggest themselves: The nature of the transmitter, the context of the recipient, and the meeting of the two.

In reference to his studies in Melanesia, Pakistan and Bhutan, Fredrik Barth has defined two ideal types of knowledge systems: the Conjurer and the Guru. This generates "*a perspective which allows us to address and unite a wide range of themes"* and to help account for his observations concerning the distribution of cultural traits. To illustrate the impact of various knowledge sociologies, Barth turns first to the Baktaman, a mountain Ok group in inner New Guinea (Barth 1989; 1990) and describes how knowledge in that context remains valuable only if it is coveted. Sociologically, the reproduction of cultural forms occurs during the interaction between novices and initiators, and here secrecy is at the heart of the system. This *Conjurer system* sets a premium on hedging knowledge and has limited potential for development and dispersion. Barth then turns to another kind of practice, *The Guru*, exemplified by a quote from a Muslim teacher from Bali, Guru Maxfuz: *"There is no merit from... knowledge unless you teach it*." The Guru must reproduce, acquire,develop and transmit knowledge.

Prehistoric archaeology shares with anthropology the problem that with the rise of processual and post-processual archaeology, there has bee a tendency to small-scale and *"myopic localism",* (Barth 1990, 641; Prescott and Glørstad 2011). Barth's observation that differences between the above two ideal systems have diverse formative consequences, as they represent "*the wellsprings of two different informational economies*", opens up a broader historical perspective. The respective impact of the Guru and the Conjurer will be very different. The former with a tremendous potential to spread cultural traits and transform – and perhaps evolve himself -, impacting an area (Barth 1990, 646-47) comparable to the region affected by BBC-developments. The conjurer type, on the other hand, was self-contained and with modest potential to create historical dynamics. Thus the type of knowledge systems described by Barth has implications concerning the historical trajectory, as *"...the two roles propel a multiplicity of actors to do quite different things, and take quite different things into consideration*." (Barth 1990, 642).

Within the expanding Bell Beaker world, systems of knowledge were obviously an important factor that structured the parameters of the historical trajectories and social practices. For example, the role of the above quoted Balinese Guru Maxfuz was not only to teach, but to travel and learn – as has also been argued for Scandinavia's Bronze Age elites (Kristiansen and Larsson 2005; Kvalø 2007) in reference to Mary Helms' (1988) ethnographic studies. A strong propensity for travelling and learning must have been socio-ideologically sanctioned among the Bell Beaker groups of western Scandinavia, and a driving force when the heterogeneous areas, variable resources and challenging environments were drawn together into a field of interaction within a common cultural context.

The situation encountered in late third millennium Scandinavia represents the introduction of a social and cultural order that generates an active communication of a comprehensive system of knowledge - probably based on a scale of interaction mechanisms from voluntary acceptance based on an alluring material culture/a new lifestyle via *threat* of force (Glørstad 2011), to the use of social and physical force, based on the classic sources of social power; economy, ideology, military and political (Mann 1986). The transference of knowledge, the threat of force and the enticement of a Beaker style of life necessitates the physical presence of people from Beaker groups, *i.e.* some form of migration. The rapid adaptation of a Bell Beaker package to a variety of environments also indicates a tremendous structural capacity to learn and adapt on behalf of both immigrants and the acculturated indigenous groups.

We can thus be moderately sure that migration processes were involved in the third millennium transformation of Scandinavia, but along the Norwegian coast direct evidence of the *scale* of migration in Norway is not developed. The ecological aspects reviewed above, the small-scale migration inherent to Barth's sociology of knowledge, new scientific evidence from western European (Parker Pearson *et al.* 2007; Price *et al.* 2004), indicate that migration might involve a small numbers of people, but still have a big impact. Could a few immigrants from societies with knowledge sociology comparable to Barth's Guru ideal type, but combined with the warrior identity suggested by the archaeological data, have the impact seen in Norway? There are compelling arguments to suggest that, yes, this is the case and that a small-scale migration had a substantial impact - integral to explaining enigmatic third millennium developments along the Norwegian coast.

Qualities leading to expansion

The ideal type of knowledge system suggeted above would have been tied to broader political and economic forces within the expanding Bell Beaker-influenced groups. Development of interaction and migratory movements were probably related to an inherently expansive pastoral ideology, bolstered by a male warrior ideal, wanderlust, ideologically encouraged travelling/knowledge seeking, but also resource prospecting in a world rapidly embracing metallurgy and trade in exotica.

If inherent sociological qualities partially explain why systems of knowledge could be disseminated or indeed transplanted when people met, and that characteristics elucidated through the Guru ideal type must have been present, they do not explain the forces involved in the initial migratory movements. What drove BBC-influenced people to move north along the coast of Norway and into the interior? In terms of economy, it has previously been argued that the drive for pastures in societies with strong pastoral components could have been a motivation (Prescott 1995, 134). In terms of technology and production, the strong emphasis on metal re-renders the old idea of travelling prospectors as relevant (Childe 1957; Johansen 1983; Melheim 2011). On a more general level, the BBC-world's drive for exotic objects (like pelts and antler, *e.g.* Prescott 1995, 137*f.*) could have fuelled a prestige exchange, creating a dynamic political economy conducive to drawing ever new groups into alliances and networks. From the more political side of this political economy, competition between newly unleashed entrepreneurs could have generated a vying for new regional alliance partners.

The relevance of these factors is the theme of much discussion concerning late prehistory in Europe. I therefore leave these, to focus on another factor that explains the rapid third millennium transition along the western coast of the Scandinavian Peninsula; qualities inherent to pre-existing hunter-gatherer and mixed economy societies in an interface with expanding BBC-groups.

Internal premises – oppression and a historical opening for the entrepreneur?

By concluding that the two ideal types of knowledge management generate *the wellsprings of two different informational economies,* Barth characterizes dynamic and expansive contexts of the Guru, and inherently also characterizes structural outcomes in the society of Conjurer. Barth (1989, 48) describes the broader societal context of the Conjurer ideal type with the term *entropy*, a steady degradation of a society founded in inertia. The inherent implications in the observations leading to Barth's use of the term, indicates that the outcome of mechanisms of equality is an oppressively stable society. This is congruent with a broader theoretical discussion.

Since the 1960's (but with roots in the 1800's) it has been common for archaeologists to implicitly or explicitly think in neo-evolutionary terms, and regard egalitarian societies as an evolutionary step. An alternative to the evolutionary view is that egalitarian societies are not considered to be a primordial or utopian evolutionary step, but instead the result, if with unintentional consequences (in the spirit of Giddens' [1984] theory of structuration), of an actively created strategy to promote certain power relations, constantly thwarting aspirations to build hierarchies, and to spread or hinder the accumulation of wealth (Wiessner 2002; Sundström 2003). Lévi-Strauss' (1966) discussed the Neolithic paradox and called such societies *cold* – societies that try to stop the forces of history (Glørstad and Prescott 2009). The reproduction of such societies would have been experienced differently by various sub-segments within them, some experiencing the leveling mechanisms as oppressive. Typical tensions generated by such oppression would run along lines of generation, gender and variable skill. The hunter-gatherer societies as well as those with some agro-pastoral production of the Neolithic period in Norway were conceivably cold societies (Glørstad and Prescott 2009, 9).

From this line of reasoning one could argue that the rapid acceptance of BBC modes of thought and society in southern Norway is tied to both external alternatives/pressure provided by BBC expansion, but also concurrent breakdown in internal leveling mechanisms designed to check "entrepreneurs"; the restless young, the

ambitious hunter, metallurgist, herder or sailor. Thus the rapid acceptance of the new socio-cultural order in the mid-third millennium would have been triggered by an alternative to the traditional order fuelling mounting internal pressures within hunter-gather and traditional Neolithic societies. The combination of internal tension and external alternatives conceivably exacerbated strain – the new life style was capital for the disenchanted in endeavours to break the mould of their own oppressively inert societies. In material terms the Bell Beaker/ early Nordic Late Neolithic package offered new objects and technologies that could enhance prestige internally and be used to generate external relations between rising elites (*e.g.* Clarke 1976; Harrison 1980; Johansen 1983; Prescott 1995, 137). In a Norwegian context, the BBC package was a comprehensive material, social, economic and cognitive alternative in opposition to the existing order (Glørstad 2011). There package thus provided media and capital for internal transformation, the allure of exotica and a cosmopolitan world, and a societal model.

If the spread of the mid-third millennium package is the result of an externally provided alternative, eagerly capiltalised by subgroups within the old society, there were probably real threats from expansive external BBC-groups with a demographic growth potential (Vander Linden 2011), expansive social organization, warrior ideology and weapons (Prescott 1995, 136-37; Sarauw 2008). These groups could have been perceived as a very real military, economic and political force – that therfore transformed through coercion. Still, it was probably "soft power", the threats and enticements of a dynamic social order that generated ideological, material and political economic incentives and tools for those who would challenge traditions, which was most influential in facilitating change and made the way of life embodied by BBC migrants so alluring. In a recent article Håkon Glørstad (2011) refers to Marshall Sahlins' (2004) exploration of Athens and Sparta as examples of ideal types of power: Sparta represents terrestrial brute force, Athens represents maritime mobility and trade, and an appealing ideology. Glørstad uses this analogy to suggest that the force of the BBC-package was not in the power of numbers or military organization, though the military expression and the expansiveness were probably genuine, but by the superior attractiveness of the culture in opposition to the traditional order.

Economic strategies as an impetus for changing identity?

Above, a suite of social forces, charted through concepts of ideal types and proposed structural qualities of the societies involved, have been suggested as elements in the abrupt third millennium transformation. In more recent years archaeologists have had a preference for symbolic, cognitive or localized agency as explanatory factors. However, the modes of production, socio-economic technologies and political economy are defining and outstanding features of the third millennium archaeological record of the Scandinavian Peninsula. In archaeological terms a dramatic feature of history in Norway is the introduction of a new mode of production – cultivation and herding – and a farm-based Bronze Age economy. Modes of production carry in them structural properties, and economically driven choices in a given historical situation can have fundamentally long term transformative impacts. A fundamental change in mode of production and economy can also be part of a broader change in cultural identity – which seems to be the situation in third millennium Norway.

Again, there are historical and ethnographic accounts that emphasize economy, and which may serve to illustrate the economic mechanism involved in profound transformation of society like those we see in the third millennium. Gunnar Haaland (1969) describes the plight of *Fur* sedentary hoe cultivators in the Lower Wadi, Sudan. Haaland demonstrates that socio-cultural and structural properties restrict a Fur farmer's opportunity to convert surplus production into other sectors. Farm products may be consumed, but may neither be used as capital or currency. Rights to use land are limited to what can be cultivated for immediate subsistence purposes. Property rights are held in common and there is no inheritance of, or trade in, land. Two strategies can be followed to circumvent these constrictions, and convert agricultural surplus for capital investment. Within a Fur framework, a farmer can organize undertakings like clearing a field or building a house by attracting voluntary labour by providing beer during the project. The scope of these undertakings is limited, as they can be organized for only a few culturally defined undertakings, and because the more resources – beer - poured into them the more the cost-benefit equation deteriorates. Haaland points out that this system does not overcome limitations in a multicentre economic system - values within one subsystem cannot genuinely be converted to another. The alternative for an entrepreneurial Fur cultivator with a surplus in need of being invested is to become a nomad pastoralist. Becoming a pastoralist allows for investment, conversion to capital and the accruement of a further

surplus, starting with the conversion of agrarian surplus to herds. The animal stock is regarded as convertible medium of capital. For the Fur farmer-come-pastoralist the switch to pastoral nomadism is not simply a question of livelihood. It entails changing lifestyle, values, and practices – through time initiating ethnic change and becoming a pastoral *Baggara*.

Language

The structural qualities in Haaland's study serve to demonstrate how the totality of practices, identities and concepts can be bound together. In the Fur-Baggara case this also entails language. In a historical account by Barth (1990), a Guru type knowledge system leads to the spread of Buddhism back to Bhutan, language shift and the spread of Sanskrit. Archaeologists are generally reluctant to discuss language, but the analogies used to generate models relevant to the mid-third millennium transformation of Scandinavia raise the question of language, and are interesting in light of contentions concerning the spread of Indo-European languages in the third millennium, also to Scandinavia (Kristiansen 2005; 2011; Mallory 1989, 257-261; Prescott and Walderhaug 1995; Renfrew 2005). The historical-anthropological case of Sanskrit, as well as explicit discussion of shifts to Indo-European languages in light of more general discussions of language shifts (Ehret 1988; Anthony 2010), indicate that a situation including migration, internal social unrest, external pressures and enticements may lead to the adoption of a new language associated with new economic, political, ideological or military institutions. Thus a well documented transformation of society, economy and material culture could arguably be accompanied by a hypothesized shift to an Indo-European language. Archaeologically, virtually by elimination, the Bell Beaker period is the most, perhaps the only, reasonable candidate for the spread and final entrenchment of a common Indo-European language throughout Scandinavia (and not just Corded Ware core areas of southern and eastern Scandinavia), and particularly Norway (Prescott and Walderhaug 1995).

Concluding remarks

Mid-third millennium Norway witnessed dramatic transformations of virtually all social, economic and cultural institutions, practices and forms in coastal and southerly region north to the Arctic Circle and east to the start of the taiga. These transformations cut across a variable pre-existing landscape of societies – from hunter-gatherers to Corded Ware influenced groups. The transformation is

probably linked to the Bell Beaker horizon of western Scandinavia, and thus extends Bell Beaker geography. In light of the region's environment, geography and variable pre-existing societies, this case study provides perspectives on the broader theme of the Bell Beaker Culture's expansion. Through ideal types and analogies this article suggests a suite of inter-related general factors - knowledge systems and transmission, geographic scale, migration, societal structures, power strategies, economy and identity-, but in relation to a specific historical case. There are numerous conclusions and arguments that are open for discussion and refinement, as are the analogies and ideal types. Hopefully this article still demonstrates the validity of combining analogy, ideal types and specific empirical patterns to understand an anthropological and historical case, with the overarching goal of avoiding, on the one hand, mere description of detailed empirical cases that

> *"…results in myopic localism, so that we can only compare places and cultures in terms of highly abstracted and partial structures"* in an attempt to *" go to the core and identify the dynamo that generates … conceptions, institutions and expressions, and thus avoid the all-to-common exercise of merely coining names for phenomena that remain unexplained"* (Barth 1990).

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Chapter 3

Exploring agency behind the Beaker phenomenon

The navigator's tale

Robert Van de Noort

Abstract

In a break with traditional approaches to the Beaker phenomenon, this paper focuses on the navigators of the craft who enabled particular regions in Europe and northern Africa to become connected in high status networks of exchange, who were of key importance in the geographical distribution of the Beaker, and of transitions of the Beaker design. This emphasis on these individuals, and the craft in which the long-distance journeys necessary to maintain the elite networks were undertaken, illuminates an aspect of the Beaker phenomenon that remains very much under-researched and under-explored: the importance of geographical distance in pre-modern societies. This paper follows the ground-breaking work of the anthropologist Mary Helms, who argued that travelling in pre-literate societies was an important empowering activity as it provided the traveller with esoteric knowledge, alongside exotic objects which bear witness of this knowledge. Because of the power that could be acquired through long-distance journeys, travelling great distances was controlled and limited to select groups in society, and was surrounded by ritualised practices relating to cosmological concepts that linked horizontal or geographical distance with vertical distance, or to concepts of time. This paper, then explores the geographical distribution of the Beaker, and the transition of the Beaker design, from the perspective of the practice of travel rather than the process of distribution, and in doing so reconsiders the role of the agency of the navigators as one of central importance.

Keywords: *Beaker; seafaring, sewn-plank boats*

Introduction: why 'the navigator's tale'?

The Beaker phenomenon can be, and has been, approached from many different angles. Over the last century, the Beaker has been understood as a distinctive marker of a migratory 'Beaker people', as an indicator of elite burial, as a prestige item, as a means of social and political 'enchainment', as evidence for trade and for technological innovation, and as a mark of new ways of consuming and sharing food and drink. Much research has also been undertaken into understanding the chronological development of the Beaker: its origin, provenance and sources of inspiration. But very few people have started to address the question of how processes of transition in Beaker distribution and design came to be so geographically dispersed. The Beaker, whilst geographically scattered through much of western and central Europe, is concentrated in specific regions. In some of these regions close parallel developments in Beaker design can be observed, but this is certainly not always the case.

This paper focuses on the people who made the geographical distribution of the Beaker, and its design transitions, possible: the navigators of the craft that enabled specific regions to become connected in high status networks of exchange. By placing the emphasis on these individuals, I aim to illuminate one aspect of the Beaker phenomenon that remains very much under-researched and under-explored: the importance of geographical distance, and overcoming that distance, in pre-modern societies. Following in the wake of the anthropologist Mary Helms (1988), I will argue that travelling in prehistory was not an activity open to everyone, but that it was controlled and limited to select groups in society. Travelling great distances was surrounded by ritualised practices relating either to cosmological concepts that linked horizontal or geographical distance with vertical distance, or to concepts of time. Such a perspective potentially reveals new layers in our understanding of the Beaker phenomenon.

The navigator's tale

Presenting the navigator's viewpoint provides a new perspective on the Beaker phenomenon debate and enables us to move away from the dominant focus on pottery, potters, and the individuals whose mortuary rituals included Beakers. There are five aspects of the navigator's role that link to our understanding of how Beakers came to be present in disparate regions of Europe and northern Africa. Firstly, the distribution of Beakers and the exchange systems that operated in the late Neolithic and early Bronze Age; secondly the significance of travel in prehistoric times; thirdly, the archaeological

evidence for seafaring and riverine craft; fourthly the socio-political implications emerging from travelling; and finally the role of the navigator himself (and I am sure that these were always men, and usually men of some distinction).

Distribution and exchange systems

On small scale distribution maps, Beakers appear to be almost ubiquitous in western and much of central Europe during the late Neolithic and Early Bronze Age. It is not unusual, especially in older literature, to come across similarly sweeping verbal statements on the distribution of Beaker pottery. However, larger scale maps reveal a more distinctly regional distribution. This uneven distribution of the Beaker appears to be more pronounced than that of the earlier Corded Ware beakers found in the first half of the third millennium BC. For example, the All-Over Ornamented (AOO) Beaker, generally assumed to be an innovation of the Corded Ware Beaker in the lower Rhine region, is frequently found both in the lower Rhine valley and also further upstream, as well as in Britain; but it is only occasionally found elsewhere in western Europe. (Lanting and Van der Waals 1976). The more common Bell Beaker, a type that possibly evolved from the AOO Beaker, has a much wider distribution in Europe and northern Africa, but this type of pottery is also found to be concentrated in specific regions (e. g. Harrison 1980).

In the most up-to-date published distribution map of Bell Beakers (such as the one presented in Vander Linden 2007), its presence is clearly concentrated in specific regions. In Ireland, for example, it is found on the northeast coast, in the Boyne valley, the Wicklow/Dublin region and the Shannon valley. In Wales, the Bell Beaker is principally present only in the south and west; in Scotland it is concentrated in the lowlands, and in England distinct concentrations are noted in Wessex, East Anglia, East Yorkshire and further north along the North Sea coast. In continental north-western and central Europe, the principal concentrations of Bell Beakers are found in northern Jutland, on the French Atlantic coast, and along the major rivers including the Rhine, Seine, Elbe and Danube, and also on the River Vistula in southwest Poland. In southern Europe, the main concentration is on the French Riviera, extending northwards up the Rhone valley and southwards along Spain's Mediterranean coast. Coastal concentrations include Andalusia in the Mediterranean and Galicia on the Atlantic Ocean. Further concentrations in Iberia are found in the middle reaches of the River Ebro and the upper reaches of the Duoro, as well as the lower and middle reaches of the River Tagus and in the Guadalquivir valley. Further east, Bell Beakers have been found concentrated on northwest Sardinia, the west and south

coast of Sicily and, mainly as fragments, in the Po valley in Northern Italy. Finally, Bell Beakers have been found in burials in north-western Morocco. In between, and beyond, these areas of concentrations of Bell Beakers are extensive tracts of land that have to date produced very little evidence for this type of pottery.

It has long been established that the Beaker phenomenon encapsulates distinct regional manifestations, for example in the accompanying grave goods with which Beakers have been found, or in the context of the Beaker finds themselves, which is not limited to burials (e. g. Clarke 1970; 1976; Shennan 1976). Beaker burials have frequently been found to include 'exotic' objects that have a material provenance outside the region in which they were discovered; such exotica are understood to have acted as prestige goods (Rowlands 1980; Shennan 1982; 1986; Bradley 1984; Barrett 1994; Harding 2000). It has been noted that many of these exotic artefacts are translucent (amber and faience), or reflective (polished metals, obsidian, and jet), and also that artefacts and jewellery are rarely found as grave goods in the regions where the material originated (Van de Noort 2006). However, there is little evidence that Beakers themselves were exchanged over great distances. Where the clay used in their production has been analysed, the results have consistently shown that local sources were utilised (see: Vander Linden 2007, 346).

How can the distribution of Beakers, and its distinct regional manifestation, be explained? The current consensus is that the Beaker phenomenon, and especially the Bell Beaker phenomenon, cannot be the result of migration or diffusion processes alone. Such processes would have produced, respectively, territorial units or more even distribution patterns across Europe. The emerging consensus of opinion was discussed recently by Barry Cunliffe (2001, 215-6), who described the Beaker phenomenon as a way in which individuals were celebrated through the inclusion of 'techno-symbols' that defined their status at burial. He noted that the speed with which this belief system was adopted in distinct regions across western Europe suggests that networks of exchange were already in place by 2500 cal BC, and that regional societies had become sufficiently complex to include elite groups as the new 'consumers' of the Beakers and associated objects. We can infer from this that the exchange of prestige goods was only ever one element in the elite exchange networks. The sharing of ideas and concepts, from the latest Beaker design to the role of important individuals in society, as well as, presumably, cosmological issues, completed the Beaker phenomenon.

It is possible that these elite exchange networks developed in parallel with the exchange of copper and gold. Especially in north-western Europe, the introduction of the Bell Beaker and the earliest metals seem to coincide (e. g. Pare 2000). Indeed, some have argued that the first Bell Beakers were introduced or used by the first metalworkers (e. g. Brodie 1997), a point also proposed by the excavators of the Amesbury Archer in Wessex (Fitzpatrick 2002). Detailed analysis on the latter provides clear evidence, in the form of stable isotope analysis, that he had grown up somewhere in central Europe, whilst the grave goods with which he was buried showed him to have had contact, directly or indirectly, with distant regions in Europe.

The significance of prehistoric travel

In archaeological discourse, the idea of travel has been given a poor hearing when it comes to explaining cultural change. Instead, archaeologists have customarily ascribed cultural change to diffusion, migration, assimilation, acculturation, environmental determinism, neo-Darwinian cultural evolution, peer-polity interaction, colonialism or agency (cf. Trigger 1996). Selecting any of these mechanisms as responsible for causing cultural change is always a matter of inference, and it is more than a little surprising that the archaeologically demonstrable activity of travelling has not been considered in this context before. The advent of stable isotope analysis has given impetus to the idea (and some evidence) that individuals travelled, sometimes over relatively short distances and possibly as marriage partners (e. g. Price *et al.* 1998; 2004), other times over much larger distances such as in the case of the Amesbury Archer. However, another body of archaeological evidence for the great distances travelled in the Early Bronze Age, that of Bronze Age seafaring craft, has in the main been ignored in this debate (cf. Van de Noort *et al.* 1999).

This neglect is particularly surprising in view of the importance attributed to travel by anthropologists, and the fact that this attribution is nearly a century old. The best known anthropological example of the study of travel remains Bronislav Malinowski's (1922) *Argonauts of the Western Pacific*, which revealed the remarkable seafaring prowess of the Trobriand Islanders, the socio-political importance of travel and the significance of reciprocal exchange. The study explained how the value attributed to objects was directly linked to their cultural biographies, which incorporated their journeys, and also how the political status of local leaders was directly related to the ownership and ceremonial display of these valuables. Others anthropologists have developed these concepts, and Mary

Helms' (1988) *Ulysses' Sail; an ethnographic odyssey of power, knowledge, and geographical distance* offers a cross-cultural perspective on the significance of travel. She argues that in a-literate societies, travelling offers individuals and groups within societies the only chance to increase knowledge and understanding, once the social memory of one's locale has been exhausted. Only by travelling and visiting remote groups, or by being visited by an outsider, can new materials, technologies or ideas be obtained. And these acquisitions can then produce innovations and cultural change.

In her work, Helms noted that travelling beyond certain boundaries is not an option for everyone in society. Indeed, travelling great distances is nearly always restricted to certain individuals or groups, and these frequently include people representing those with privileged positions, such as heralds or royal messengers, or those who define their position near the edge of society: priests, missionaries, pilgrims, traders, seafarers or warriors. Whilst there are often good economical reasons to limit access to imported materials and marketplaces for the individuals and groups involved in long-distance travel, the social context of restricting travel is really about power relationships within societies. Importantly, travel provides opportunities to gain objects and materials imbued with special powers or properties, ranging from the strength of bronze weapons and tools to the magical powers that may have been attributed to translucent and reflective artefacts. Such objects can bestow a privileged position onto individuals who display them, in the form of an amber necklace, for example, or a golden lunula. Even more importantly, travellers gain knowledge and understanding from different societies. Such esoteric knowledge, which could include a new understanding of cosmology or the moon calendar, would have elevated the socio-political and ritual position of the traveller once they returned to their own society.

This brings us to the core of Helms' argument: many societies across the world metaphorically connect geographical or horizontal distance with time or vertical distance. Thus, undertaking great journeys connected travellers with their ancestors or gods, or brought them closer to heaven. Exotic objects provided the material evidence of the journey, and were displays of the knowledge and understanding gained during it. In several recent studies following Helms' premise, it has been argued that such esoteric knowledge could have played a decisive role in the emergence and reproduction of social differentiation in the later Neolithic and Early Bronze Age (*e.g.* Needham 2000; 2009; Kristiansen 2004; Kristiansen and Larsson 2005; Van de Noort 2003; 2006; 2011). Helms notes that many long-distance journeys often commenced with, and were com-

pleted by, elaborate rituals. The fact that these rituals frequently related to specific cosmological schemes, such as ancestor veneration, reinforced the important position of seafarers and navigators. The same would have been the case in prehistoric societies.

The maritime evidence

Over the last five decades, the body of evidence for maritime activity in the Bronze Age has grown considerably. The most important contribution has been made by the discovery, beginning in 1937, of a number of sewn-plank boats in England and Wales, and more recently the re-dating of all known sewn-plank boats to the Bronze Age (Wright *et al.* 2001). The sewn-plank boat is constructed from planks that, in the absence of iron nails or treenails, were sewn together using withies made of twisted strands from yew branches. The planks had bevelled edges to ensure a close fit and moss was used for caulking, making these craft reasonably watertight. In order to give the hull stiffness, the internal frame comprised a system of cleats that were integral to the planks, through which transverse timbers were placed (Figure 1).

From England and Wales, ten sewn-plank boats are currently known. Three have been found on the North Ferriby foreshore (known as Ferriby-1, -2, and -3, or F1, F2 and F3; Wright 1990), and one at Kilnsea, in the Humber estuary (Van de Noort *et al.* 1999). Another was found in the River Ancholme, a tributary of the Humber, in the town of Brigg (McGrail 1981). Three craft have been discovered on the Welsh side of the Severn Estuary: two

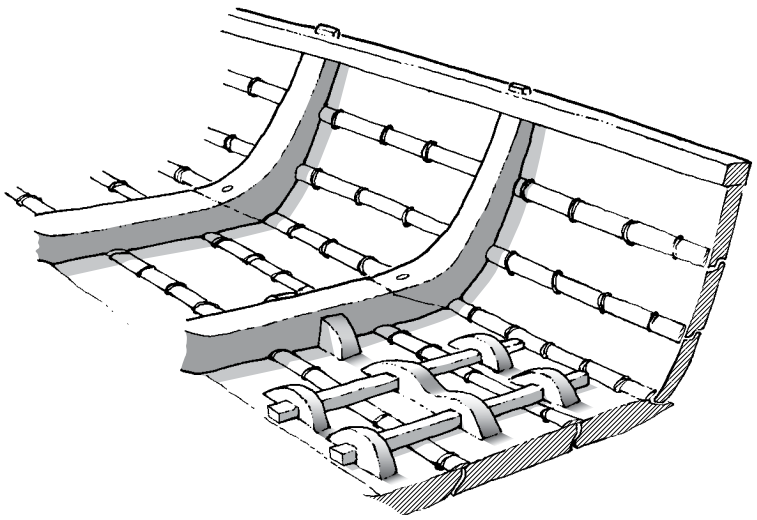

Figure 1. A schematic representation of a sewn-plank boat (from Van de Noort 2011, 161).

Sewn-plank boat	Date	Reference
F3	2030–1780 cal BC	(Wright *et al*. 2001);
F2	1940–1720 cal BC	(Wright *et al*. 2001);
F1	1880–1680 cal BC	(Wright *et al*. 2001);
Caldicot 1	1870–1680 cal BC	(McGrail 1997);
Kilnsea	1750–1620 cal BC	(Van de Noort et al. 1999);
Dover	1575–1520 cal BC	(Bayliss *et al*. 2004)
Testwood Lakes	c. 1500 cal BC	(Fitzpatrick pers. comm.);
Goldcliff	c. 1170 BC	(Bell *et al*. 2000);
Caldicot 2	c. 1000 cal BC	(McGrail 1997);
Brigg 'raft'	825–760 cal BC	(cf. Switsur in McGrail 1981).

Table 1: Dates of sewn-plank boats.

from Caldicot and one from Goldcliff (McGrail 1997; Bell 1992; 1993; Bell *et al*. 2000). One sewn-plank boat fragment was discovered from the River Test, which has its confluence in the Solent, at Testwood Lakes (Fitzpatrick *et al.* 1996). The tenth sewn-plank boat was discovered in the River Dour in Dover (Clark 2004). A re-dating programme of the older finds, which progressively removed the organic substances such as oils and sugar used in the preservation of the discovered craft, revealed that the oldest craft is F3, which dates to around 1980 cal BC; the other craft from North Ferriby are slightly younger (Wright *et al.* 2001). Combining these results with the radiocarbon dates of the other sewn-plank boats has shown this type craft to be exclusive to the Bronze Age (Table 1).

The sewn-plank boats possibly developed from the construction of hide- or skin-covered boats (e. g. Van de Noort *et al.* 1999; Coates 2005). There is no archaeological evidence for this type of craft, and such evidence is unlikely to be forthcoming as hides and skins can only be preserved in acidic conditions, and the sea is naturally alkaline. However, it has been noted that in nearly all regions of Europe, the oldest paddles are often much older than the oldest wooden boats, and this implies that non-wooden types of craft were used (Lanting 1997/8). It has also been observed that the oldest of the sewn-plank boats are sophisticated constructions, and that aspects of their construction, such as the sewing of the planks or the insertion of the frame, would also have featured in any hide-covered craft (Van de Noort 2011). The transition from hide-covered boats to sewn-plank boats must have been made with the intention to construct more seaworthy craft. Although the plank boats were heavier, requiring considerably more effort to propel and steer than any hide-covered craft, they were also much larger and thus could ride waves more easily. They could also carry significantly greater dead-weights than a hide-covered boat.

Research on the archaeological context of the sewn-plank boats from England and Wales has been published in some detail elsewhere (Van de Noort 2003; 2009; 2011), and a summary of the findings suffices here. The boats from North Ferriby were found in what can best be described as an early shipyard. For example, F2 and F3 were boat fragments that had been placed on roundwood alder timbers, as if awaiting repair, whilst the Ferriby foreshore produced large amounts of oak 'chips' with bronze axe marks. The landscape context of several craft, including Kilnsea, Caldicot 1 and Dover, contained earlier monuments or burial mounds, some with Beakers; it has been argued that this reflects the notion that the departure to, or arrival from, distant places was made with reference to the ancestors (Figure 2).

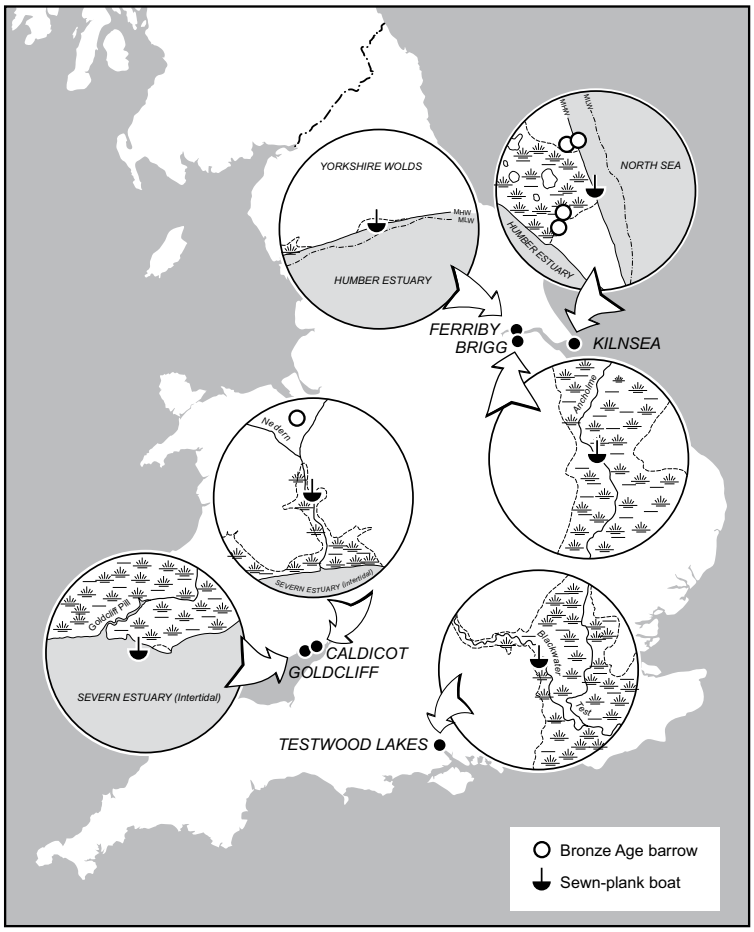

Figure 2. Schematic representation of the context of sewn-plank boats, with the Dover boat omitted because of the urban context of the find (from Van de Noort 2011, 184).

It also reflects the cosmological notion that geographical/horizontal distance and time/vertical distance were connected. A third group of boats, including Caldicot 2, Goldcliff, and Testwood Lake, were found as fragments accompanied by other votive deposits, and were incorporated into or functioned as trackways, bridges or jetties. This can be explained by the use of *pars pro toto* concept, with fragments from the boats being used in social practices such as enchainment (Chapman 2000); a boat fragment represented the cultural biography of the complete boat, including its experience in travelling safely. Finally, the Brigg 'raft' had probably sunk, but this boat was also found near a bridge or jetty over the River Ancholme at a place where many votive depositions took place in the Bronze Age. To an extent, the observed changes in the contexts of the boat

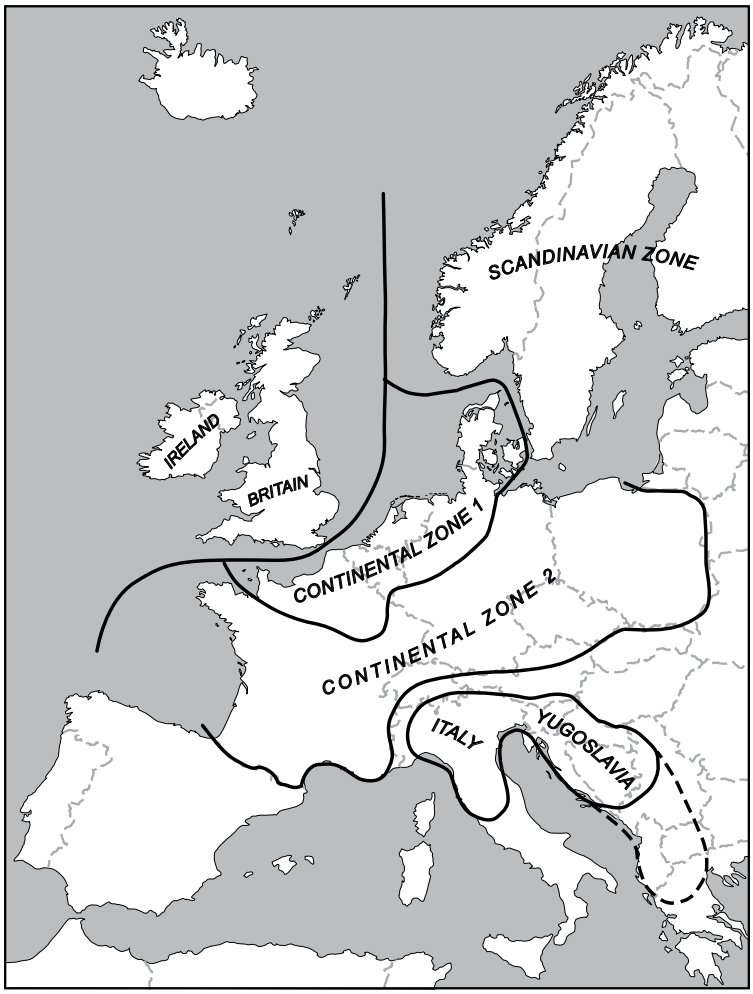

Figure 3. Map of the diffusion of logboats (according to Lanting 1997/8).

finds correspond with their age: the craft dated to before 1500 cal BC are linked to ancestor veneration, whilst those dated to after 1500 cal BC have been found as fragments incorporated in other structures.

Apart from the evidence for seafaring activity, the archaeology of riverine traffic also suggests increased levels of activity in the Bronze Age. In an analysis of the dates of hundreds of known logboats in Europe, Jan Lanting (1997/8) produced some fascinating new insights (Figure 3).

He noted a core region, comprising Denmark, north-west Germany, the Netherlands and northern France, where logboats were made from the Mesolithic onwards, ranging from the very small and crude logboats of Pesse in the Netherlands and Noyen-sur-Seine in France to the longer and quite sophisticated lime logboats from Tybrind Vig in Denmark. For the rest of Germany and France, and in Switzerland, Austria, the Czech Republic and Poland, logboats are generally of a later date, and only in the Bronze Age do we find these craft in the upper reaches of the Rhine and Danube. The oldest logboats in Ireland are probably of Neolithic date, but in Britain the oldest logboats are dated to the Early Bronze Age.

This research is now a little dated as many more finds of logboats have been made in recent years. These recent discoveries, however, have only served to reinforce the general findings of Lanting's meta-analysis. For example, prehistoric logboats recently discovered in Britain, such as those at Carpow in Scotland (Strachan 2010) and Shardlow in England, are all of Bronze Age date, as is the logboat from the Degersee in southern Germany (Mainberger 2009). In fact, Lanting's zonation of the earliest logboats in Europe, if not his explanation of the diffusion of the idea of logboats, remains intact. In other words, the evidence clearly points to the increased use of logboats on Europe's rivers and lakes in the Bronze Age, which implies that existing networks of exchange expanded at this time, or the intensity of exchange increased.

The socio-political implications emerging from travel

Despite early calls to consider the socio-political role of seafaring (Muckelroy 1978), this topic has been paid scant attention to date. In considering this topic for the period when Beakers were in transition, the socio-political implications emerging from travel include both the place of travellers within society and the socio-political processes aboard ships.

The archaeological evidence from grave goods is unequivocal in indicating that access to, and the display of, exotic goods was the preserve of the few. Earlier debates on whether these few were the political elite or a priest caste have now largely evaporated, as the separation of political and ritual power for the Early Bronze Age is now considered to be something of an anachronism. Stuart Needham (*e.g.* 2000; 2009) has in recent years repeatedly stressed the importance that exotic goods had in the emergence of powerful individuals in the Early Bronze Age in Britain, and it is very likely that similar processes happened elsewhere in western Europe, albeit at slightly different times and with different emphases in terms of the material culture involved. In his most recent article on this topic, Needham uses the Early Bronze Age drinking cups of gold, silver, amber and shale from both sides of the English Channel, and from the Rhine, to identify the 'Channel/southern North Sea maritory'. This is defined as a 'high-flux sphere of maritime interaction used for the execution of certain specialist maritime exchanges' (Needham 2009, 18). This maritory extended into the main river valleys, notably the Rhine, Meuse and Seine. Active participation in these specialist maritime exchanges produced a set of shared and reciprocal interests, bringing exotic goods, esoteric knowledge and power to the participants. We must assume that a maritory, unlike a territory, would have been a dynamic entity, forever changing and opening up to new participants. This dynamism, which included the changing design and decoration of Beakers, was an essential component in enabling the elite participants to retain their elevated positions.

Building on Mary Helms' concepts of the significance of travel, it could be argued that the authority derived from an exotic object, such as an amber necklace or the latest Beaker decoration, would be significantly greater if the bearer or owner had been involved personally in its acquisition. After all, the (magical) value of these exotic objects symbolized the esoteric knowledge that was obtained from distant societies, and separating the acquisition from the end-use would have undermined the value and significance of objects and knowledge. It may have been the case that this acquisition involved obtaining a marriage partner, probably a wife, who would bring such objects and knowledge with her.

I have argued previously (*e.g.* Van de Noort 2006; 2011) that the practice of undertaking long-distance journeys was not without social consequences itself, and that in the case of journeys involving boats, the latter functioned in effect as a heterotopia. The concept of the heterotopia was developed by Michel Foucault (1966/1970), and it represents a real place where a society is simultaneously represented, contested and inverted, in effect being the opposite of the

utopia (see Van de Noort 2011, 33-4 for a more detailed explanation). Long-distance journeys involving boats, be they journeys by sea or on Europe's major rivers, would thus constitute heterotopias, with their internal social and political dynamics including not only the crew of the boat but also the boat itself, the sea with its cosmological connotations, and the distant lands and peoples that were to be visited.

Focusing on the social and political dynamics during the long-distance journeys, the interaction that took place between the members of the crew is of particular interest. Alongside the person who sought to acquire the exotic objects and esoteric knowledge, the majority of the crew of a sewn-plank boat consisted of some 16 to 20 paddlers, most probably young men who were physically fit, but who did not necessarily possess any advanced knowledge of seafaring. We can safely assume that the person who sought to acquire the objects and knowledge, with or without the marriage partner, was an aspiring member of the elite who undertook the journey as a prerequisite for taking on a role as a leader. However, whilst the objects and knowledge provided a justification for his elevated position in society, the heterotopia provided the context that gave him real power: the development of his crew into a personal retinue, a group of same-aged men who, through the shared experience, bonded and created a basis of power after the journey had been completed (see also Van de Noort 2011, 179-87).

The importance of the navigator

Alongside the aspirant leader and the paddlers, the crew of the sewn-plank boat must also have included a navigator. This was somebody who had advanced skills in environmental navigation, and used his knowledge of coastlines, currents and swell, animal behaviour including that of seabirds, fish and sea mammals, and the subtle differences in the colour of the sea, in steering the boat to its destination. The navigator may have been skilled in reading the stars; even a very basic understanding of astronomy, such as the ability to identify the North Star or Pole Star, was invaluable in directing a boat at sea in the desired direction of travel. Alongside skills in environmental navigation, the navigator was also the most likely person to understand the networks of exchange, and to know the geographical locations of the communities that needed to be visited during the long-distance journeys. He may also have been able to speak foreign languages, or alternatively the *lingua franca* that was used between navigators (Needham 2009, 19).

As noted earlier, it is very likely that possession of the knowledge required to undertake long-distance journeys successfully was restricted to the navigator. This was partly for practical reasons; restricted access to navigational skills provides a barrier against mutiny. However, this knowledge was restricted principally because it was held to be sacred. Understanding where to steer the boat was not merely a matter of dead-reckoning, but required the navigator to be in touch with the sea and winds, with seabirds and fish, and with the gods, ancestors and spirits who resided in all these. If the navigator was able to read the stars, and if objects such as the *Himmelscheibe* from Nebra were used as navigational aids (Meller 2002), then both the connection between horizontal and vertical distance, and the ritual aspects of long-distance journeys, would have been greatly reinforced.

The navigator may also have been the person who held the knowledge of building the great craft, such as the sewn-plank boats, that were required for these journeys. From evidence ranging from the ships depicted in rock carvings in Sweden's Bohuslän and Norway's Østfold regions, to the ships engraved on razors and swords from Denmark (*e.g.* Kaul 1998), it is apparent that ships held a central position in the cosmologies of Bronze Age societies. Thus the shipwright needed both technical and ritual skills in building a sewn-plank boat, and these may have been held by the navigator. It is possible that as the 'master of hard materials', the navigator/shipwright may also, as recently argued by Mary Helms (2009, 157), have had early knowledge of metal working. Whilst this remains difficult to prove archaeologically, it has to be acknowledged that early metal working would also have required technical and ritual skills, and that the navigator had opportunities to gain understanding of metal working, and of the materials used in metallurgical processes and exchanged within the networks. If these reflective materials had been imbued with magical properties, then it is likely that access to, and knowledge of, these materials would have been restricted to certain individuals, with navigators among them. Recognizing that the regions where Beakers have been most frequently found are connected by seas and rivers, it may have been the case that in the period between 2500 and 1500 cal BC, navigators controlled the directional nature of the travel and exchange. Their power was based on a combination of technical skills, such as expertise in environmental navigation and possibly of shipbuilding, and ritual skills. These skills may well have been passed down through successive generations of navigators.

Conclusion

By shifting the dominant focus from the *process* of change to the *practice* of change, this paper has sought to add a new layer of understanding to the debate on the distribution of the Beaker phenomenon in Europe. The key points to emerge are that:

- the Beaker as an archaeological find is concentrated in distinct regions that all have access to the sea or major rivers, and that this implies the existence of an exchange network involving elite groups who exchanged exotic objects across the water;
- the exchange networks were maintained by people travelling between the regions, that travel was surrounded by cosmological connotations which required ritual skills from those who undertook long-distance journeys, and that travel was restricted to certain individuals who gained power in the form of exotic objects and esoteric knowledge;
- the Bronze Age is a period that saw the development of a new type of seafaring craft, the sewn-plank boat, which would have been suited to undertake the long-distance journeys required for maintaining exchange networks; and that evidence in the form of logboats indicates that rivers became increasingly important during this period as arteries for travel and transport;
- the long-distance journeys provided opportunities for aspirant leaders to gain power, both in terms of acquiring exotic goods and esoteric knowledge, and in developing a loyal retinue from the crew of the boat;
- the navigator played a key role in the exchange networks, not just by steering the boat but also integrating the technical and ritual skills that enabled the networks to flourish for a prolonged period.

In short, the navigator was a key agent of cultural change in the period when Beakers were in transition in Europe, enabling the practice of travel and exchange of goods and knowledge to flourish into what we now refer to as the Beaker phenomenon.

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Chapter 4

The end of the Neolithic in Western Switzerland

Peopling dynamics through nonmetric dental study

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Abstract

The Entity at the end of the European Neolithic, the Bell Beaker phenomenon, although difficult to define and explain as a whole, has benefited from diverse and varied interpretations. Such difficulties are due to its broad geographic distribution and complex cultural components. For several years now, research in the Laboratory of Prehistoric Archaeology and Anthropology at the University of Geneva has focused on research into the scale of this phenomenon. Through four complementary axes of research (typology and chronology of common ware pottery, territorial occupation, copper metallurgy and dental anthropology), the objective is to identify the modes of transition governing the transition from the Final Neolithic to the Bell Beaker.

Emphasis is placed in this contribution not only on one of the research axes - dental anthropology -, but also on a region in which the expression of the Bell Beaker is all the more interesting for the varieties of its components: Western Switzerland. The objective was to determine, by the analysis of nonmetric dental traits, whether the emergence of the Bell Beaker coincided or not with population renewal. Finally, the results provided by dental morphology are discussed and compared with other components, primarily cultural, in order to propose a scenario for settlement in Swiss territory at the end of the Neolithic.

Keywords: *Peopling history, Western Switzerland, Prehistoric Archeology, Neolithic, Bell Beaker, Bioanthropology, dental nonmetrics*

Introduction

During the first half of the 3rd millennium BC, Europe is characterized by the presence of regional cultural groups limited in space, with the exception of the Corded Ware culture which, in the eastern area, already forms a geographically significant group. By contrast, during the second half of the 3rd millennium BC, one observes the emergence of a vast cultural unit encountered across all of Europe: the Bell Beaker complex.

For some researchers, the Bell Beaker complex designates only a type of pottery - decorated and in the form of an inverted bell. In our research, the Bell Beaker is defined as a cultural unit that distinguishes other archaeological manifestations, not only by its particular broad geographic extension, but also by the complexity evident in its archaeological remains. What do we know of the Bell Beaker today? It developed across Europe on very different local cultures following a southwest-northeast gradient during the 3rd millennium BC. It is constituted by a unifying material culture and by varied funerary and domestic structures.

Initial interpretations regarding the appearance of the Bell Beaker complex were principally based on the pan-European nature of the decorated pottery. This specificity engendered a number of detailed and colorful scenarios, complementary or not, navigating between population movements, the circulation of goods or of ideas. Nowadays, the differences and the less unusual elements of the material culture, which are quantitatively more significant, are being analyzed and demonstrate a clear opposition between the western and eastern areas of the Bell Beaker complex.

In this paper, we present the results of a biological anthropological study included in an interdisciplinary research program focusing on the modes for the origins of the Bell Beaker complex. This is developed through the analysis of a region affected by this entity at the end of the European Neolithic - Western Switzerland. The objective is to determine, through the analysis of people linked to the Bell Beaker complex and more specifically the study of their nonmetric dental variability, whether the emergence of this entity coincides or not with population renewal. The results presented are discussed and compared with interpretation resulting from other components - anthropological, biological and cultural.

The Bell Beaker phenomenon

The Bell Beaker complex was established on a Europe-wide scale, with quite different preceding local cultures. Between the uniform pre-Bell Beaker base (the Corded Ware Culture) in the east, and the

heterogeneity observed in the west, data can be difficult to compare. The Bell Beaker complex is characterized by material including decorated pottery - the common denominator of this culture -, common ware ceramics varying by region and diverse artifacts including wristguards, tanged daggers, Palmela points and V-perforated buttons. While these artifacts unite the Bell Beaker complex, the incontestable diversity of its funerary and domestic structures blurs the overall uniformity. From the individual grave, re-use, collective tombs and incineration, the funeral practices of the Bell Beaker reveal its complexity (Besse and Desideri 2004). Similarly, variability in domestic structures, whether with respect to construction (on posts or dry-stone), form (circular, oval, rectangular), or location (near or far from local cultures), is clear (Besse and Desideri 2005). The Bell Beaker complex developed during the 3rd millennium BC, between 2900 and 1800 BC, and a southwest-northeast gradient for its appearance and expansion has been demonstrated (Guilaine 1998; Müller and Van Willigen 2001; Bailly and Salanova 1999). Initial explanations for the emergence of the Bell Beaker were primarily based on the pan-European character of certain types of artifacts and varied between population movements, exchange of goods and exchange of ideas (Childe 1925; Del Castillo 1928; Sangmeister 1963; Lanting and Van der Waals 1976; Clarke 1976; Gallay 1997–1998). Today, research focuses on divergences, analyzing large territories using specific artifacts. The less exceptional elements of the material culture, such as common ware ceramics (Lemercier 2004; Besse 2003; 2004) and lithics (Bailly 2002; Furestier 2007), express and demonstrate a clear dichotomy in the Bell Beaker complex that opposes the eastern and western areas of this phenomenon.

Anthropological studies are not lacking, from local to pan-European scale, and range from the analysis of cranial morphology to the chemical composition of bones. Mobility, partial, total, or varying depending on the approach employed, is often associated with the appearance of the Bell Beaker complex. The specific cranial morphology of Bell Beaker individuals forms the basis for this interpretation: a brachycephalic skull with flattened occipital. Such morphology has long been considered as definitive proof for population movements during the emergence of the Bell Beaker period (Menk 1979; 1981). Today, other approaches, such as isotopic geochemistry of bone (Chiaradia *et al.* 2003; Price *et al.* 2004) and nonmetric traits (Desideri and Eades 2004; Desideri 2007; Piguet *et al.* 2007; Desideri and Besse 2010), are being applied.

To explain the mechanisms associated with the appearance of the Bell Beaker complex, it is necessary to work in a broad territory since this is a phenomenon extended across Europe. It is in this

perspective of a broad vision of the Bell Beaker that an interdisciplinary research program was created. This program aims at a better understanding of the modes for the appearance of the Bell Beaker complex by evaluating the importance of the Neolithic base in its establishment. It includes four complementary axes: typology and chronology of common ware pottery, territorial occupation, metallurgy and biological anthropology.

The Bell Beaker phenomenon in Western Switzerland

We examine the modes for the establishment of the Bell Beaker complex at a regional scale: Western Switzerland. The Swiss territory is located in an intermediate position between the southern and eastern domains. The archaeological record, unequally distributed in Switzerland, reveals the duality of the traditions of the different east-west cultural areas. The Bell Beaker complex appears during the second half of the 3rd millennium BC, at the end of the Neolithic, and preceded the emergence of the Early Bronze Age.

The Final Neolithic is marked here by a strong littoral occupation in the Three-Lakes region and around Lake Leman of the Lüscherz and Auvernier-Cordé cultures. In Valais, the human presence intensified with an occupation of all of the biogeographic stages (Curdy *et al.* 1999; Luginbühl 2006) (Fig. 1 and appendix A).

The beginning of the Bell Beaker complex itself is marked by the abandonment of lacustrine site in the 25th century BC, a phenomenon observed at all of the Swiss lakes and in the French Jura (Hafner and Suter 2003). While the abandonment phase of lake shores are well correlated during the Middle Neolithic with lacustrine transgression phases linked to period of climate decline (Magny 2004), the situation differs at the start of the Bell Beaker period since 2400 BC marks the start of a climatic optimum marked by an important regression in lake levels accompanied by a prolonged retreat of alpine glaciers (Magny 2006). In other words, although conditions seem to have been ideal for Bell Beaker populations to settle on lake margins, no evidence of their presence at littoral sites has been found apart from isolated finds (Bill 1976; Eberschweiler 1999). Several environmental hypotheses have been proposed to explain this situation, such as the erosion of littoral sites or lacunae in sedimentary sequences, but none seem convincing. We prefer to advance the hypotheses of cultural choice (Magny 2006) or defensive preoccupations (Pétrequin *et al.* 2005) to explain littoral occupation or lack thereof, which tend to put into perspective the role of climatic determinism in the periodization of lacustrine sites and the relative social calm. The discovery in recent years of Bell Beaker sites

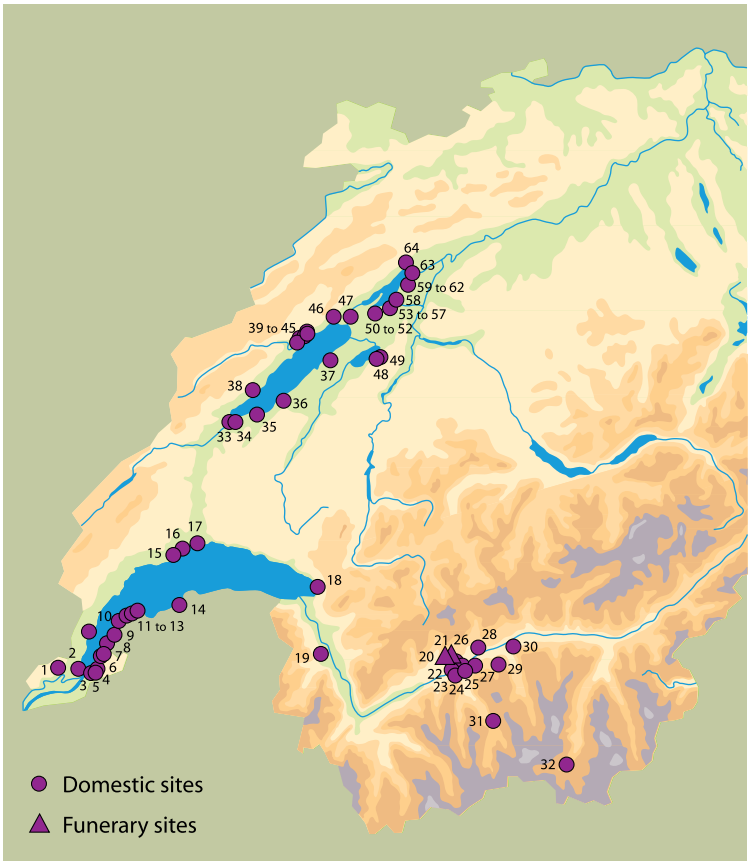


Figure 1. Final Neolithic sites in Western Switzerland (identification numbers refer to appendix A).

on the Bevaux Plateau and in the Jura have demonstrated the existence of Bell Beaker settlement in other topographic zones previously unoccupied, suggesting the intentional occupation of the hinterlands (Fig. 2 and appendix B). At the beginning of the Bell Beaker period, we witness a delocalization of sites, a phenomenon observed in other regions affected by this cultural group, such as Provence and Navarre (Bailly 2002; Besse and Desideri 2005).

In contrast, the Bell Beaker people continued to use the same funerary spaces used at the end of the Neolithic. The exceptional megalithic area of Petit-Chasseur at Sion (canton of Valais) is an excellent example of this. The Bell Beaker occupants built their own monuments within the megalithic area already frequented by their precursors. They constructed several dolmens and cists and reused an earlier structure (Bocksberger 1976; Gallay 1986).

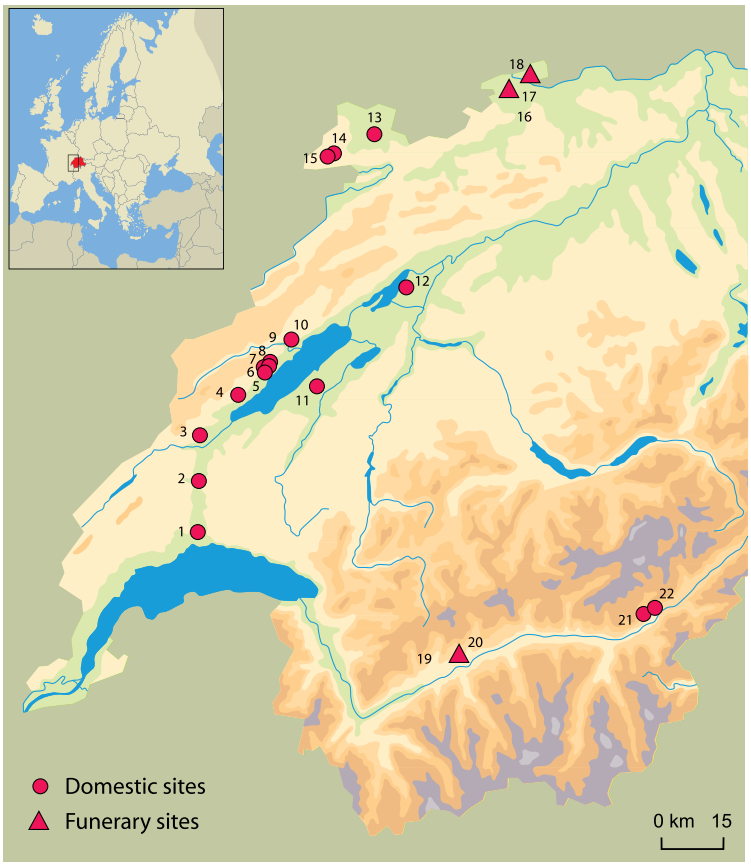


Figure 2. Bell Beaker sites in Western Switzerland (identification numbers refer to appendix B).

Based on archaeological data, the origins of the Bell Beaker complex in Swiss territory may have been the fruit of more or less marked influences from both the southern domain - in the form of ideology - and from the eastern domain - by population migration (Gallay 2006). Different anthropological analyses note a high degree of homogeneity in pre-Bell Beaker populations. By contrast, results for successive population are more mixed, suggesting either population continuity or invoking population renewal (Menk 1979; 1981; Desideri and Eades 2004; Chiaradia *et al.* 2003).

A question, a tool...

Nonmetric dental traits are anatomical variations observed on the permanent and deciduous dentition. They refer, in general, to traits that are present or absent, or that reflect different degrees of devel-

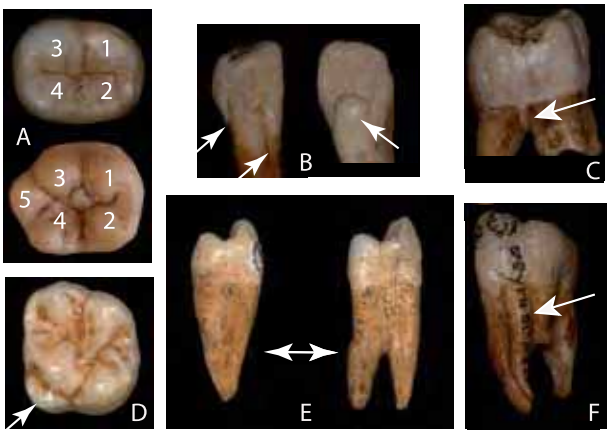


Figure 3. Some examples of nonmetric dental traits observed on permanent dentition: (A) number of cusps on lower molars, top, 4 cusps and bottom, 5 cusps/ (B) left, lateral incisor with two grooves, one medial and one distal; right, lateral incisor with a dental tubercle on the lingual surface / (C) an extension of the enamel is present on the upper molar / (D) occlusal view of an upper molar showing the presence of Carabelli's tubercle / (E) number of roots of the first upper premolar, left, monoradicular; right, biradicular / (F) radix paramoralis present on a first upper molar.

opment (Fig. 3). Dental traits are a valuable tool for understanding relationships between populations (Scott and Turner 1997). On one hand, dentition is one of the most resistant elements of the skeleton, and thus often the best preserved. On the other hand, nonmetric dental traits can be observed on living people, and research on genetic determinism is facilitated by direct analysis of similar subjects or twins. The reference to modern populations finds its significance here. Scientific progress has also contributed to improving understanding of the mechanisms and processes involved in odontogeny.

First, research has established that dental development is highly subject to genetic control (Thesleff and Nieminen 1996; Cobourne and Sharpe 2003). Several studies have demonstrated that the development of the dentition is controlled by a certain number of genes acting in different places and intervening at distinct moments of its formation (Thesleff 2003). While no trait follows a simple mode of inheritance, they are not as complex as those of models of polygenic inheritance in which many genes are involved. In addition, although we cannot deny a probable influence of environmental factors, we also cannot contest the fact that such effects are minor (Tyrell 2000). Finally, studies based on genetic determinism have demonstrated that most of these traits seem to possess a large hereditary component (Scott and Potter 1984; Townsend and Martin 1992).

Next, the viability of the system of observation is an essential element in the validation of data. In effect, the lack of standardization of data can sometimes lead to entirely different results. The subjectivity of observation has often been a determining element in the criticism of the study of dental traits. But at present, it is possible to move past this obstacle, by using dental casts and precise definitions of the different variables, and by eliminating traits that could pose possible problems of standardization by testing not only their own accordance, but also that between different observers. Finally, studies on the value of nonmetric dental traits when applied to modern populations are clearly reassuring (Brewer-Carias *et al.* 1976; Kirverskari 1978; Scott and Dahlberg 1982; Higa *et al.* 2003…). Comparison of results of dental morphology with different estimators, such as geographic proximity, linguistics and genetic data, has reinforced the idea that these variables are good indicators of biological distance between populations.

Today, research on nonmetric dental traits continues and leads to a better understanding of these variables. While some aspects should be better mastered, notably the genes responsible for the development of these variables, to cite only a single example, the genetic determinism underlying the expression of dental traits allows them to be used for comparative studies between populations.

Material

Western Switzerland presents a sequence without major gaps from the 5th to 3rd millennium BC and samples have thus been selected situated chronologically between the Middle Neolithic and the Early Bronze Age. The populations analyzed comprise 520 individuals from eight different sites (Fig. 4 and 5). These sites are primarily located in the western part of Switzerland, although the site of Aesch (n°4) is found in northern Switzerland. Sample sizes range from 10 to 120 individuals. Among the sites, the samples are distributed as follows:

- The Middle Neolithic I includes the sites of Barmaz I (n°1) and II (n°2), Chemin des Collines (n°5) and Avenue Ritz (n°8).
- The Middle Neolithic II includes the sites of Chamblandes (n°3) and Corseaux (n°6).
- The Final Neolithic is present only in the megalithic area of Petit-Chasseur (n°7) in dolmens M6 (during its first occupation phase) and M12.
- The site of Aesch (n°4) and the two dolmens of the cemetery at Petit-Chasseur (n°7) (M6 by re-occupation of the funerary chamber of the Final Neolithic and M11 by building their own monument) are attributed to the Bell Beaker culture.

- The Early Bronze Age includes two samples, the first from the site of Barmaz I (n°1) and the second from several burials at the cemetery at Petit-Chasseur (n°7).

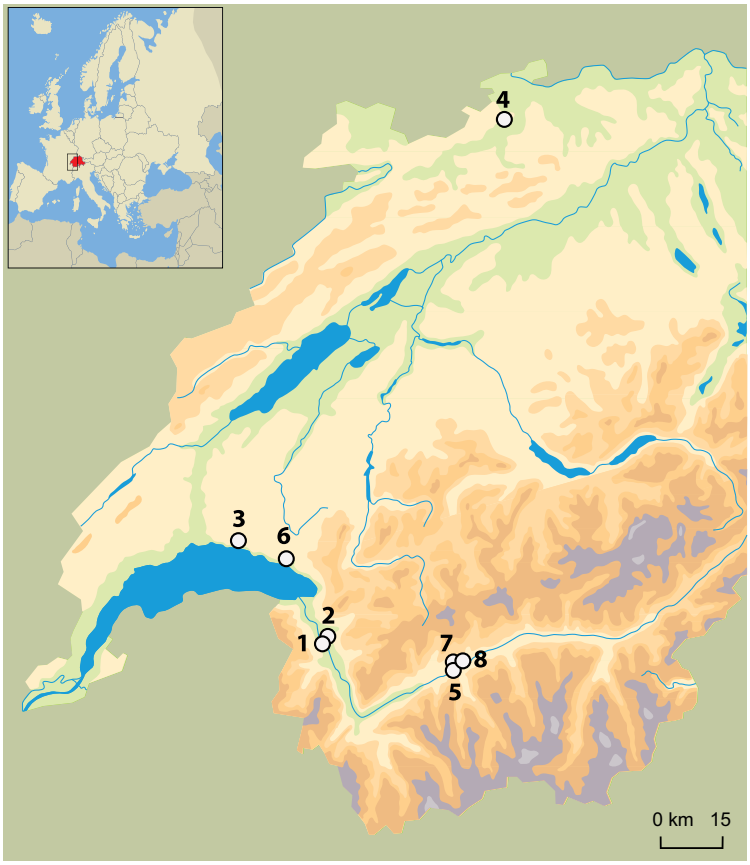


Figure 4. Distribution of sites studied (number of the site on the map, followed by the site name, cultural attribution and, in parentheses, sample size): 1. Barmaz I: Middle Neolithic (51); Early Bronze Age (17), 2. Barmaz II: Middle Neolithic (22), 3. Chamblandes: Middle Neolithic (74), 4. Aesch: Bell Beaker (around 50), 5. Chemin des Collines: Middle Neolithic (24), 6. Corseaux: Middle Neolithic (44), 7. Petit-Chasseur: Late Neolithic (dolmen MVI - around 40 -, dolmen MXII - around 120 -); Bell Beaker (dolmen MVI - 10 -, dolmen MXI - 13 -); mixed Late Neolithic-Bell Beaker: incineration pit (26); Early Bronze Age (15), 8. Avenue Ritz: Middle Neolithic (14).

Early Bronze Age		site number	sample size
VSbz	Valaisian Bronze Age	1, 7	32

Bell Beaker		site number	sample size
AES	Aesch	4	50
PCcam	Petit-Chasseur	7	23

Final Neolithic		site number	sample size
MXII	Petit-Chasseur	7	120
MVIn	Petit-Chasseur	7	40

Middle Neolithic		site number	sample size
SRC	Sion Middle Neolithic	5, 8	38
BAI	Barmaz I	1	51
BAII	Barmaz II	2	22
CHA	Chamblandes	3	74
COR	Corseaux	6	44

Figure 5. Composition of the groups analyzed. The first column represents the code used for each group. The second column indicates either the location of the samples forming a group or the name of a site. The third presents the number of sites included in the group (identification numbers refers to figure 4) and the last column the group size.

Methods

49 binary or graduated dental traits, listed in appendix C, representing 340 possible observations per individual, were recorded using the ASU-DAS system (Arizona State University Dental Anthropology System) (Turner *et al.* 1991) and the FU-DTS system (Freiburg University Dental Trait System) (Alt 1997). Some changes have been made in the scales of certain traits proposed by the different recording systems. Three kinds of changes have been made: the merging of two variables, a simplification of the recording and a reorganization of the scale of expression. Two variables were merged. The first merged trait is *congenital absence* (*congenital absence* and the size reduction of the *peg-shaped tooth form* of incisors and molars). The second variable is the *molar root number (*including *pyramidalism* - root in the form of a single cone - in the first expression of the number of roots for molars). We have opted for a simplified recording of presence/absence for two variables - *mid trigonid crest* and *tuberculum Citroen*. For *winging* of the upper central incisors, the ASU-DAS system applies a scale of four phases based on their position. Two sub-phases are present for bilateral rotation - mesio-

lingually rotated incisors - (phase 1A: angle > 20° and 1B: angle < 20°). This has been simplified by merging the two phases for bilateral rotation, retaining only the presence of rotation and ignoring the angle formed by the incisors. The scale of expression has been altered for two traits - *tuberculum dentale* and *metaconulid*. These transformations do not change the definitions proposed by the different recording systems; the expressions of these traits are simply continuously numbered, without the addition of subdivisions. The remaining traits selected have been recorded in conformity with the definitions established by the different systems and authors.

We measured the accordance between the determination of teeth and the observations of nonmetric dental traits. Evaluation of the accordance of determination of the dentition was carried out. We were able to show evidence for different kinds of errors (notation, lateralization, interarcade, interdistrict and interdentition). Disagreements were not common. The most typical error was that of incorrect identification of the number attributed during excavation; teeth with this type of error were eliminated. Evaluation of the accordance of modes of observation of nonmetric dental traits yielded interesting results. Intra-observer results indicate that differences in gradations between recording sessions are minimal and thus negligible. By contrast, differences between observers were slightly more significant and confirm the difficulty of using data that have not been directly collected by the researcher.

A preliminary treatment of data was done. In an initial phase of refining the data, traits that were never observed, that had a constant expression, or were extremely rare were eliminated. Next, bilateral expression was treated. Among the different methods used, two were retained: the *lateral count method* (the left arbitrarily selected here) and the *individual count method* developed by Scott (1977). The samples were treated according to the specificity of the sites: *individual count* for sites permitting individualization of the subjects (individual burials from the Eastern domain) and *lateral count* for those with mostly isolated teeth (collective burials from the southern domain and Switzerland). Relationships between variables (intertrait, intra- and interdistrict correlations) were measured and sexual dimorphism was tested. One tooth (*key tooth*) by morphological class was retained, corresponding to teeth defined by the ASU-DAS system as the most significant for interpopulational analyses (Turner *et al.* 1991; Scott and Turner 1997). After this preliminary treatment, 30 dental traits were retained for analysis. Frequencies were calculated by applying the *expression count method* developed by Turner (1985) which obtains an adjusted frequency taking into account all of the information provided by the gradations. This was carried

out in two steps: obtainment of a unique frequency followed by the introduction of a correction factor taking into account the sample size. The adjusted frequencies are listed in Appendix D.

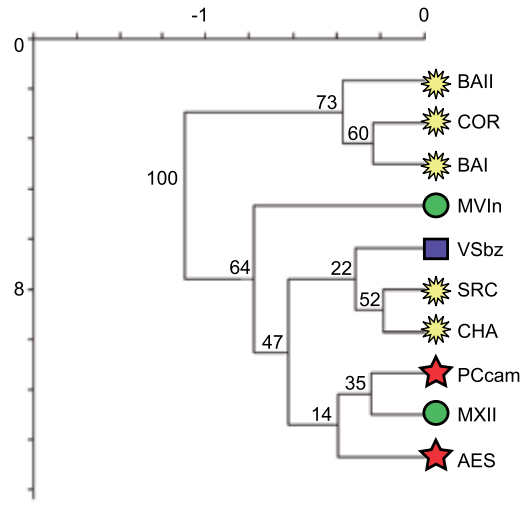
The analytical phase includes the integration of two complementary multivariate methods. Hierarchical cluster analysis - Ward method - was retained and the results are presented as dendrograms. This was complemented by the bootstrap analysis developed by Efron (1979). This is a method of resampling that consists in weighting the traits randomly, in the aim of evaluating the robustness of a tree in the form of percentages (Darlu and Tassy 1993). Next, multidimensional scaling (MDS) was done. These results are presented as scatter plots. MDS was complemented by a minimal spanning tree (MST) to determine the direction of relationships between groups. All analyses were carried out using PAST (PAlaeontological STatistics, version 1.67) (Hammer and Harper 2005).

Results

Hierarchical cluster analysis, complemented by bootstrap analysis, presents two clear groups in which it is possible to identify three subgroups (Figure 6a). The first group includes only Middle Neolithic populations: the two necropolises of Barmaz (BAI and BAII) and the site of Corseaux (COR). The second includes Middle Neolithic samples for the Sion region (SRC) and the late assemblage of the Valaisian Early Bronze Age (BSbz). The latter combines Bell Beaker assemblages (AES and PCcam) and one of the Late Neolithic two dolmens (MXII). Dolmen MVI, dating to the Late Neolithic, is associated with the last two assemblages (the group combining the Middle Neolithic and the Early Bronze Age and the group with recent populations) while maintaining a certain distance.

We find the same configuration in the representation resulting from multidimensional scaling and a minimal spanning tree (Figure 6b). The scatter of points shows a similar pattern, with a clear cohesion for Middle Neolithic populations and more dispersed groups for the more recent periods.

Figure 6. Results of multivariate analyses. The groups belonging to the Middle Neolithic are indicated by yellow stars, Late Neolithic by green circles, Bell Beaker by red stars and Early Bronze Age by purple squares. a) Hierarchical ascendant analysis, based on Ward's method, complemented by bootstrap analysis. b) Multidimensional scaling complemented by a minimal spanning tree (stress=0.08484). c) Principal components analysis (axis 1=50.9% and axis 2=14.9%).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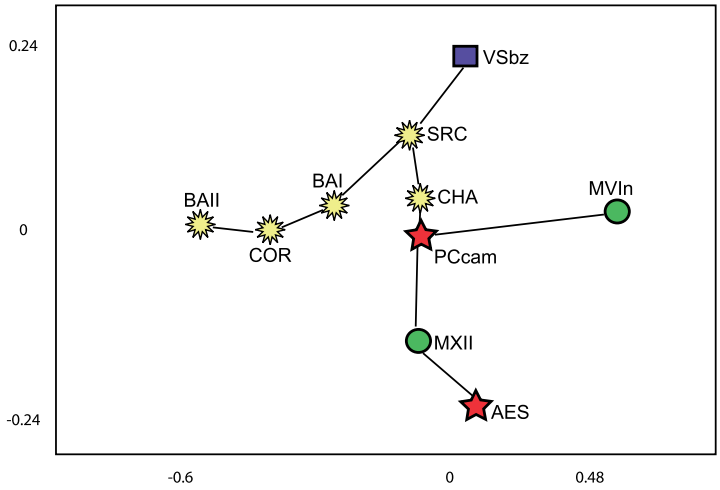
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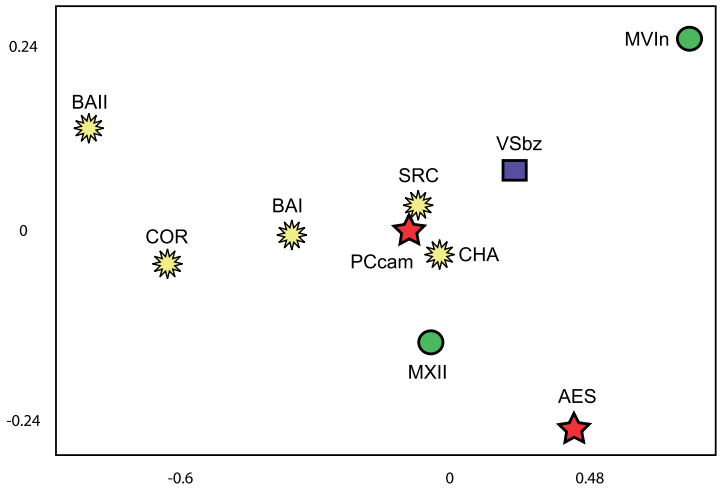
- b -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- c -

Principal components analysis reproduces the elements demonstrated by the other analyses. The representation again shows the grouping of Middle Neolithic assemblages and the more distant positions of the Bell Beaker (AES and PCcam), the Late Neolithic (MXII and MVI) and the Early Bronze Age (VSbz) (Figure 6c).

What do these results mean? The different analyses are in agreement to support the idea of a clear cohesion of Middle Neolithic population in Switzerland and a certain degree of variability in later assemblages, likely reflecting mobility or a moderate population contribution during these different periods.

Discussion

The configurations proposed by the analyses expose a clear view of the relationships between the different populations at the end of the Swiss Neolithic. For the dental data:

- Pre-Bell Beaker groups reveal different behaviors. Middle Neolithic populations form a uniform core. By contrast, Late Neolithic assemblages show greater variability.
- For the Bell Beaker, a degree of heterogeneity in the two assemblages included in the analyses is demonstrated.
- The Late Neolithic base is involved in the emergence of the Bell Beaker complex, but does not appear to be the only actor.
- The Bell Beaker complex, however, does not appear to be involved in the establishment of the Early Bronze Age. In effect, these two cultures are distinct in all of the configurations.

Data from dental anthropology support partial population renewal at the end of the Neolithic. Variability in these late assemblages suggests mobility or a moderate population contribution during these different periods. For the Early Bronze Age, the situation is not as evident. It does appear, however, to be more similar to the Middle Neolithic base than to later periods. It should be noted that there is a documentary gap of several centuries between the end of the Neolithic and the beginning of the Bronze Age in this region. Recall, if need be, that the cohesion of the Middle Neolithic populations in Swiss territory appears to be certain.

The cultural and biological components enable clarification of not only the relationship of the Bell Beaker with preceding local populations, but also the contribution of external influences.

The pottery marks a relatively clear break in which the Final Neolithic pottery is replaced by decorated beakers and new forms (Besse 2003; 2004). Copper artifacts are common in the Final Neolithic, while research to date on the Bell Beaker complex has yielded only two artifacts and the difference is quantitative (Cattin

2008). Explanations for this incontestable difference - the abundance of copper artifacts in the Final Neolithic and near-absence in the Bell Beaker - remain to be determined. Examining the lithic industry, the period 2800–2200 BC demonstrates several breaks in comparison to the preceding period, whether in lithic raw material procurement, blank production or tools in general (Furestier 2007).

We have also seen that the Bell Beaker people reused not only the funerary spaces of their predecessors, but also some of their monuments. In contrast, while the Final Neolithic is marked by a strong littoral occupation in the Three-Lakes region and around Lake Leman, the beginning of the Bell Beaker period is marked by the abandonment of lake margin sites. This abandonment does not appear to be correlated with climate change which would have forced the Bell Beakers to move to a different environment, but rather a deliberate choice to occupy other geographic zones for reasons as yet unexplained. Different territorial boundaries with respect to Final Neolithic populations are difficult to explain, given the reuse of their funerary complexes. According to Pétrequin *et al.* (2005), it is possible that such abandonment of lake margins is due to exhaustion of the soil and forests, which has been proposed for the Final Neolithic.

The composite behaviors of the cultural components result from varying influences. Mediterranean influences are significantly perceptive in the presence of maritime beakers *sensu stricto*, large blades of non-local flint and in funerary ritual, *i.e.*, the reoccupation of dolmens. Eastern influences are demonstrated by the decorations and forms of common ware pottery, such as the handled pitcher, concave-base arrow points, individual graves and by certain kinds of jewelry of gold or silver (Besse 1998). The delocalization of settlements, marked by a deliberate choice made by a group of people to be identified as different from Final Neolithic groups, is also observed in the eastern domain, not only for settlements, but also in burial practices.

Conclusion

Emphasis was placed in this contribution on dental anthropology and on a region in which the expression of the Bell Beaker is all the more interesting for the varieties of its components: Western Switzerland. The objective was to determine, by the analysis of non-metric dental traits, whether the emergence of the Bell Beaker coincided or not with population renewal. The results provided by dental morphology were discussed and compared with other components.

First, we saw that dental nonmetrics results support the idea of a certain harmony in Middle Neolithic populations and mobility or a moderate population contribution beginning in the Final Neolithic and continuing more intensely during the Bell Beaker period. Then, we mentioned that the composite behaviors of the cultural components result from varying influences. The Bell Beaker cultural components influences are from both the South and the East. This is why, in Western Switzerland, the Bell Beaker complex does not evidence a real break with preceding periods, but rather an accentuation in changes linked to external influences that are the result of a contribution both populational and ideological. The Bell Beaker period is thus a privileged moment for contacts held with Europe, both southern and eastern, that generated a composite cultural group in Western Switzerland.

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Appendix A

Final Neolithic sites in Western Switzerland, identification numbers are those represented on figure 1 (A=Auvernier, A-C= Auvernier-Cordé, L= Lüscherz, VFN= Valaisian Final Neolithic).

N°	site name	site type	cultural group	stratigraphy	dendrochronology dating	radiocarbon dating BP	radiocarbon dating calibrated (2 sigma)	bibliography
1	Satigny-Crédery, Satigny (GE)	ground settlement	undefined	sector 1, FA37		Ua33326 = 4085 +/- 35	2870-2490	Besse et al. 2007
2	Genève, Les Pâquis A (GE)	lake dwelling ?	undefined					Pugin & Corboud 2006
3	Genève, Eaux-Vives (GE)	lake dwelling ?	undefined					Pugin & Corboud 2006
4	Genève, La Grange (GE)	lake dwelling ?	undefined					Pugin & Corboud 2006
5	Genève, Parc La Grange (GE)	lake dwelling	L		2947/2899; 2830/2792			Pugin & Corboud 2006
6	Cologny, La Belotte (GE)	lake dwelling ?	undefined					Pugin & Corboud 2006
7	Collonge-Bellerive, Bellerive II (GE)	lake dwelling ?	undefined					Pugin & Corboud 2006
8	Corsier, Corsier-Port (GE)	lake dwelling ?	undefined					Pugin & Corboud 2006
9	Anières, Bassy (GE)	lake dwelling	undefined		2789-2734			Pugin & Corboud 2006
10	Chens-sur-Léman, Sous-le-Moulin (F)	lake dwelling ?	undefined					Pugin & Corboud 2006
11	Chens-sur-Léman, Tougues (F)	lake dwelling ?	undefined					Pugin & Corboud 2006
12	Chens-sur-Léman, Beauregard I (F)	lake dwelling ?	undefined					Pugin & Corboud 2006
13	Messery, Crozette (F)	lake dwelling ?	undefined					Pugin & Corboud 2006
14	Thonon-les-Bains, Rives I (F)	lake dwelling ?	undefined					Pugin & Corboud 2006
15	Saint-Prex, Fraidaigue I et II (VD)	lake dwelling ?	undefined					Pugin & Corboud 2006
16	Tolochenaz, La Poudrière (VD)	lake dwelling	L		2882/75; 2866/58; 2826/24			Pugin & Corboud 2006
17	Préverenges, Préverenges II (VD)	lake dwelling ?	undefined					Pugin & Corboud 2006
18	Veytaux, Château de Chillon (VD)	lake dwelling ?	L?		2792/91			Pugin & Corboud 2006
19	Collombey-Muraz, Barmaz I (VS)	ground settlement	VFN	layer 3a		ETH11987 = 4310 +/- 85	3350-2600	Baudais & Honegger 1995

N°	site name	site type	cultural group	stratigraphy	dendrochronology dating	radiocarbon dating BP	radiocarbon dating calibrated (2 sigma)	bibliography
19	Collombey-Muraz, Barmaz I (VS)	ground settlement	VNF	layer 3e		ETH13286 = 4115 +/- 60	2880-2490	Baudais & Honegger 1995
19	Collombey-Muraz, Barmaz I (VS)	ground settlement	VNF	layer 3e		ETH13285 = 4035 +/- 60	2900-2350	Baudais & Honegger 1995
20	Sion, Petit-Chasseur I (VS)	collective burials	VNF	layer 58		B3059 = 4390 +/- 100	3400-2750	Baudais et al. 1989-90
20	Sion, Petit-Chasseur I (VS)	collective burials	VNF	MVI, layer 6, pavement		B2479 = 4290 +/- 120	3350-2550	Baudais et al. 1989-90
20	Sion, Petit-Chasseur I (VS)	collective burials	VNF	MVI, layer 6, pavement		B2477 = 4280 +/- 160	3400-2450	Baudais et al. 1989-90
20	Sion, Petit-Chasseur I (VS)	collective burials	VNF	MVI, layer 6, pavement		B2478 = 4110 +/- 90	2890-2460	Baudais et al. 1989-90
20	Sion, Petit-Chasseur I (VS)	collective burials	VNF	MVI, layer 6, pavement		B2480 = 4020 +/- 100	2900-2250	Baudais et al. 1989-90
21	Sion, Petit-Chasseur III (VS)	collective burials	VNF	MXII, n°9		ETH4822 = 4055 +/- 65	2880-2460	Baudais et al. 1989-90
21	Sion, Petit-Chasseur III (VS)	collective burials	VNF	MXII, n°10		ETH4823 = 4285 +/- 65	3100-2670	Baudais et al. 1989-90
22	Sion, La Gillière 1 (VS)	ground settlement	VNF	structure 52		CRG1235 = 3995 +/- 75	2900-2250	Baudais & Honegger 1995
22	Sion, La Gillière 1 (VS)	ground settlement	VNF	structure 37		CRG1233 = 3975 +/- 95	2900-2200	Baudais & Honegger 1995
22	Sion, La Gillière 1 (VS)	ground settlement	VNF	structure 36		ETH9042 = 3920 +/- 65	2580-2200	Baudais & Honegger 1995
23	Sion, La Gillière 2 (VS)	ground settlement	VNF	ditch 217 south		CRG1319 = 3854 +/- 65	2490-2130	Baudais & Honegger 1995
23	Sion, La Gillière 2 (VS)	ground settlement	VNF	ditch 217 A1		CRG1318 = 3749 +/- 57	2350-1970	Baudais & Honegger 1995
24	Sion, Nouvelle-Placette (VS)	ground settlement	VNF	south-east hearth		B4866 = 3940 +/- 40	2570-2290	Baudais et al. 1989-90
25	Sion, Palais du Gouvernement (VS)	ground settlement	undefined	layer 18		UtC8813 = 3972 +/- 26	2580-2450	Antonini & Paccolat 1999
26	Savièse, Château de la Soie (VS)	ground settlement	VNF	pit A29		B6325 = 4426 +/- 30	3330-2920	Baudais & Honegger 1995
27	Bramois, Pranoé (VS)	ground settlement	VNF	pit UT7		UtC 12783 = 3873 +/- 40	2470-2200	Mariéthoz & Moret 2004
27	Bramois, Pranoé (VS)	ground settlement	VNF	post UT15		UtC 12784 = 3791 +/- 39	2410-2040	Mariéthoz & Moret 2004
28	Saint-Léonard, carrière MTA (VS)	burial	undefined			UtC12874 = 3778 +/- 45	2350-2030	Mariéthoz 2004
29	Vercorin, Saint-Boniface (VS)	altitude clearing	VNF	layer 5a		Arc1106 = 4028 +/- 113	2900-2200	Buehler et al. 1994
30	Salgesch, Mörderstein (VS)	ground settlement	VNF	sector A, hearth		UtC13451 = 4310 +/- 45	3090-2870	Mottet & Giozza 2005
31	Evolène, Ouartsé-les-Jouttes (VS)	altitude cave	VNF	lower hearth		B4868 = 4040 +/- 50	2860-2460	Baudais & Honegger 1995
32	Zermatt, Alp Hermettji (VS)	altitude cave	VNF	mid hearth 3c		B4702 = 4160 +/-40	2890-2620	Baudais et al. 1990
32	Zermatt, Alp Hermettji (VS)	altitude cave	VNF	upper hearth 3a		B4703 = 4330 +/-40	3090-2880	Baudais et al. 1990

N°	site name	site type	cultural group	stratigraphy	dendrochronology dating	radiocarbon dating BP	radiocarbon dating calibrated (2 sigma)	bibliography
33	Yverdon, Av. des Sports (VD)	lake dwelling	L		2751-2743			Hafner & Suter 2003
33	Yverdon, Av. des Sports (VD)	lake dwelling	A-C		2736-2462			Hafner & Suter 2003
34	Yverdon, UCAR/La Pépinière (VD)	lake dwelling	L		2937-2812			Hafner & Suter 2003
35	Yvon&, Geilinger 4 (VD)	lake dwelling	A	layer 6/4	2740			Hafner & Suter 2003
35	Yvon&, Geilinger 4 (VD)	lake dwelling	L	layer 6/4	2784-2762			Hafner & Suter 2003
35	Yvon&, Geilinger 4 (VD)	lake dwelling	Late A	layer ?	2498-2456			Hafner & Suter 2003
36	Font, Vers-le-Lac (FR)	lake dwelling	L		2769-2766			Hafner & Suter 2003
37	Delley, Portalban II (FR)	lake dwelling	L	sector A, layer 6/7	2787-2752			Hafner & Suter 2003
37	Delley, Portalban II (FR)	lake dwelling	A-C	sector A, layer 1-5	2747-2504			Hafner & Suter 2003
37	Delley, Portalban II (FR)	lake dwelling	A-C	sector A, layer 1-5	2495-2462			Hafner & Suter 2003
38	Concise, Sous-Colachoz (VD)	lake dwelling	Early L	layer 8 ABC	3013-2831			Burri 2007
38	Concise, Sous-Colachoz (VD)	lake dwelling	Final L	layer 9	2826-2669			Burri 2007
38	Concise, Sous-Colachoz (VD)	lake dwelling	A	layer 10	2652-2440			Burri 2007
39	A, Brise Lames (NE)	lake dwelling	L		2792-2750			Becker et al. 1985
39	A, Brise Lames (NE)	lake dwelling	A		2740-2701			Becker et al. 1985
40	A, La Saunerie (NE)	lake dwelling	L		2784-2753			Hafner & Suter 2003
40	A, La Saunerie (NE)	lake dwelling	A-C		2744-2508			Hafner & Suter 2003
40	A, La Saunerie (NE)	lake dwelling	Late A		2498-2440			Hafner & Suter 2003
41	A, Les Graviers (NE)	lake dwelling	L		2988-2756			Hafner & Suter 2003
41	A, Les Graviers (NE)	lake dwelling	A		2748-2701			Hafner & Suter 2003
42	A, Port (NE)	lake dwelling	L		3002-2976			Hafner & Suter 2003
43	A, Les Ténevières (NE)	lake dwelling	L		2806/2770			Becker et al. 1985
43	A, Les Ténevières (NE)	lake dwelling	A		2750-2701			Becker et al. 1985
44	A, Ruz-Chatruz (NE)	lake dwelling	L		2793-2734			Becker et al. 1985

N°	site name	site type	cultural group	stratigraphy	dendrochronology dating	radiocarbon dating BP	radiocarbon dating calibrated (2 sigma)	bibliography
44	A, Ruz-Chatruz (NE)	lake dwelling	A		2793-2701			Becker et al. 1985
45	A, Tranchée Tram (NE)	lake dwelling	L		2982-2958			Hafner & Suter 2003
45	A, Tranchée Tram (NE)	lake dwelling	A		2705-2701			Hafner & Suter 2003
46	Saint-Blaise, Bain des Dames (NE)	lake dwelling	L	complex C, D	2789-2674			Stöckli et al. 1995
46	Saint-Blaise, Bain des Dames (NE)	lake dwelling	A-C	complex E, F, G	2640-2450			Stöckli et al. 1995
47	Thielle-Wavre, Pont de Thielle (NE)	river dwelling	L		2789-2753			Ramseyer 1989
47	Thielle-Wavre, Pont de Thielle (NE)	river dwelling	L	G16		Lv616 = 4150 +/- 70	2900-2490	Hafner & Suter 2003
47	Thielle-Wavre, Pont de Thielle (NE)	river dwelling	L	stake P50		Lv620 = 4340 +/- 100	3350-2650	Hafner & Suter 2003
47	Thielle-Wavre, Pont de Thielle (NE)	river dwelling	A		2737-2701			Hafner & Suter 2003
48	Montilier, Dorfmatte II (FR)	lake dwelling	A-C/L		2732-2626/25			Wolf & Mauvilly 2004
49	Montilier, Dorfmatte (FR)	lake dwelling	A		2708			Becker et al. 1985
50	Vinelz, Ländti (BE)	lake dwelling	L		2853-2791			Stöckli et al. 1995
51	Vinelz, Str&boden Hafen (BE)	lake dwelling	L		2774-2747			Hafner & Suter 2003
51	Vinelz, Str&boden Hafen (BE)	lake dwelling	A		2737-2701			Hafner & Suter 2003
52	Vinelz, Str&boden NW(BE)	lake dwelling	L	baulks 15,17	3162-2767			Hafner & Suter 2003
52	Vinelz, Str&boden NW(BE)	lake dwelling	A	baulks 14, 15,17	2711-2607			Hafner & Suter 2003
53	L, Aussere Dorfstation (BE)	lake dwelling	L		2979-2752			Hafner & Suter 2003
53	L, Aussere Dorfstation (BE)	lake dwelling	A		2737-2701			Hafner & Suter 2003
54	L, Binggeli (BE)	lake dwelling	L		2884-2842			Hafner & Suter 2003
54	L, Binggeli (BE)	lake dwelling	A		2746/2705			Hafner & Suter 2003
55	L, Fluhstation (BE)	lake dwelling	L		2850/2836			Hafner & Suter 2003
56	L, Innere Dorfstation (BE)	lake dwelling	A		2743/2728			Hafner & Suter 2003
57	L, Kleine Station (BE)	lake dwelling	L		2771-2752			Hafner & Suter 2003
57	L, Kleine Station (BE)	lake dwelling	A		2742-2718			Hafner & Suter 2003
58	Täuffelen-Gerolfingen, Ofeli (BE)	lake dwelling	L		?			Hafner & Suter 2003
58	Täuffelen-Gerolfingen, Ofeli (BE)	lake dwelling	A		2740/2705			Hafner & Suter 2003

N°	site name	site type	cultural group stratigraphy	dendrochronology dating	radiocarbon dating BP	radiocarbon dating calibrated (2 sigma)	bibliography
59	Sutz-Lattrigen, Kleine Station (BE)	lake dwelling	L	2845-2754			Hafner & Suter 2003
60	Sutz-Lattrigen, Neue Station (BE)	lake dwelling	L	2840-2788			Hafner & Suter 2003
61	Sutz-Lattrigen, Rütte (BE)	lake dwelling	L	2779-2752			Hafner & Suter 2003
61	Sutz-Lattrigen, Rütte (BE)	lake dwelling	A	2746-2627			Hafner & Suter 2003
62	Sutz-Lattrigen, Südwest (BE)	lake dwelling	L	2918-2895			Hafner & Suter 2003
63	Nidau, Schlossmatte (BE)	lake dwelling	A	2715			Hafner & Suter 2003
64	Bienne, Vingelz-Hafen (BE)	lake dwelling	L	2825-2768			Hafner & Suter 2003
64	Bienne, Vingelz-Hafen (BE)	lake dwelling	A	2742-2695			Hafner & Suter 2003

Appendix B

Bell Beaker sites in Western Switzerland, identification numbers are those represented on figure 2.

N°	site name	site type	stratigraphy	radiocarbon dating BP	radiocarbon dating calibrated (2 sigma)	bibliography
1	Ech&ens, La Tornallaz (VD)	ground settlement ?				Plumandtaz & Robert Bliss 1992
2	Bavois, En Raillon (VD)	ground settlement	layer 12a	B3395 = 3836 +/- 60	2470-2130	Vital & Voruz 1984
3	Rances, Champ-Vully-Est (VD)	ground settlement	layer 4b1	CRG355 = 3910 +/- 60	2570-2200	Gallay & Baudais 1985
3	Rances, Champ-Vully-Est (VD)	ground settlement	layers 4b1 & 4b2	CRG357 = 3800 +/- 70	2470-2030	Gallay & Baudais 1985
3	Rances, Champ-Vully-Est (VD)	ground settlement	layer 4a1	B3380 = 3750 +/- 80	2500-1950	Gallay & Baudais 1985
3	Rances, Champ-Vully-Est (VD)	ground settlement	layer 4b2	CRG354 = 3700 +/- 85	2450-1800	Gallay & Baudais 1985
4	Onnens, Praz-Berthoud (VD)	ground settlement				Falquet 1999
5	Bevaix, Treytel-A Sugiez (NE)	ground settlement ?				Von Burg 2002
6	Bevaix, Le Bataillard (NE)	ground settlement				Von Burg 2002
7	Bevaix, Le Gr& Pré (NE)	single finds				Von Burg 2002
8	Bevaix, Les Murdines (NE)	single finds				Von Burg 2002
9	Cortaillod, Potat Dessous (NE)	individual burial				Von Burg 2002
10	Cortaillod, Sur les Rochettes (NE)	ground settlement				Von Burg 2002
11	Bussy, Pré de Fond (FR)	ground settlement				Mauvilly & Boisaubert 2005
11	Bussy, Pré de Fond (FR)	ground settlement				Mauvilly & Boisaubert 2005
12	Sutz, Lattrigen Rütte (BE)	single finds				Bill 1976
13	Alle, Noir-Bois (JU)	ground settlement	layer 3d, surf. A	Arc1006 = 3835 +/- 55	2470-2140	Othenin-Girard 1997
13	Alle, Noir-Bois (JU)	ground settlement	layer 3d, surf. A	UZ3570/Eth11120 = 3845 +/- 60	2470-2130	Othenin-Girard 1997
14	Chevenez, La Combe En Vaillard (JU)	ground settlement	structure 1	Ua17838 = 3730 +/- 75	2450-1900	Deslex Sheikh et al. 2006

N°	site name	site type	stratigraphy	radiocarbon dating BP	radiocarbon dating calibrated (2 sigma)	bibliography
15	Chevenez, La Combe Varu (JU)	ground settlement ?				Deslex Sheikh et al. 2006
16	Aesch, Chlus (BL)	collective burial				Stöckli et al. 1995
17	Allschwil, Friedhof (BL)	individual burials				Degen 1976
18	Riehen, Hörnlifriedhof (BL)	individual burial				Bill 1976
19	Sion, Petit-Chasseur I (VS)	collective burials	MVI, layer 5A5MAJ	B3062 = 3980 +/- 60	2850-2250	Baudais et al. 1989-1990
19	Sion, Petit-Chasseur I (VS)	collective burials	layer 5A	B865 = 3920 +/- 60	2570-2200	Baudais et al. 1989-1990
19	Sion, Petit-Chasseur I (VS)	collective burials	MXI, layer 5A52MAJ	B3061 = 3820 +/- 70	2470-2040	Baudais et al. 1989-1990
19	Sion, Petit-Chasseur I (VS)	collective burials	MXI, layer 5A52MAJ	B3064 = 3790 +/- 80	2470-2020	Baudais et al. 1989-1990
20	Ayent, Zampon-Noale (VS)	individual burials				Corboud 1986
21	Naters, Altersheim (VS)	ground settlement	pit UT7	UtC 13954 = 3708 +/- 46	2280-1950	Mariéthoz 2005
22	Bitsch, Massaboden (VS)	ground settlement	pit floor, sondage SD11	UtC 12064 = 3722 +/- 37	2280-1980	Mariéthoz 2003

Appendix C

Nonmetric dental traits observed with mention of teeth recorded, scale and system used (C=canines, I=incisors, M=molars and P=premolars).

Dental trait	Tooth recorded	Scale	Dental system
congenital absence	I^2, P^2, M^3, I_1, P_2, M_3	(0-3)	ASU-DAS (changed)
radical number	all teeth	(1-8)	ASU-DAS
radiculae appendiciformes	I, C, P	(0-1)	FU-DTS
canine root number	C_-	(1-2)	ASU-DAS
premolar root number	P^1, P^2	(1-3)	ASU-DAS
Tomes root	P_1	(0-5)	ASU-DAS
molar root number	M	(1-4)	ASU-DAS (changed)
radix paramolaris	M	(0-1)	FU-DTS
idiopathische radices	M	(0-1)	FU-DTS
radix Carabelli	M^1, M^2, M^3	(0-1)	FU-DTS
radix Citroen	M_1, M_2, M_3	(0-1)	FU-DTS
radix entomolaris	M_1, M_2, M_3	(0-1)	FU-DTS
winging	I^1	(1-4)	ASU-DAS (changed)
labial convexity	I^1, I^2	(0-4)	ASU-DAS
interruption groove	I^1, I^2	(0-1)	ASU-DAS (changed)
akzessorische Höckerchen	I^1, I^2	(0-1)	FU-DTS
cingulum	I^1, I^2	(0-1)	FU-DTS
double-shoveling	I, C, P	(0-1)	FU-DTS
shoveling	I, C, P	(0-7)	ASU-DAS
tuberculum dentale	I^1, I^2, C^-	(0-7)	ASU-DAS (changed)
talon cusp	I^1, I^2, C^-	(0-6)	ASU-DAS
canine distal accessory ridge	C	(0-5)	ASU-DAS
canine mesial ridge	C^-	(0-3)	ASU-DAS
odontome	P	(0-1)	ASU-DAS
accessory cusp	P^1, P^2	(0-1)	ASU-DAS
lingual cusp variations	P_1, P_2	(0-9)	ASU-DAS
enamel extensions	P^1, P^2, M^1, M^2, M^3	(0-3)	ASU-DAS
parastyle	M^1, M^2, M^3	(0-6)	ASU-DAS
Carabelli's trait	M^1, M^2, M^3	(0-7)	ASU-DAS
metacone	M^1, M^2, M^3	(0-6)	ASU-DAS
hypocone	M^1, M^2, M^3	(0-6)	ASU-DAS
metaconule	M^1, M^2, M^3	(0-1)	FU-DTS
distal accessory tubercle	M^1, M^2, M^3	(0-5)	ASU-DAS
mesial paracone tubercle	M^1, M^2, M^3	(0-1)	FU-DTS
mesial accessory tubercle	M^1, M^2, M^3	(0-1)	FU-DTS

Dental trait	Tooth recorded	Scale	Dental system
protoconule	M^1, M^2, M^3	(0-1)	FU-DTS
lingual paracone tubercle	M^1, M^2, M^3	(0-1)	FU-DTS
deflecting wrinkle	M_1	(0-3)	ASU-DAS
anterior fovea	M_1	(0-4)	ASU-DAS
mid trigonid crest	M_1, M_2, M_3	(0-1)	ASU-DAS (changed)
distal trigonid crest	M_1, M_2, M_3	(0-1)	ASU-DAS
cusp number	M_1, M_2, M_3	(4-6)	ASU-DAS
groove pattern	M_1, M_2, M_3	(X/+/Y)	ASU-DAS
protostylid	M_1, M_2, M_3	(0-7)	ASU-DAS
hypoconulid	M_1, M_2, M_3	(0-5)	ASU-DAS
entoconulid	M_1, M_2, M_3	(0-5)	ASU-DAS
metaconulid	M_1, M_2, M_3	(0-5)	ASU-DAS (changed)
tuberculum paracone	M_1, M_2, M_3	(0-1)	FU-DTS
tuberculum Citroen	M_1, M_2, M_3	(0-1)	FU-DTS (changed)

Appendix D

Frequencies (EC - expression count) and counts of the variables retained for analyses for each group tested. The first column indicates the name of the variable, the tooth observed and the gradation recorded.

	SRC		BAI		BAII		CHA		COR		MXII		MVIn		AES		PCcam		VSbz	
	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n
Upper teeth																				
congenital absence M3	,05	15	,03	14	,12	14	,01	15	,02	19	,01	46	,00	16	,00	10	,00	7	,10	13
congenital absence I2	,04	13	,00	31	,03	18	,01	27	,01	28	,01	60	,00	23	,00	16	,00	7	,01	14
radical number M1	,16	12	,23	21	,32	13	,18	27	,28	25	,20	49	,10	7	,16	16	,17	9	,13	8
radical number P1	,14	14	,15	21	,23	13	,14	26	,15	26	,16	48	,15	12	,09	9	,15	8	,13	10
radical number C	,01	11	,07	23	,05	14	,05	29	,01	24	,05	44	,03	17	,03	13	,07	8	,06	12
radical number I1	,00	13	,02	19	,05	15	,00	26	,02	26	,01	47	,00	25	,00	7	,00	8	,00	9
premolar root number P1	,05	14	,10	20	,11	13	,11	24	,07	26	,06	46	,08	12	,04	9	,11	9	,03	8
molar root number M1	,32	12	,45	24	,57	13	,36	28	,57	25	,41	49	,16	7	,30	15	,37	9	,41	13
labial convexity I1	,14	14	,14	26	,16	14	,06	25	,16	26	,08	53	,14	26	,05	9	,07	5	,05	7
interruption groove I1	,05	11	,04	25	,05	14	,01	23	,00	23	,06	52	,07	26	,02	8	,04	5	,03	6
cingulum I1	,03	12	,20	25	,27	16	,04	22	,11	26	,09	50	,33	25	,02	7	,09	6	,12	7
talon cusp C	,00	16	,02	19	,00	10	,00	30	,00	22	,00	49	,00	21	,00	11	,00	6	,00	6
shoveling I2	,14	9	,17	25	,18	12	,11	24	,15	19	,16	56	,11	15	,03	7	,09	5	,13	8
tuberculum dentale C	,03	16	,06	20	,12	14	,03	30	,06	19	,05	48	,09	21	,05	13	,03	6	,03	7
double-shoveling P1	,02	12	,01	19	,03	16	,00	10	,00	18	,00	39	,00	11	,00	8	,00	5	,02	8
double-shoveling C	,00	16	,03	24	,11	15	,00	30	,00	25	,00	46	,01	21	,00	11	,00	6	,00	14
double-shoveling I1	,00	12	,00	25	,00	11	,00	26	,00	26	,00	55	,03	25	,01	9	,00	6	,00	7
canine distal acc. ridge C	,04	10	,08	15	,06	8	,05	25	,06	17	,05	36	,09	15	,00	7	,04	5	,05	5
enamel extensions M1	,00	15	,03	22	,05	16	,02	29	,01	30	,02	53	,00	8	,03	14	,03	10	,01	12
enamel extensions P1	,00	13	,00	21	,00	16	,00	22	,00	23	,00	49	,00	13	,02	8	,00	8	,00	11
parastyle M1	,01	21	,01	29	,00	16	,01	35	,00	32	,01	56	,00	8	,00	15	,00	10	,00	14
Carabelli's trait M1	,05	18	,08	28	,14	14	,06	31	,07	27	,07	52	,03	7	,10	15	,12	9	,04	6
metacone M1	,46	20	,55	31	,64	15	,43	35	,62	30	,40	55	,18	8	,35	18	,39	10	,36	12
hypocone M1	,47	20	,55	30	,67	15	,42	34	,64	30	,40	55	,18	8	,29	17	,41	10	,33	11
metaconule M1	,05	16	,04	19	,00	7	,01	28	,02	20	,00	46	,03	5	,02	16	,00	6	,00	5
distal acc. tubercle M1	,04	16	,05	27	,06	13	,03	30	,04	21	,04	47	,02	5	,02	15	,00	9	,06	9
protoconule M1	,05	14	,06	20	,05	5	,01	25	,00	16	,02	37	,00	5	,06	13	,00	6	,00	5

	SRC		BAI		BAII		CHA		COR		MXII		MVIn		AES		PCcam		VSbz	
	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n	EC	n
Lower teeth																				
congenital absence M3	,05	13	,03	15	,05	11	,04	20	,02	21	,04	41	,00	17	,00	18	,00	12	,14	12
radical number M1	,17	17	,24	24	,23	15	,12	26	,22	29	,20	74	,20	22	,16	24	,20	14	,15	9
radical number P1	,05	17	,10	20	,02	12	,03	25	,08	36	,05	71	,03	23	,04	17	,04	12	,06	10
radical number C	,13	14	,29	22	,09	13	,16	28	,16	30	,35	62	,20	13	,44	25	,09	9	,19	10
radical number I2	,05	13	,08	26	,09	15	,00	26	,02	32	,20	67	,05	20	,06	25	,09	8	,09	13
radiculae appendicif. I2	,00	13	,00	27	,09	15	,00	26	,02	32	,00	67	,00	20	,00	25	,00	8	,00	13
canine root number C	,00	12	,00	23	,00	12	,01	28	,02	27	,03	54	,05	13	,04	22	,00	8	,00	10
Tomes root	,04	15	,09	21	,04	12	,04	23	,08	35	,05	64	,04	19	,02	16	,08	10	,05	10
molar root number M1	,21	16	,26	27	,34	15	,18	26	,36	31	,31	75	,28	22	,22	22	,33	15	,19	12
radix entomolaris M1	,00	16	,02	26	,00	15	,00	26	,00	31	,00	75	,00	22	,00	22	,00	15	,00	11
shoveling I2	,00	11	,01	27	,03	16	,11	28	,07	32	,16	67	,00	20	,00	25	,01	7	,04	14
double-shoveling I2	,00	11	,00	28	,00	16	,01	29	,00	32	,00	70	,00	20	,00	26	,00	7	,00	15
canine distal acc. ridge C	,01	8	,02	16	,00	8	,05	25	,00	19	,03	55	,01	9	,05	23	,00	8	,02	7
odontome P2	,00	8	,00	12	,00	5	,00	20	,00	19	,00	48	,02	12	,00	17	,00	10	,00	5
lingual cusp variations P2	,08	11	,14	19	,10	9	,12	24	,14	20	,12	48	,08	12	,12	17	,12	11	,04	5
distal trigonid crest M1	,00	22	,02	23	,00	14	,00	34	,00	28	,00	85	,00	20	,00	24	,00	14	,00	8
cusp number M1	,16	22	,20	23	,27	14	,24	34	,23	28	,32	85	,24	20	,24	24	,28	14	,08	8
groove pattern M1	,09	8	,07	17	,05	5	,07	18	,20	19	,10	47	,10	11	,22	21	,09	7	,06	6
protostylid M1	,04	20	,02	25	,08	15	,04	32	,04	27	,04	81	,05	21	,06	25	,04	16	,01	10
hypo-entoconulid M1	,14	22	,21	25	,34	14	,25	33	,24	27	,31	84	,19	19	,28	24	,29	15	,08	9
metaconulid M1	,00	16	,01	29	,00	16	,01	20	,00	27	,00	63	,00	22	,00	18	,00	14	,00	12
tuberculum paracone M1	,03	20	,02	31	,05	17	,00	28	,05	30	,01	47	,00	6	,00	19	,00	15	,00	12

Chapter 5

The Beaker transition in Mediterranean France

Olivier Lemercier

Abstract

In Mediterranean France, the end of the Neolithic is now well-known. Many cultural groups are chronologically and geographically defined (Rhône-Ouvèze, Fontbouisse, Vérazien…) and the origin of the Beakers phenomenon seems clearly foreign in this context. The existence of this cultural variety in the Final Neolithic leads to:

- Differences in the first Beaker settlements in these areas,
- Various types of acculturation, partial or total, of the indigenous groups, with sometimes the survival of certain Late Neolithic traditions,
- The development of two Middle regional Bell Beakers groups (Pyrenean group and Rhodano-Provençal Group) after the first phenomenon.

The beaker pots known on several hundreds of sites make it possible to recognise three broad chronological phases, in French: *Campaniforme Ancien* (Early Bell Beaker), *Campaniforme Récent* (Middle Bell Beaker) and *Campaniforme Tardif* (Late Bell Beaker). In the early phase regional differences appear, with in the Provence a strong Beaker establishment on littoral settlements, and on naturally defended hill-top sites with substantial assemblages. Only rare goblets seem diffused towards the indigenous sites inside the region. In Eastern Languedoc, in the area of the Fontbouisse group, this oldest Beaker phase does not exist and only some pots seem present on indigenous sites. During the 'recent' phase, the development of the Middle regional Beaker groups shows a more or less complete acculturation of the local populations. It is only at this time that the Bell Beaker Culture really develops in Languedoc. These regional

differences affect the development of Early Bronze Age. These observations and the integration of the recent data make it possible to argue about the origin and even the nature of the Beaker phenomenon, and to propose a regional model which could apply to several areas of development of Bell Beakers in Europe.

Keywords

Mediterranean, France, Bell Beakers, Colonisation, Acculturation

Introduction

Mediterranean France, between the Iberian and Italian peninsulas, is a vast coastal front extending from the Alpine massifs in the east to the Pyrenees in the west. It is bordered on the north by a series of smaller massifs (Montagne Noire, Causses, Cévennes and Préalpes). The Aude Valley to the west and the Rhône Valley to the north, as well as the shores at the end of the Pyrenees and the foot of the Alps provide large communication routes with the Mediterranean peninsulas and Europe (Fig. 1).

With respect to the end of the prehistoric period and the transition from the Neolithic to the Bronze Age, several thousand sites are known here. A long history of research over many decades has led to the proposal of broad chronological and cultural frameworks. More recently, the Bell Beaker phenomenon has been the focus of a

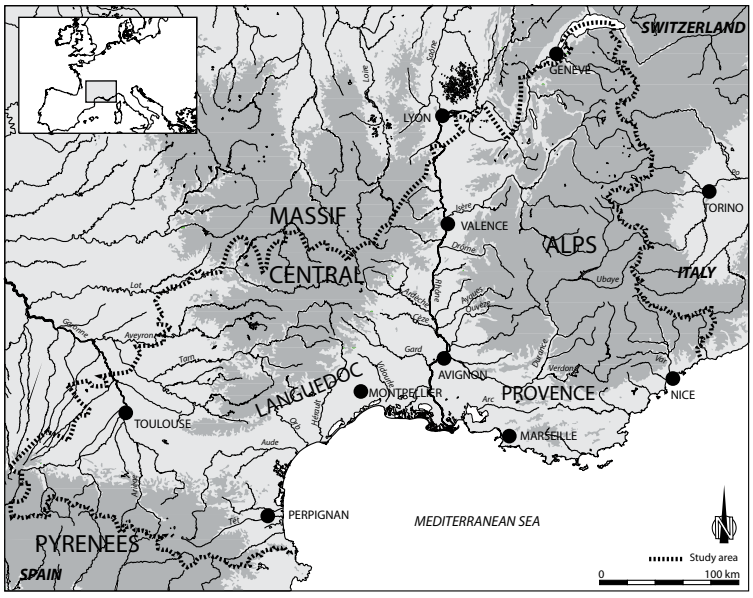


Figure 1. Geographical situation of the study area.

series of particular research projects at a regional scale in France and Western Europe. Several studies have concentrated on decorated Bell Beaker pottery, addressing the technology underlying the decoration motifs (Salanova 2000), fabrics (Convertini 1996; 2009), common ware pottery (Besse 2003) and the lithic industry (Furestier 2007), while a regional synthesis of the data for the southeast has been made by Lemercier (2004*b*). Parallel to that, several studies have focused on the end of the Neolithic in Mediterranean France, particularly in the Languedoc (Guilaine and Escallon 2003; Carozza *et al.* 2005; Coularou *et al.* 2008…) and the Provence. Thematic approaches include ceramics (Cauliez 2009), animal economy (Blaise 2010) and periodisation (Lemercier 2007; Lemercier *et al.* 2010), as well as the transition to and origins of the Bronze Age (Vital 2000; 2001; 2004; 2008; Vital *et al.* in press).

This highly dynamic research now enables, in a better understood chrono-cultural context at the end of the regional Neolithic (Fig. 2), the proposal of several new research directions concerning the establishment and development of the Bell Beaker Culture and the transition from the Neolithic to the Bronze Age.

In Mediterranean France, more than 540 sites (Fig. 3) yielding Bell Beaker artifacts have currently been inventoried (around 170 burials, 230 settlements or domestic sites and 130 sites of unknown function). The high number of settlements in relation to burials provides important information since it indicates that the Bell Beaker Culture is in this region, not simply a "funerary assemblage". This forms a solidly basis to analyse find assemblages and their context with respect to the appearance and development of the Bell Beaker

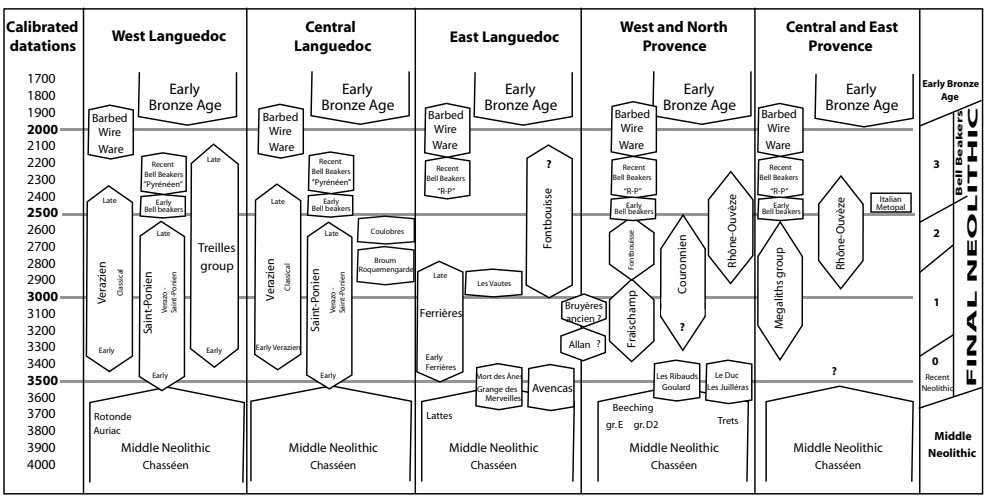


Figure 2. Late Neolithic periodisation in Mediterranean France.

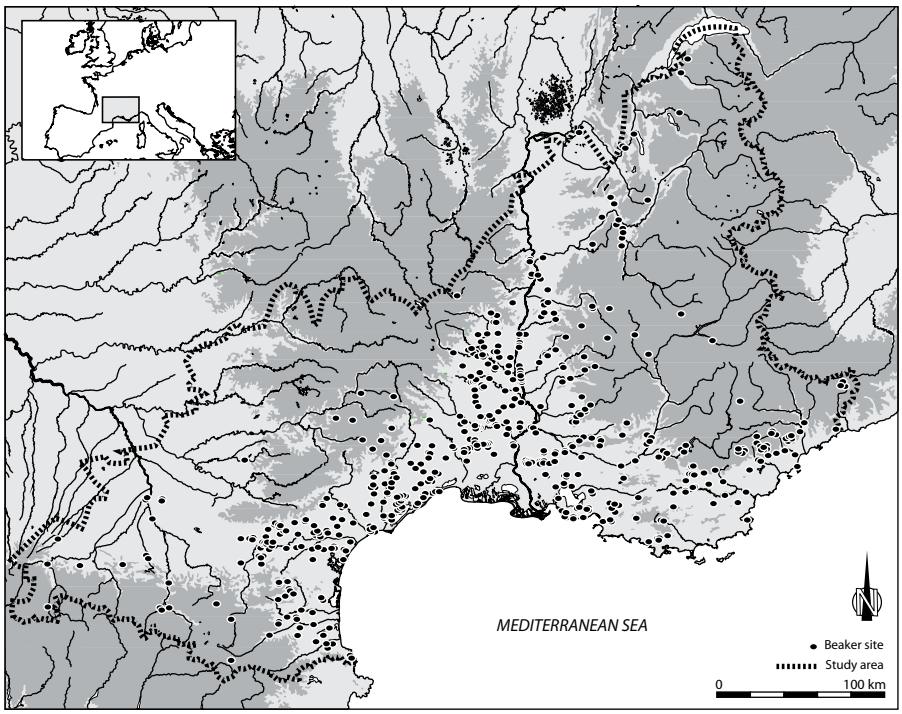


Figure 3. Distribution map of Beaker sites in Mediterranean France.

Culture. This phenomenon remains essentially determined by the presence of a specific type of decorated pottery, but can now in addition be defined on the basis of certain characteristics of common ware pottery, lithic and metal industries and certain types of ornamentation.

In the 1960s four Bell Beaker ceramic styles were defined for certain regions, such as the Pyrenees (Guilaine 1967; 1976) and the Provence (Courtin 1967; 1974), and then extended to cover the entire region. The recent re-examination of the Bell Beaker in southeastern France, the eastern half of Mediterranean France has clarified the position of different styles. Based on the most recent data obtained from more than 310 sites totalling more than 1500 decorated vases (Lemercier 2004*b*) (Fig. 4), a periodisation in three chronological phases has now been proposed: the Early, Middle and Late Bell Beaker phenomenon, cultures and tradition (Lemercier 1998).

The chronological position of the Bell Beaker in the second half of the 3rd millennium BC has been verified by direct and indirect dates. However, this does not contribute enormously to the periodisation for Bell Beaker assemblages The periodisation is based on

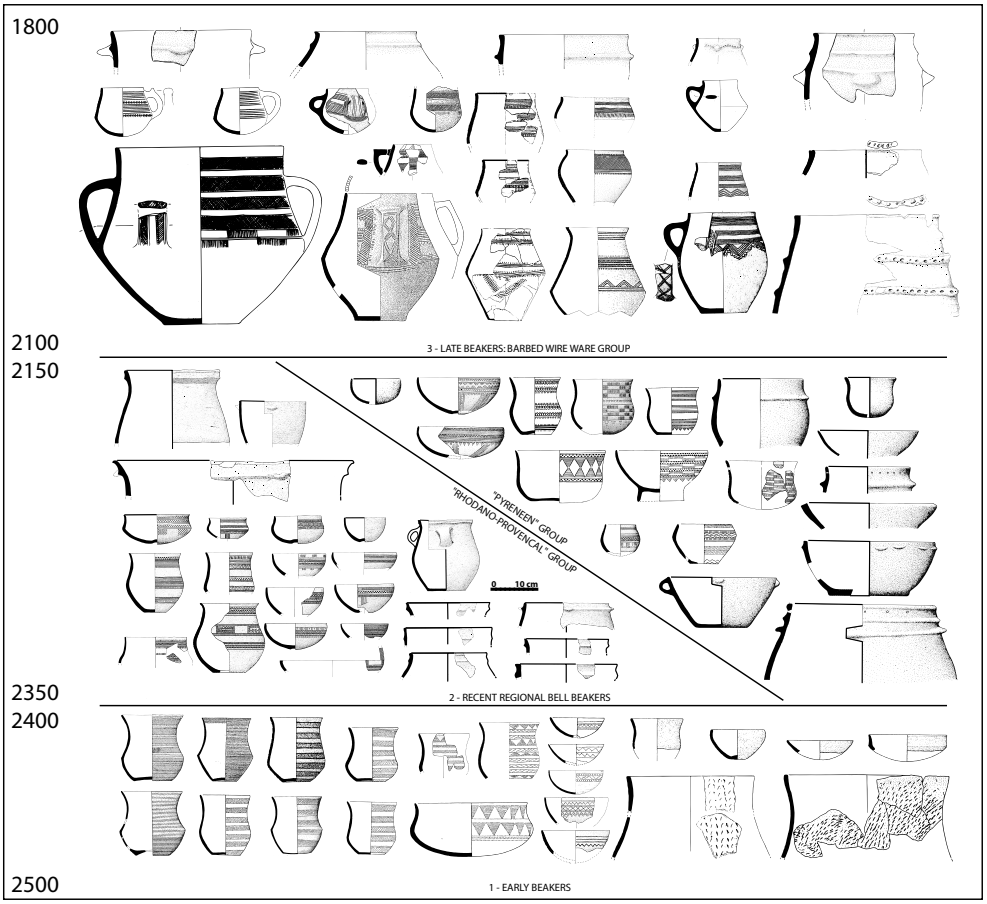


Figure 4. Beaker pottery periodisation in Mediterranean France (drawings after: Bill 1973; Sauzade et al. 1974; Courtin 1976; 1978; Sauzade 1983; Courtin et al. 1985; Guilaine et al. 1989; 2001; Barge-Mahieu 1992; Roudil 1993; Jallot et al. 1996; Vaquer 1998; Vital 2000; Buisson-Catil and Vital 2002; Vignaud 2002; Ambert 2003; Leonini 2003; Lemercier 2004b).

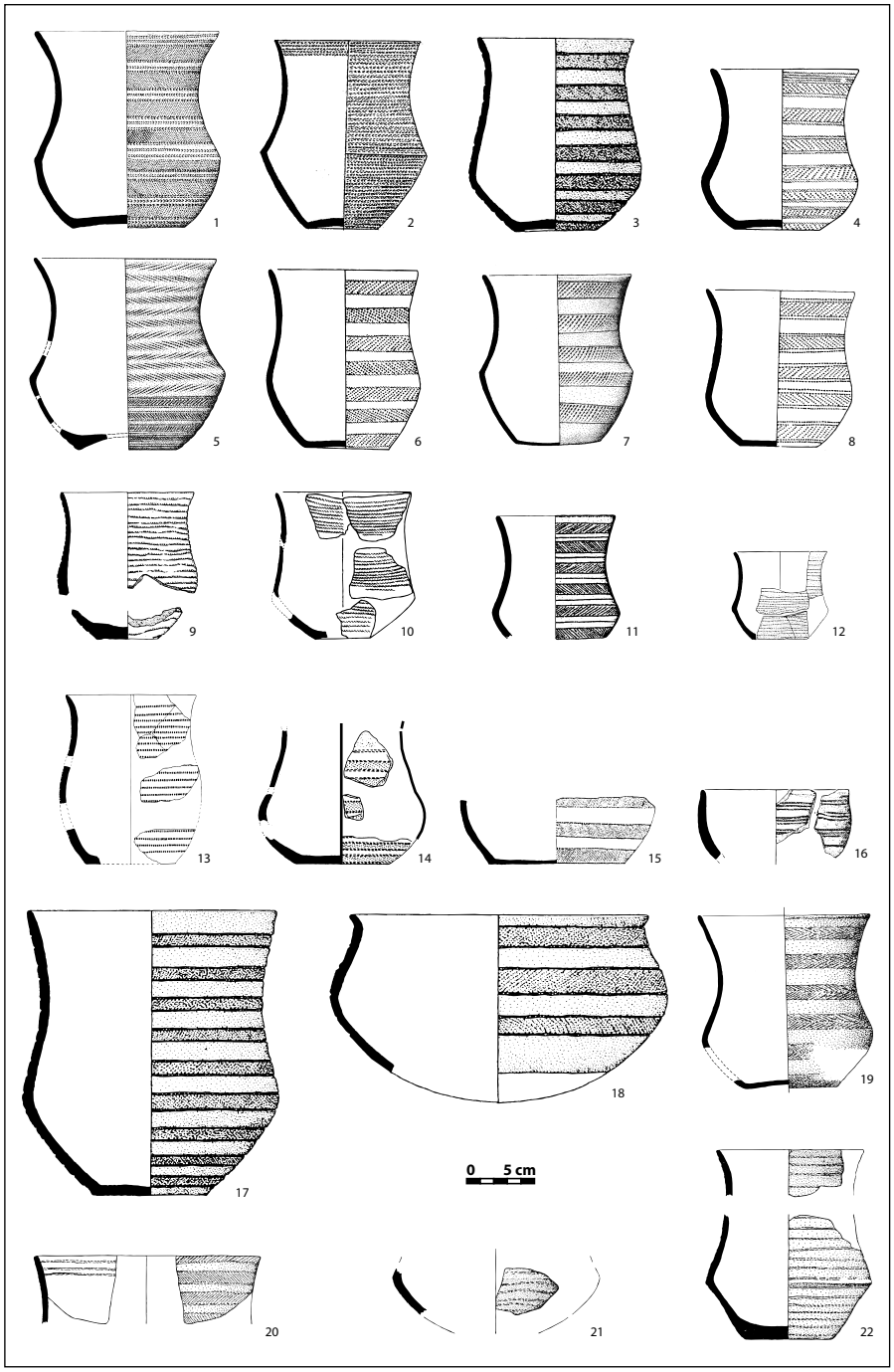
archaeological observations rather than on absolute dates, which are not abundant anyway. Moreover, they have been obtained in the early stage of radiocarbon dating and are weakened by often large standard deviations. In addition they are sometimes completely incoherent and for the first phases in particular, fall within a period that is difficult to calibrate. At present, 45 dates have been published for the Bell Beaker Culture in Mediterranean France, but these are very unequally distributed among the known Bell Beaker styles. While the three groups defined seem to have a chronological value, the range covered by the dates is still unsatisfactory. Only the final period with pottery with barbed wire decoration appears to be well-supported chronologically.

Archaeological observations, in contrast, are abundant and convergent. These are based first on typological analyses which enable observation of changes in decorative styles and ceramic morphologies between phases. They are also based on stratigraphy at many sites, and confirm the succession from Bell Beakers of standard and geometric dotted style to the Rhodano-Provençal Bell Beakers, followed by groups with barbed wire decoration. These sites are in particular Pendimoun rock-shelter (Castellar, Alpes-Maritimes: Binder 2003), Chauve-Souris cave (Donzère, Drôme: Vital 2001) and Vignaud 3 (Langlade, Gard: Hayden *et al.* in press). In addition, the sequence is also confirmed by a increasing number of discoveries of Bell Beaker pottery associated with local cultures of the Final Neolithic while it becomes 'autonomous' in the context of the Rhodano-Provençal group, as did the Pyrenean group (Lemercier 2003*a*). Data for common ware pottery associated with Bell Beaker vessels support this pattern of the association of early Bell Beaker vessels with local common ware pottery, followed by the development of a specifically Bell Beaker common ware pottery with the late Pyrenean and Rhodano-Provençal groups (Lemercier 2004*b*).

The Early Bell Beaker phase (*Campaniforme Ancien*)

The earliest Bell Beakers present in southeastern France correspond to two distinct stylistic groups. One is composed of maritime or international style pottery and its most common variants (Fig. 5). These include beakers with a limited range of decoration. These decorations are dotted (made with a toothed tool: shell or comb) and/or corded. The decorative motifs generally cover the entire vessel, but are fairly unvarying and structured exclusively horizontally. They are composed of linear decorations, bands of lines or hatched bands. Decorated zones may be separated by empty zones. Internal

Figure 5. Early Bell Beaker pottery. 1. Forcalquier – La Fare, 2. Mèze – Puech Badieu, 3. Trèbes – Le Mourral, 4. Bartrès – La Halliade, 5. Cessenon – Aumet, 6. Laroque-de-Fa – Dolmen 8 de la Clape, 7. Mailhac – Boun Marcou, 8. Monze – Dolmen de la Madeleine, 9. Saint-Paul-de-Varces, 10. Mailhac – Grotte de la Treille, 11. Donzère – Baume des Anges, 12. Sanilhac – Baume Saint-Vérédème, 13. Cabris – Dolmen du Coulet de Stramousse, 14. Remoulins – Grotte de la Sartanette, 15. Sainte-Anastasie – Grotte des Frères, 16. Sanilhac – Baume Saint-Vérédème, 17 and 18. Trèbes – Le Mourral; 19. Laroque-de-Fa – Dolmen 5 de la Clape, 20-22. Gorniès – Grotte du Claux. (1 after Lemercier 2004b; 2 after Montjardin et al. 2000; 3, 17, 18 after Vaquer 1998; 4, 6, 8, 10 after Guilaine et al. 2001; 5, 7 after Ambert 2003; 9 after Bill 1973; 11 after Lambert 1976; 12, 16 after Vigneron 1981; 13 after Courtin 1962; 14 after Salanova 2000; 15 after Gutherz and Hugues 1980; 19 after Bocquenet 1993; 20-22 after Roudil 1988).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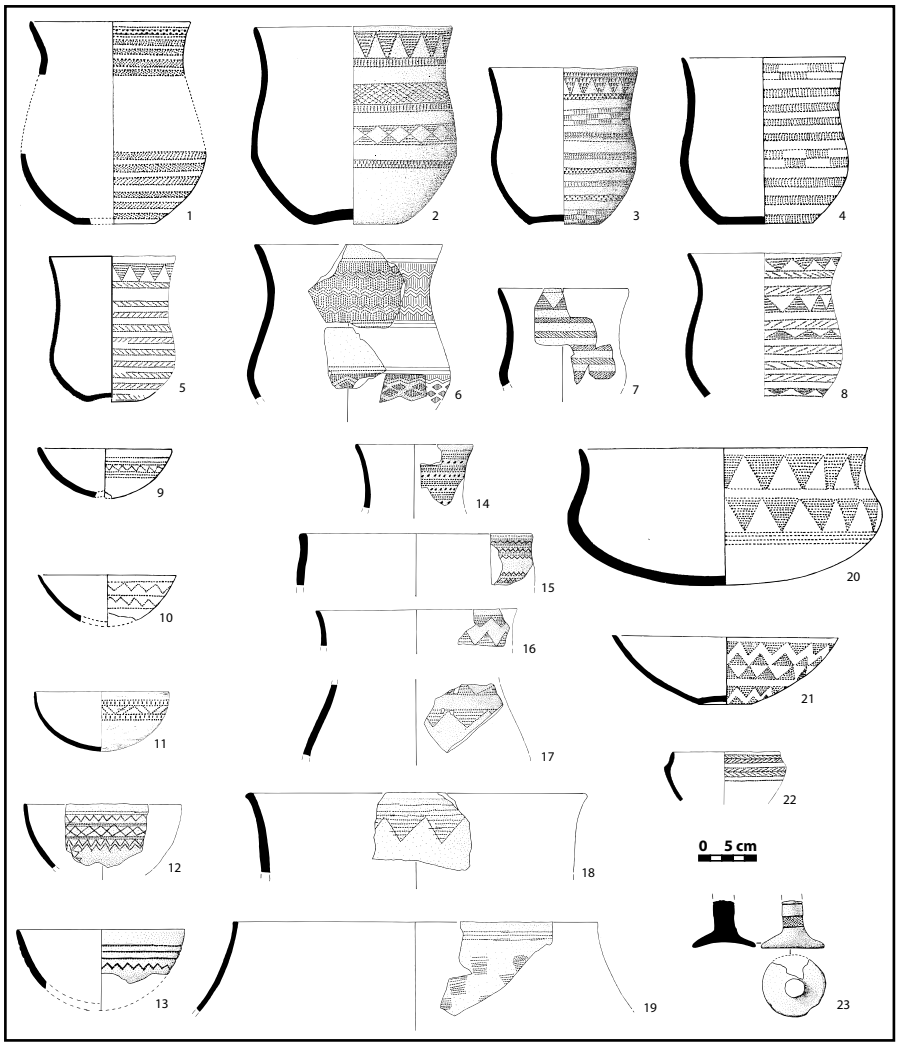

Figure 6: Early Bell Beaker pottery. 1. Mailhac – Dolmen de Boun Marcou, 2 and 3. Saint-Vallier – Tombe 2 de Sainte-Anne, 4. Mons – Grotte de Peygros, 5. Fontvieille – Hypogée du Castellet; 6. Le Plan d'Aups – Tumulus du Gendarme, 7. Avignon – La Balance, 8. Fontaine – Abri de Barne-Bigou, 9 and 10. Avignon – La Balance, 11. Vence – Baume Claire, 12. Avignon – La Balance, 13. Avignon – Place du Palais, 14-19. Simiane – Col Sainte-Anne, 20 and 21. Mailhac – Dolmen de Boun Marcou, 22. Fontvieille – Hypogée du Castellet, 23. Avignon – Place du Palais (1, 4, 9, 10, 20, 21 after Guilaine et al. 2001; 2, 3 after Gassin 1986; 5, 8, 22 after Bill 1973; 6, 11-12, 14-19 after Lemercier 2004b; 13, 23 after Sauzade 1983).

decorations are rare, but present in some cases. The form variety is limited almost exclusively to beakers of different size, the bases are generally flat or concave.

The second group, called "geometric dotted", is based on the same general principles, but shows a wider variety (Fig. 6). This variety is first noted with respect to form, which includes beaker

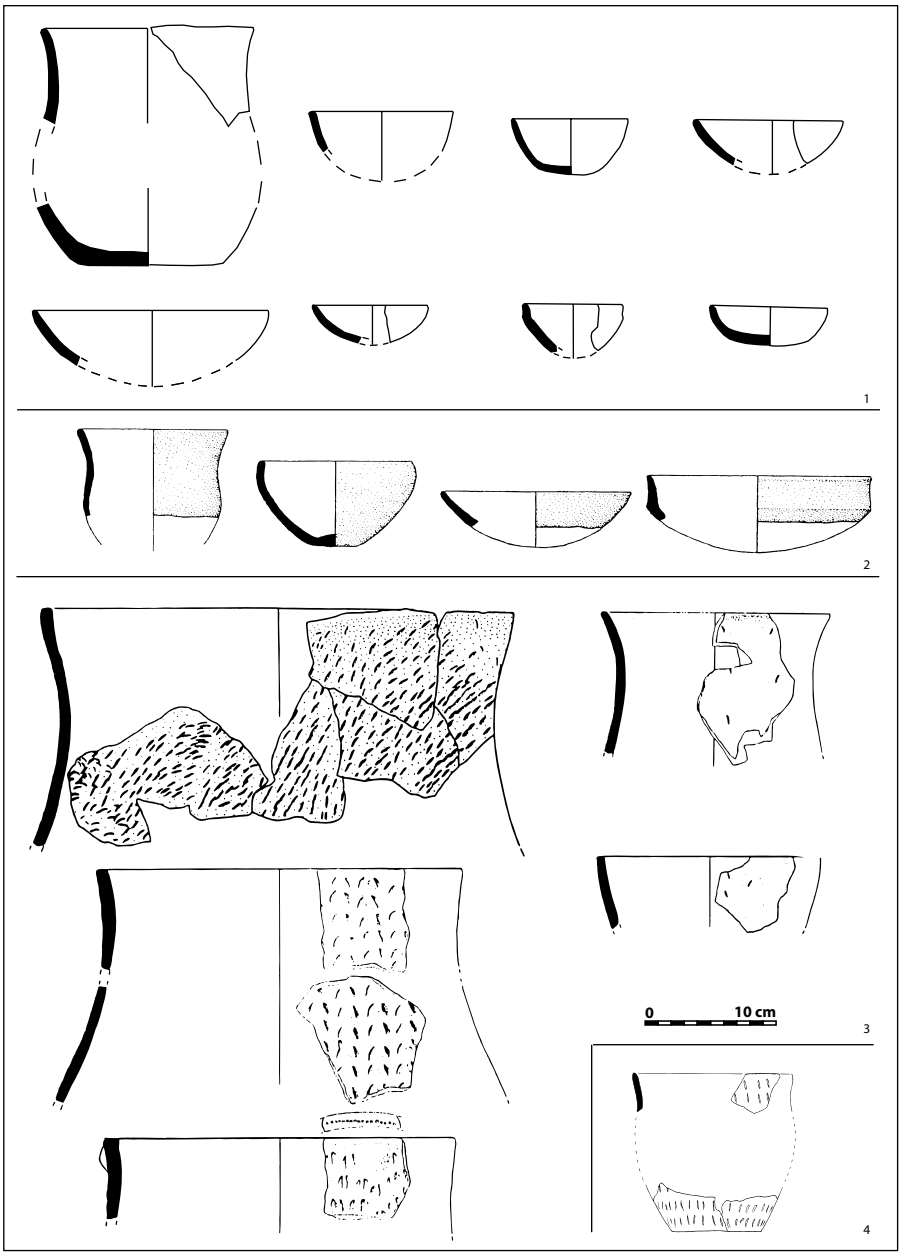

Figure 7. Early Bell Beaker phase : undecorated pottery. 1. Orgon – Les Calades, 2. Trèbes – Le Moural. Fingernail decoration, 3. Orgon – Les Calades, 4. Fontaine – Abri de Barne-Bigou (1 and 3 after Barge-Mahieu 1992; 2 after Vaquer 1998; 4 after Bill 1973).

forms, but also many low forms, such as shallow bowls, deep bowls, basins, cups, *etc.*, generally with flat or concave bases, but also rounded bases. Dotted decorations present more numerous motifs like triangles, lozenges and squares that may be hatched. These are

associated with hatched or linear bands respecting the same general rules for organisation. Noteworthy is the presence of vertical bands converging at the base.

Associated with these decorated ceramics of two early styles are smooth, undecorated vessels with the same range of forms, that is, exclusively beakers, bowls and cups. In combination with the decorated vessels they constitute the fine ware for presentation and consumption (Fig. 7).

A single type of pottery is different and not attributable to a local group, but appears to be associated with the geometric dotted Bell Beaker pottery. These are vessels with fingerprint or fingernail deco-

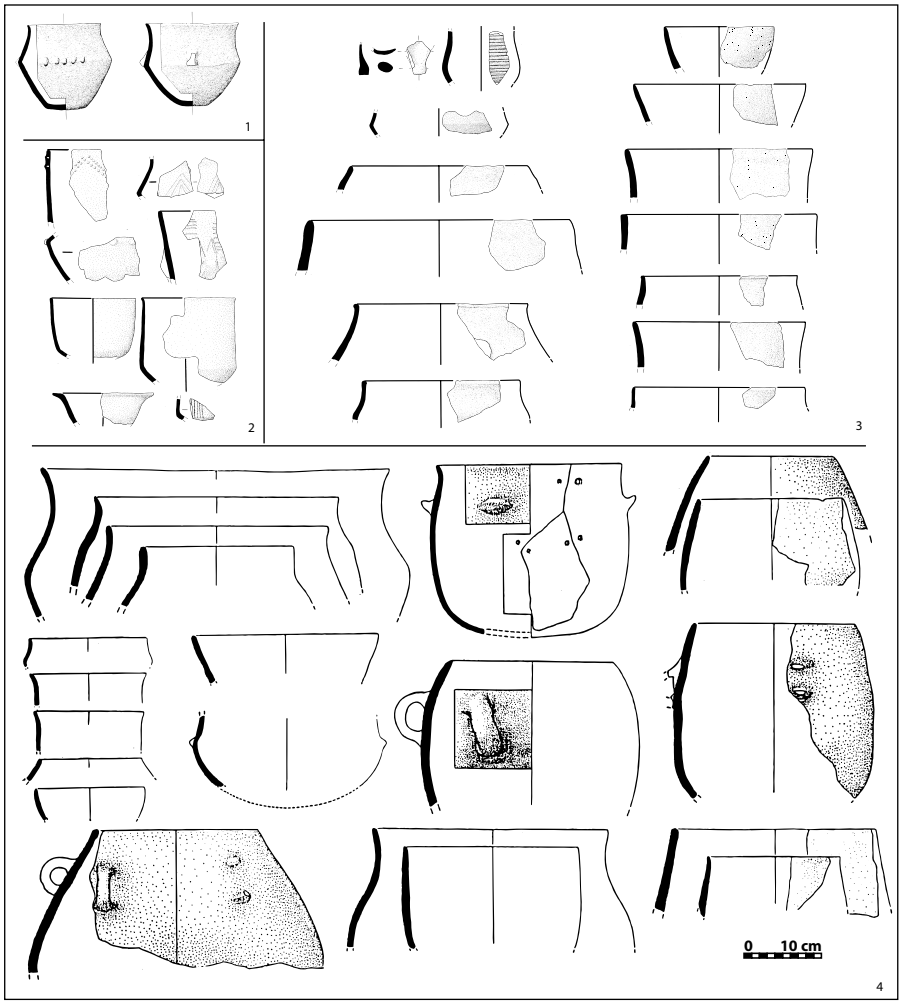

Figure 8. Early Bell Beaker phase: associated local pottery. 1. Forcalquier – La Fare, 2. Les Baux-de-Provence – Escanin 2, 3. Châteauneuf-les-Martigues – Le Fortin du Saut, 4. Orgon – Les Calades (1-3 after Lemercier 2004b; 4 after Barge-Mahieu 1992).

rations placed regularly or randomly on the body (Fig. 7 n°3-4). In Early Bell Beaker assemblages, the remainder of the pottery consists of vessels that are typical for local Final Neolithic cultures (Fig. 8).

The lithic toolkit shows mainly local or nearby raw material procurement and relatively small modules. Production of small irregular flakes with direct hard percussion or on anvil seems to have been the rule. The tools show limited variability (Fig. 9). The proportion of arrowheads can be significant (leaf shaped and irregular cordiform, lanceolate, and tanged and barbed specimen with a squared barbed variant). The other tools include end-scrapers, splintered pieces and

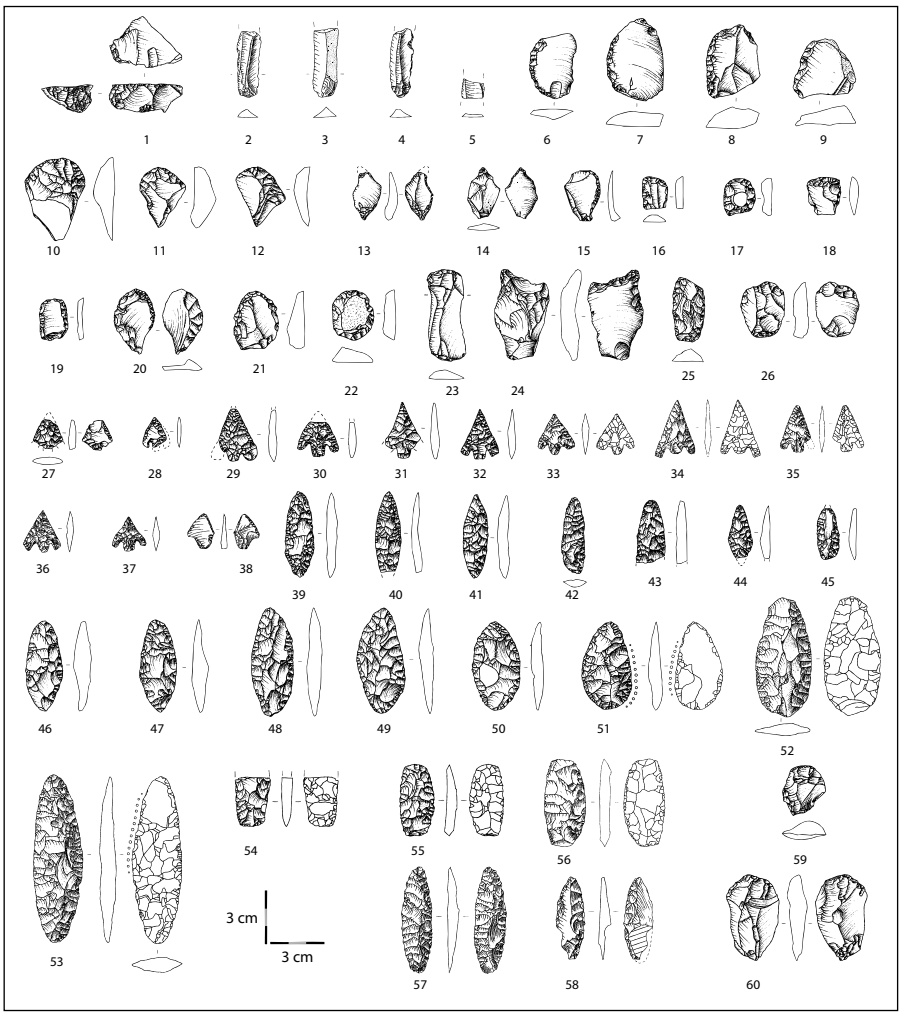

Figure 9. Early Bell Beaker lithic industry. 1: core, 2-5: blades; 6-9: side scrapers; 10-12, 15-23: scrapers; 13, 14, 24: borers; 25: double side scraper; 26, 59, 60: splintered pieces; 27-58: arrowheads. 1, 6-32, 39-53, 59, 60: Orgon – Les Calades; 2-5, 33-38, 54-58: Châteauneuf-les-Martigues – Le Fortin du Saut. (after Furestier 2007).

side-scrapers. This flint industry is relatively well-distinguished from those of local groups at the end of the Neolithic, although they have some elements in common (Furestier 2007; 2008).

Tools made of polished stone and hard animal material are present, but are not very common. They do not significantly differ from those in the other cultures at the end of the regional Neolithic. Metal objects are rare, particularly considering their abundance in regional contexts of the Fontbouisse group in eastern Languedoc. In reliable contexts, these are primarily small objects such as square-sectioned awls and various kinds of daggers. Pseudo-Palmela points, known also in the French Midi, can be associated with the early Bell Beakers. Funerary contexts are mainly collective and built and used in the centuries preceding the Bell Beaker phenomenon. This insecure context does not allow us to distinguish which types of ornamentation were associated to this initial phase of the Bell Beaker. Neither are bracers from this phase found in reliable contexts (generally in dolmens).

The early Bell Beaker groups are represented by two different kinds of assemblages.

Most often these are isolated vessels, or in groups of two or three. They come from unspecified domestic contexts attributed to the local Final Neolithic, or more generally from caves or funerary monuments for which the long duration of use and significant reworking prevent clarification of the relationship of the Bell Beaker elements with the other deposits. The existence of strictly self-contained assemblages has been shown by the excavation of burial S14 at Forcalquier – La Fare in the Alpes-de-Haute-Provence, associating a vessel with mixed decoration (comb and cord) and two beakers from the Rhône-Ouvèze group (Lemercier *et al.* 2011). Some sites, however, have very different assemblages. These are Bell Beaker find complexes with a much larger number of decorated vessels, associated with assemblages attributable to the Rhône-Ouvèze or the Fontbouisse group. In these assemblages, decorative elements, metal objects and probably part of the lithic toolkit come from a tradition differing from those of local groups. They reflect a real synchrony and are not the result of reworking, as is demonstrated by the fact that "pure" early Bell Beaker sites do not exist, as well as evidencing stylistic and technological transfers between Bell Beaker and local traditions.

Moreover, observation of the ceramic stock at these sites shows that the decorated and undecorated Bell Beaker pottery represents only the fine pottery in these assemblages, in which the common ware pottery is systematically composed of types belonging to local Final Neolithic cultures.

The geographic distribution (Fig. 10) of sites with large assemblages is fairly specific. They are situated in the Mediterranean littoral zone as well as at the mouths and along the principal rivers and their tributaries or along the main circulation routes at the foot of the massifs. This initial series of occupations excludes the inland regions or borders, but isolated Bell Beaker artifacts have been found (one or more vessels generally in funerary contexts). The first Bell Beaker settlements also show a noteworthy topography: small terraces on cliff edges, rocky ridges or rocky peaks protected by sheer drops on all sides. The surface area of these sites is generally quite limited: Châteauneuf-Les-Martigues – Fortin du Saut (Furestier *et al.* 2007), Simiane-Collongue – Col Sainte-Anne (Bocquenet *et al.* 1998), Orgon – Les Calades (Barge-Mahieu 1989). These are typically only a few hundred square meters, sometimes less, yielding material from one to four housing units, sometimes associated with annexes. The houses are oval in form and less than 60 m² in area. A small dry stone peripheral wall, the use of natural rock to support the structures and a row of post holes along the main axis of the construction, corresponding to a ridge beam, define the architecture (Lemercier and Gilabert 2009).

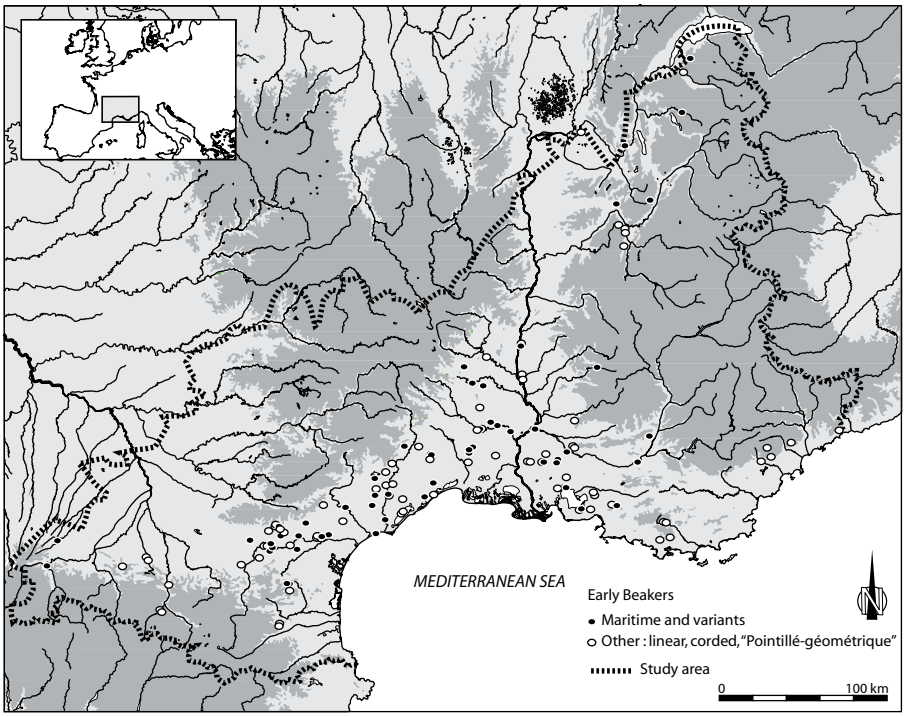

Figure 10. Distribution map of Early Bell Beaker sites in Mediterranean France.

The rare economic data enable nonetheless to consider these initial Bell Beaker settlements as domestic sites in the Neolithic agro-pastoral tradition. Cereal remains are present, as well as grinding material. The animal economy was recently studied for two sites in this phase (Blaise 2010). This shows that the role of hunting is somewhat more important and diversified in comparison to Final Neolithic regional groups. Present are rabbit, horse, deer, aurochs, bear, fox, ibex, boar, roe deer, beaver, but in small numbers. Most of the fauna is domesticated: cattle, sheep, goat, pig. The horse is present but rare (Blaise 2010).

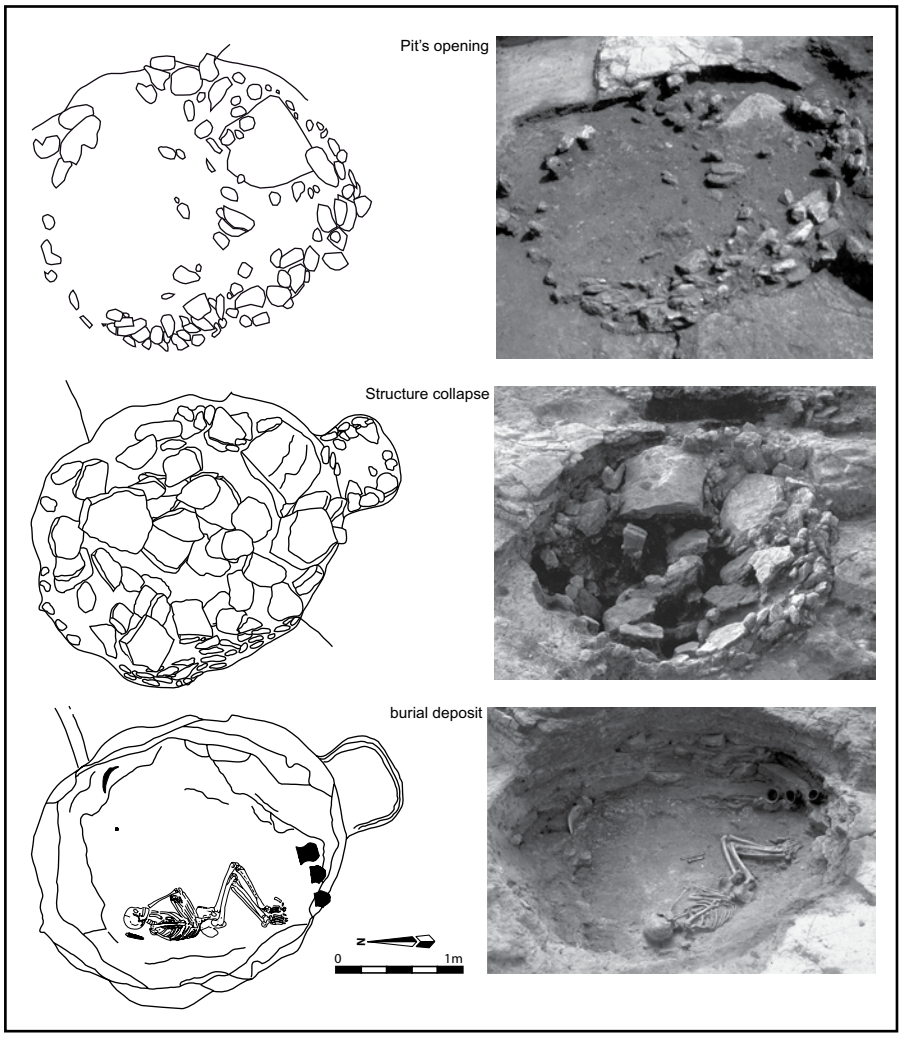

Figure 11. Early Bell Beaker single grave of Forcalquier-La Fare (Alpes-de-Haute-Provence).

Burials with Early Bell Beaker artifacts are for the most part collective burials in dolmens and gallery-tombs. Individual burials are not absent, but quite rare. The only well-preserved example is the burial at Forcalquier –La Fare (Lemercier *et al.* 2011). This is an ovoid pit 2.5 m in maximum diameter with a probably tumulus-like cover and a complex entry system with a step and a monolithic cover that makes this a mixed monument between hypogeic traditions and tumulus tombs (Fig. 11). It contained the body of an adult male lying on his left side, oriented north-south with the head to the north. Associated artifacts include a Bell Beaker goblet of mixed style, two goblets of local Rhône-Ouvèze style, a copper dagger blade, a bone object in the form of a bobbin and a small segmented bone bead. In Languedoc there are two possible individual burials, one at the site of Alignan-du-Vent – Chemin Dupeyne which contained the remains of a single individual associated with Early Bell Beaker pottery, and the other at Montpellier – Richter where a human femur is associated with a Bell Beaker goblet (Lemercier and Tchérémissinoff 2011).

Concerning the origin of these initial Bell Beaker elements, similarities can be found most often with material on the Iberian Peninsula, Portugal in particular (Lemercier 2004*a*). These include ceramic assemblages with both international and geometric dotted styles as well as fingernail decorations, some ornaments and some metal objects. The extreme rarity of elements that would suggest a northern origin, such as the large AOO and AOC goblets, is noteworthy (Guilaine *et al.* 2001).

The Middle Bell Beaker phase (*Campaniforme Récent*)

The Middle phase of the Bell Beaker in Mediterranean France is marked by the presence of two distinct regional groups which are easily distinguished by their decorated pottery, although they seem to have shared the same common ware. Geographically, the western part of the region from the Pyrenees and the Middle Garonne to central Languedoc was occupied by the Pyrenean group, while the eastern part, from eastern Languedoc to the Alps, was occupied by the Rhodano-Provençal group (Fig. 12).

The Rhodano-Provençal group

The ceramic of the Rhodano-Provençal group is diverse in form and at the same time highly uniform stylistically (Lemercier 2004*b*; Lemercier and Furestier 2009). Three pottery groups can be defined: decorated fine ware, undecorated fine ware, and common ware. The

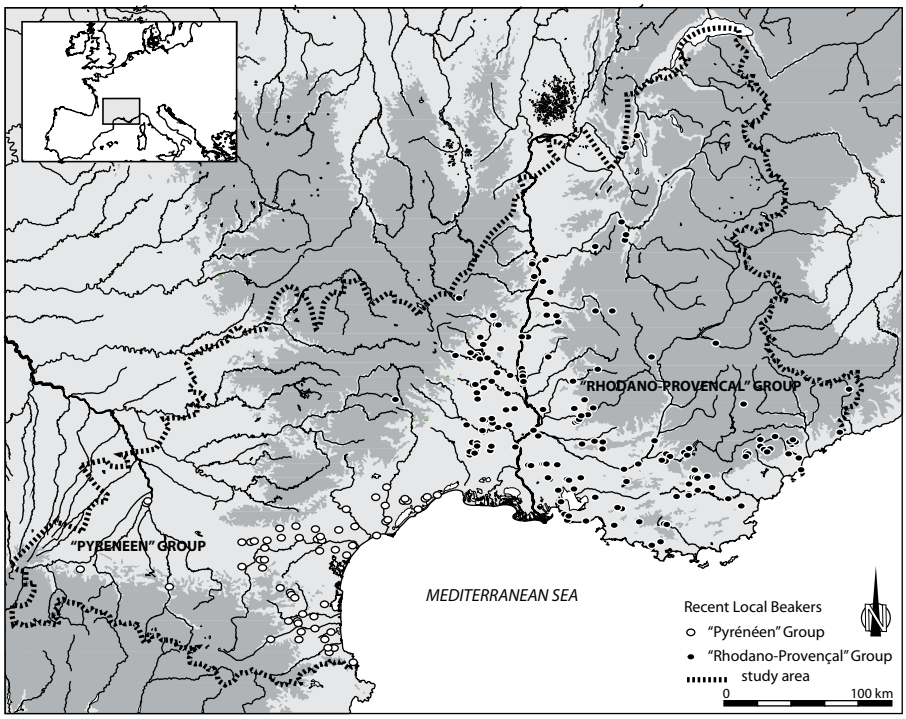

Figure 12. Distribution map of Middle Bell Beaker sites in Mediterranean France.

decorated pottery includes a wide range of forms both tall (goblets, bottles or pseudo-bottles and large pots or handled pitchers) and low (deep bowls, shallow bowls, basins, cups). Techniques for handles are similar, but uncommon (knob-lugs and handles). Decorations are positioned in horizontal rows that can cover the entire vessel or in alternate decorated and undecorated zones. Radiating decorations are clearly present on the low forms. Decorated zones and groups of decorated zones are delimited by incised lines or groups of lines. The recurrent theme is the decorated zone, bordered by incised lines and hatched perpendicularly with short incisions or impressions, creating a ladder motif. The fill of other kinds of zones is formed by generally multiple rows of stamped motifs (most often triangles and lozenges). These rows of motifs, which can be offset, are sometimes reversed, and define a type of decoration that is sometimes considered to be a completely separate style called "pseudo-excised". Some decorated vessels in this style may also have dotted decoration (Fig. 13-15).

Undecorated fine ware includes goblets, deep and shallow bowls and cups. They are morphologically identical with the decorated vessels. The common ware of the different assemblages of the

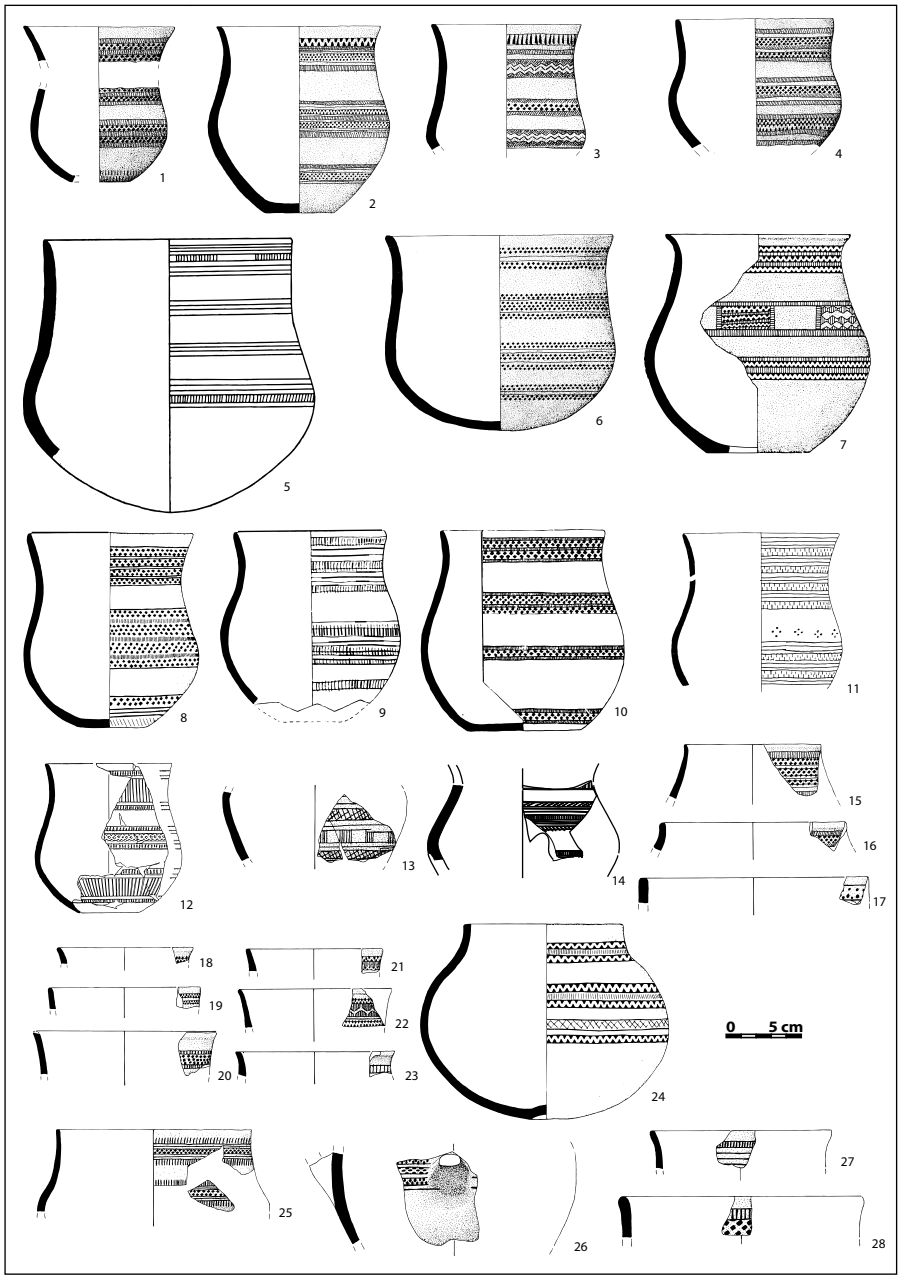

Figure 13. Middle Bell Beaker phase: "Rhodano-Provençal" group pottery. 1, 4, 6. Montpezat – Grotte Murée, 2 and 3. Sainte-Croix-du-Verdon – Abri du Jardin du Capitaine, 5. Gémenos – Grande Baume, 7. Plan de la Tour – Dolmen de San Sebastien, 8 and 24. Francillon – Baume Sourde, 9, 10, 14. Saint-Côme-et-Maruéjols – le Bois Sacré, 11. Sainte-Anastasie – Grotte Nicolas, 12. Donzère – Grotte de la Chauve-Souris, 13, 15-23, 25, 26. Simiane – Col Sainte-Anne, 27-28. Sabran – Le Gardonnet. (1-4, 6, 13-23, 25, 27, 28 after Lemercier 2004b; 5 after Courtin 1974; 7 after Sauzade et al. 1974; 8, 12, 24 after Bill 1973; 9 and 10 after Roudil et al. 1974; 11 after Gutherz and Hugues 1980).

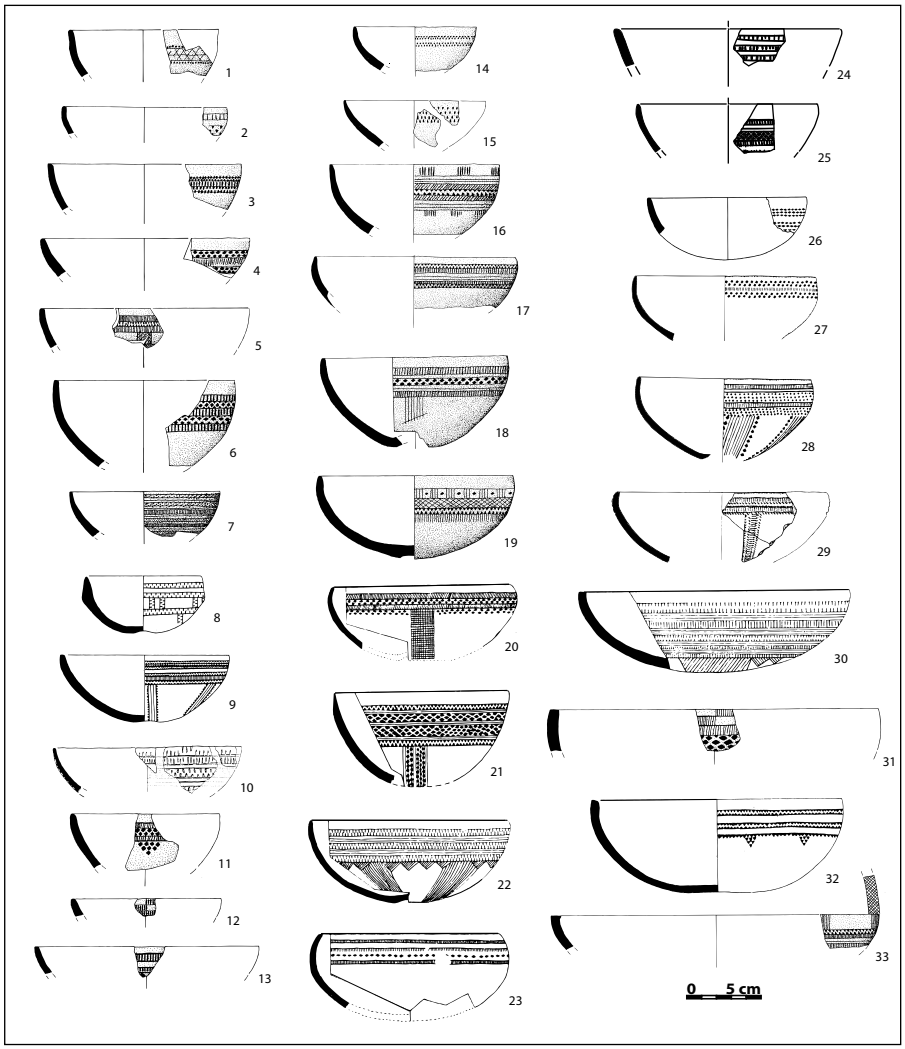

Figure 14. Middle Bell Beaker phase: "Rhodano-Provençal" group pottery. 1-7. Simiane – Col Sainte-Anne, 8, 9, 32. Laroque-sur-Pernes – Abri 2 du Fraischamps, 10. Mondragon – Les Ribauds, 11-13, 31. Sabran – Le Gardonnet, 14, 18, 19, 33. Montpezat – Grotte Murée, 15-17. Sainte-Croix-du-Verdon – Abri du Jardin du Capitaine, 20-24, 25, 30. Saint-Côme-et-Maruéjols – le Bois Sacré, 26. Martigues – Collet-Redon, 27-29. Francillon – Baume Sourde. (1-7, 11-19, 24, 25, 31, 33 after Lemercier 2004b; 8, 9, 32 after Paccard and Barge-Mahieu 1988; 10 after Margarit et al. 2002; 20-23, 30 after Roudil et al. 1974; 26 after Courtin 1974; 27-29 after Bill 1973).

Rhodano-Provençal group shows notable patterns. Medium-sized vessels are morphologically variable. Open and straight forms are fairly common and continuous profiles seem to be dominant. The rims are frequently flattened and sometimes everted or thickened toward the exterior. Bases are most commonly flat. Handles are rare

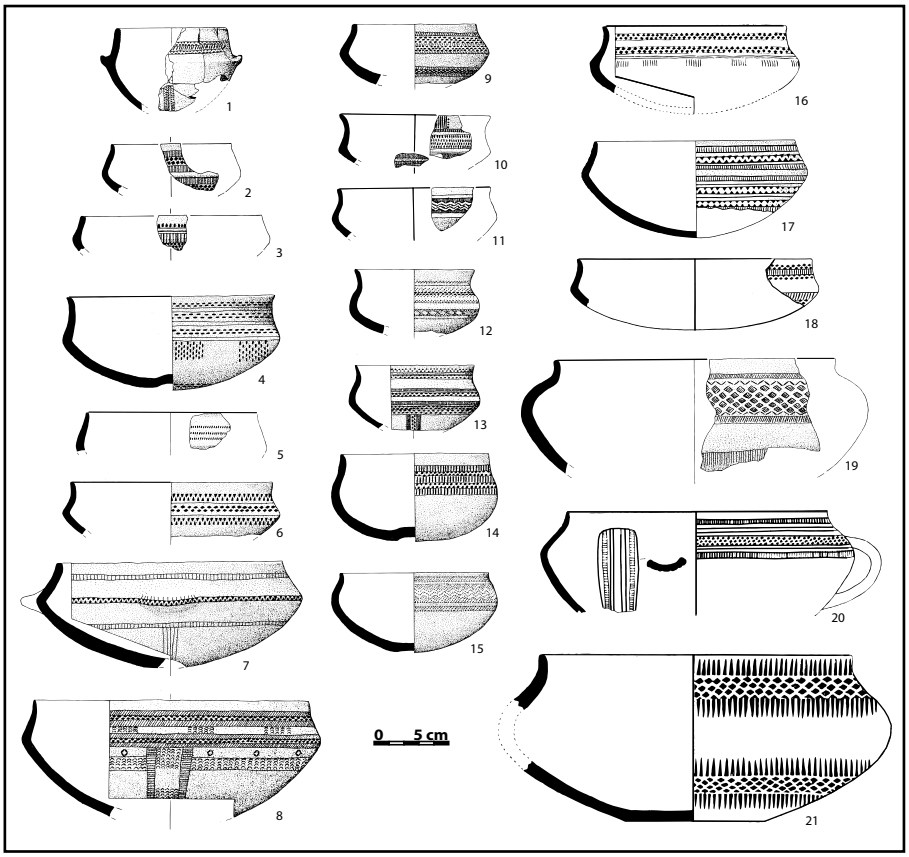

Figure 15. Middle Bell Beaker phase: "Rhodano-Provençal" group pottery. 1. Claix – Sépulture de Comboire, 2, 3, 18. Martigues – Collet-Redon, 5-6, 12-13, 19. Sainte-Croix-du-Verdon – Abri du Jardin du Capitaine, 8. Esparron-de-Verdon – Aven de Vauclare, 4, 7, 9, 10, 14-15. Montpezat – Grotte Murée, 11. Esparron-de-Verdon – Baume de l'eau, 16, 20-21. Saint-Côme-et-Maruéjols – le Bois Sacré, 17. Lourmarin – Les Lauzières. (1 after Picavet 1989; 2-15, 19 after Lemercier 2004b; 18 after Courtin 1974; 16, 20, 21 after Roudil et al. 1974; 17 after Courtin et al. 1985).

(knob-lugs and bumps). Large containers can be divided in several morphological groups. Fragments of flat bases of large diameters demonstrate the existence of large jars, although round bases are probably also present. The rims are most often flattened and sometimes thickened toward the exterior. Forms are fairly straight. Most of the complexes consist of medium-sized jars with a cordon in just below or directly attached to the rim. These cordons are generally triangular in section and smooth. Jars with rows of perforations just under the rim, associated with a cordon of triangular section are fairly common (Fig. 16).

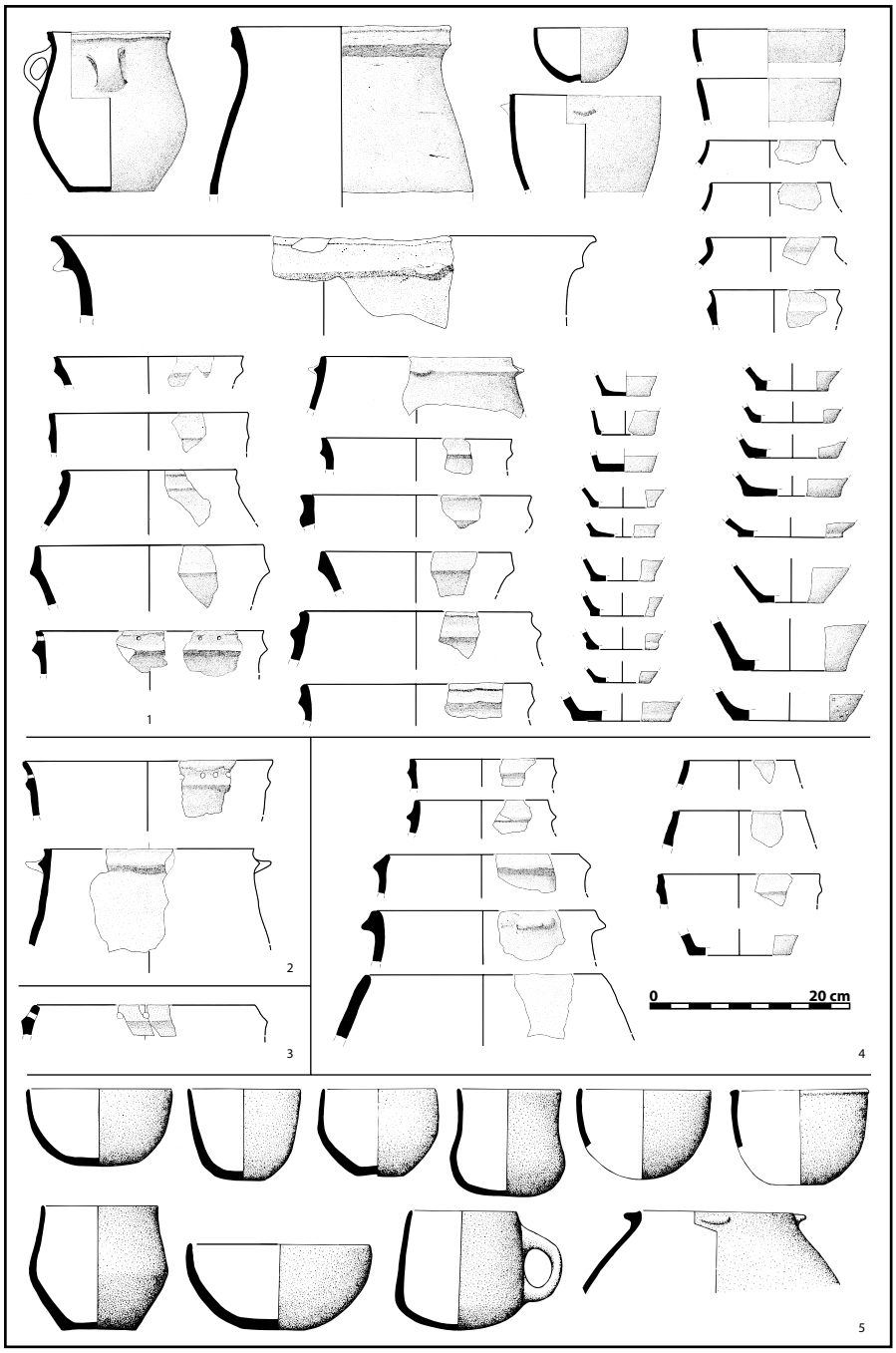

Figure 16. Middle Bell Beaker phase: "Rodano-Provençal" group domestic pottery. 1. Montpezat – Grotte Murée, 2. Esparron-de-Verdon – Aven de Vauclare, 3. Sabran – Le Gardonnet, 4. Sainte-Croix-du-Verdon – Abri du Jardin du Capitaine, 5. Saint-Côme-et-Maruéjols – Bois Sacré. (1-4 Lemercier 2004b; 5 after Roudil, Bazile, and Soulier in Guilaine 1989).

The lithic industry of the Rhodano-Provençal group shows marked links to the technological traditions of the local Final Neolithic cultures. Raw material procurement is primarily local, resulting in significant variability in flint quality. The size of these blocks, cobbles or flakes appears to be standard (rarely more than 10 cm). Used as cores, these were knapped by direct hard percussion or on anvil in order to produce a maximum of small flakes. One can see continuity in the dominance of splintered pieces and end-scrapers (often thumb-nail scrapers) in the domestic toolkit, reintegration of products of local Final Neolithic specialists such as large blades and daggers, and the appearance of new tools (microlit crescents and microdenticulates). Arrowheads are less common and the tanged and squared barbed type is no longer present (Furestier 2007; 2008). Copper tools from reliable Rhodano-Provençal context are very rare, but include short double-ended awls of square cross-section. Daggers are almost absent (Fig. 17).

Regarding ornamentation, V-perforated bone buttons and roughly arciform undecorated pendants are found alongside all of the types of ornamentation present at the end of the Neolithic. Bracers, generally of stone (limestone, sandstone), are well represented.

The centre of gravity of sites attributable to the Rhodano-Provençal group appears to be found in the lower Rhône Valley. With around 140 sites currently inventoried and concentrated on the immediate borders of the Rhône Valley and extending to interior Provence, this stylistic group clearly justifies the name "Rhodano-Provençal group".

With respect to settlement: while a third of the domestic sites are found in caves, most are open-air sites both on the plains and hill top settlements. No enclosures seem to have been constructed at this time. The architecture of houses remains poorly known, but is diversified by sector. In the Rhône Valley we find prepared surfaces, in eastern Languedoc stone paving of elongated oval form some ten meters long, and in the middle Rhône Valley architecture with wooden posts (Lemercier and Gilabert 2009).

Although economic data has not been specifically studied, evidence shows an agro-pastoral society that does not significantly differ from the regional Final Neolithic cultures. Nothing suggests that the people of the Bell Beaker Culture were a population or group specialised in a specific kind of activity. The only recurrent data concerning the animal economy indicates that hunting was slightly more diverse than for local Final Neolithic groups (Blaise 2010). In general procurement territories appear to have been fairly limited to the vicinity of the settlement (flint, rock for polishing, clay, *etc.*). This pattern follows a refocusing that starts with the beginning of

the Final Neolithic. However, some artifacts of regional or extra-regional provenance have also been documented.

The 38 burials or funerary ensembles known reflect a strong tradition (Lemercier and Tchérémissinoff 2011). Collective burials dominate (caves and rock shelters, hypogaea, dolmens, block tombs) and were frequently reused from the start of the 3rd millennium BC onwards. The only exception is an individual burial in settlement context at Montpezat – Grotte Murée, but this is a child's burial (Courtin *et al.* 2011).

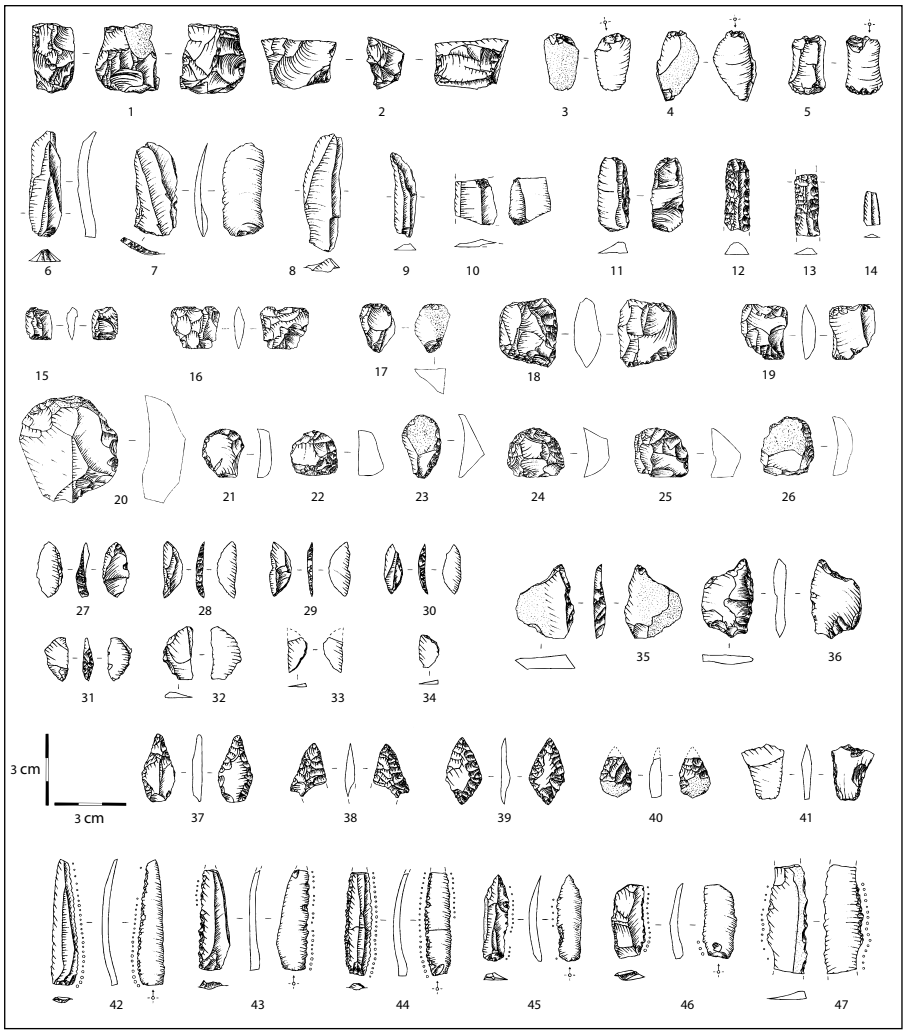

Figure 17. Middle Bell Beaker lithic industry. 1-2: cores; 3-5: flakes; 6-14: blades and bladelets; 15-19: splintered pieces; 20-26: scrapers; 27-34: microlith crescents; 35-36: borers; 37-41: arrowheads; 42-47: microdenticulates. 1-47. Nîmes – Mas de Vignoles IV (after Furestier 2007).

The Pyrenean group

The decorated ceramics of the Pyrenean group are very similar to those of the Rhodano-Provençal group, but have some unique characteristics in its decorative techniques. Incisions, impressions and dotting are still quite common, which can lead to confusion with objects belonging to the early phase of the geometric dotted style. Characteristic are also *fermeture éclair* (zipper) motifs and arrange-

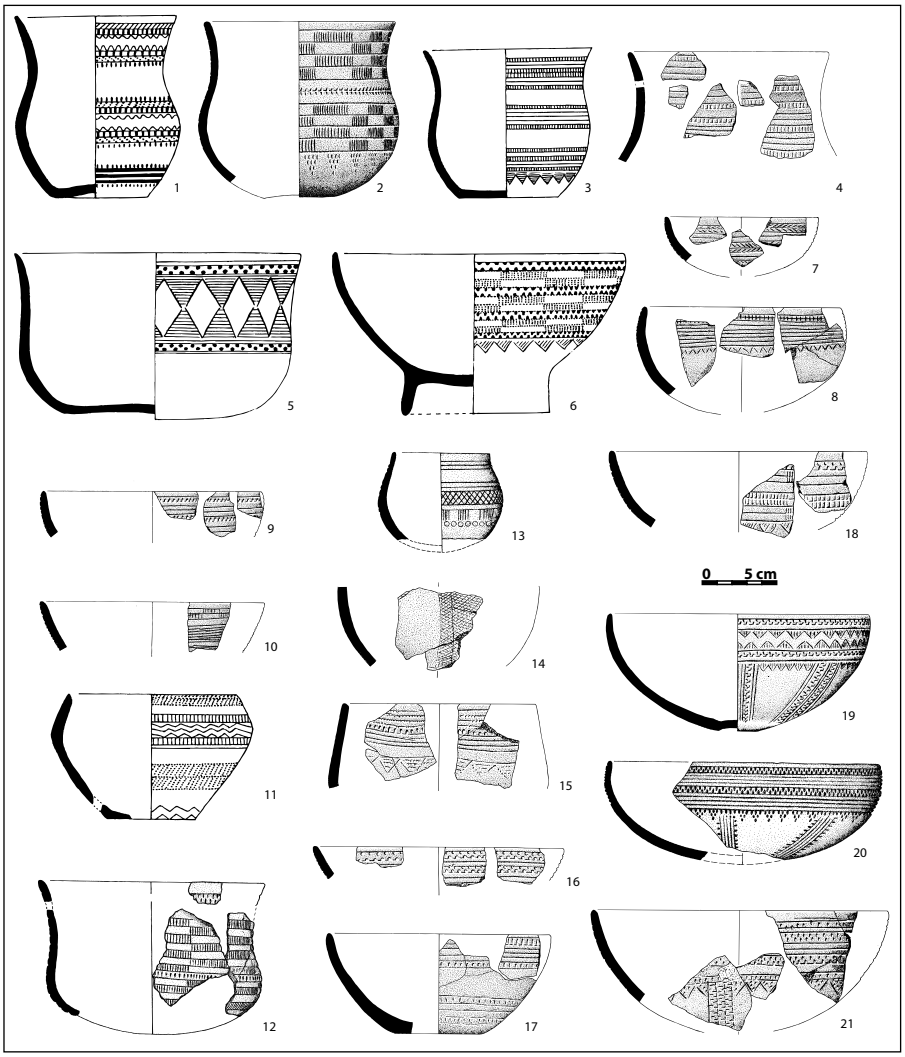

Figure 18. Middle Bell Beaker phase: "Pyrenean group" pottery. 1. Greffeil – Grotte des Charbonniers, 2, 4, 7, 8, 9, 10, 14-17-19, 21. Ornaisons – Médor, 3 and 5. Laure-Minervois – Dolmen de Saint-Eugène, 6. Armissan – Grotte du Pas du Noyer, 11. Mailhac – Embusco, 12. Fleury d'Aude – Petite Grotte de la Ganive, 13. Cessenon – Vialat, 20. Colombiers. (1, 3, 5, 6, 11 after Guilaine et al. 2001; 2, 4, 7, 8, 9, 10, 14-17-19, 21 after Guilaine et al. 1989; 6, 12, 13 after Ambert 2003).

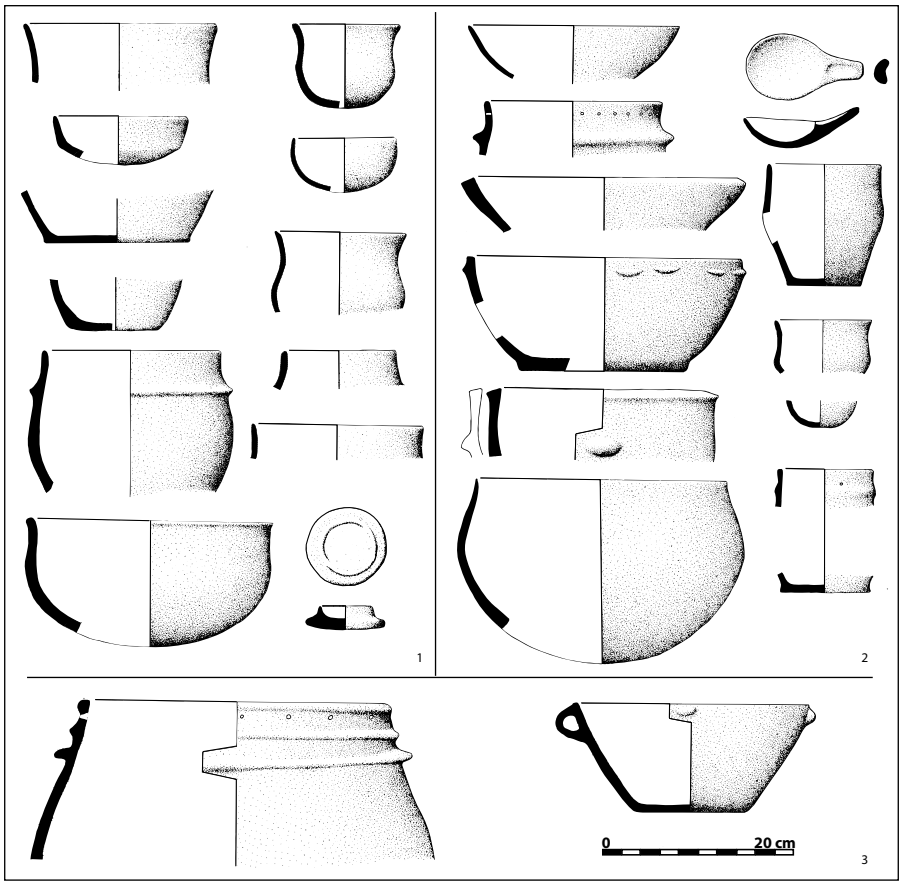

Figure 19. Middle Bell Beakers: "Pyrenean" group domestic pottery. 1. Ornaisons – Médor, 2. Muret – La Peyrère, 3. Conques-sur-Orbiel – Abri de Font Juvénal. (1 and 3 after Guilaine et al. 1989; 2 after Jolibert in Guilaine et al. 1989).

ments in metopes or checker-board pattern (Fig. 18; Guilaine *et al.* 2001). Undecorated pottery is represented by the same principal types as those of the Rhodano-Provençal group (Fig. 19).

Like the ornaments, the lithic industries of the Pyrenean group has not yet been studied in detail. At the site of Muret – Lapeyrère (Jolibert 1988) in the extreme west of the geographic zone of the Pyrenean group, tools are predominantly small sub-circular end-scrapers made on flint flakes. The presence of rare notches, borers, objects made on blades, and bladelets has been reported. A tanged and barbed arrowhead and six microlit crescents complete the assemblage.

The geographic distribution of the Pyrenean group is concentrated on the Gulf of Lion between the Pyrenean massif and the mouth of the Hérault. At present, the known sites are concentrated

along the coast and more so along rivers and the large communication routes, particularly the length of the Aude Valley, extending to the Garonne Basin in the region of Toulouse. Of the 63 definitively attributed sites, 31 are settlements or domestic and 26 are burials.

Settlements of the Pyrenean group remain poorly known, established at open-air sites and very rarely in caves. Constructions are unknown.

The 26 burials, which are uniformly distributed over the region under consideration, are mostly collective burials in megalithic structures or in caves (Lemercier and Tchérémissinoff 2011).

The best comparisons for the decorated pottery come once again from the Iberian Peninsula, but rather in Spain with the Ciempozuelos group (Garrido Pena 2000) for which some forms are identical to objects in the Rhodano-Provençal group (Lemercier 2003*b*). Some objects suggest other contacts, for instance microlit crescents point to contacts with Italy, while certain ceramic forms resemble forms in central or northern Europe. Domestic pottery seems to have been shared with other recent Bell Beaker groups across a large geographic area: in central Italy, Switzerland, the Rhône-Saône corridor to Normandy and along the Atlantic coast (Besse 2003; Leonini 2003).

The Late Bell Beaker phase (*Campaniforme Tardif*)

In the late phase, the decorated pottery shows on the one hand a Bell Beaker tradition in the structure of the decoration, and on the other new characteristics in the decorative techniques and morphology. Decorations are incised or made with a barbed wire stamp, sometimes both on the same vessel (Lemercier 2004*b*). While incision is well-known in preceding Bell Beaker decorative styles, barbed wire decoration is entirely specific to this period since it was made with a previously unknown technique using a threaded comb or stamp. Decorative themes include lines and bands of lines, sometimes curved to avoid a grasping element. Patterns of different kinds of chevrons are well-represented, as well as patterns of geometric bands and motifs with square and cross patterns rather than hatched. In some cases, stamped lines of motifs can be associated with these. The general organisation of the decorations is still dominated by the repetition of horizontal decorated zones often separated by empty zones in the Bell Beaker tradition. However, structuring in large square or rectangular panels, on some vessels limited by handles, is recurrent (Fig. 20).

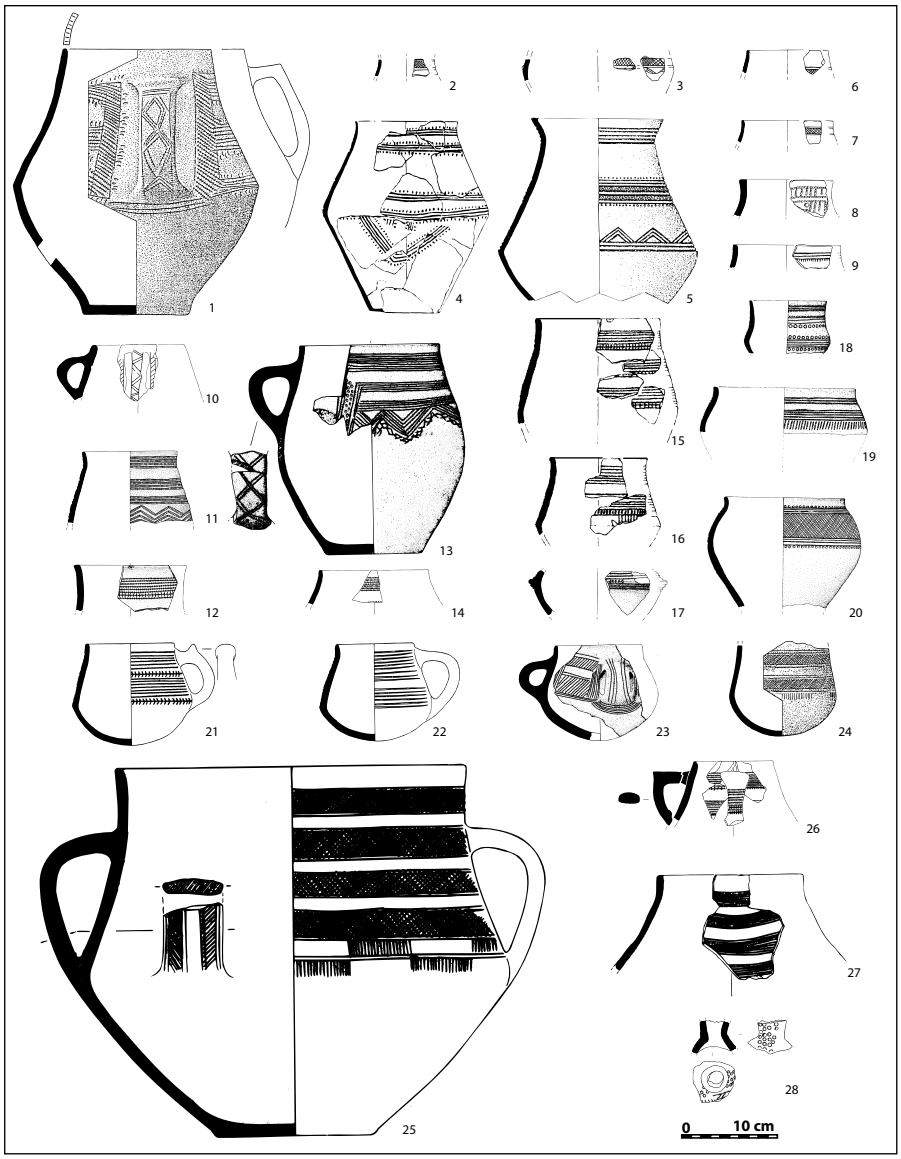

Figure 20. Late Bell Beaker phase: Barbed Wire pottery. 1 and 24. Aix-en-Provence – Clos Marie Louise, 2, 3, 6, 7. Le Beaucet – La Rouyère, 4. Saint-Jean-de-Maruéjols-et-Avéjan – Aven Roger, 5. Saint-Laurent-sous-Coiron – Aven des Cotes de Loup, 8, 9, 17, 28. Nîmes – Georges Besse II, 10. Istres – Miouvin, 11. Lourmarin – Les Lauzières, 12, 13, 15, 16, 23, 25, 27. Le Rove – Camp de Laure, 21 and 22. Allauch – Aven de Gages, 14 and 26. Martigues – Le Collet-Redon. (1 and 24 after Vignaud 2002; 2, 3, 6, 7 after Buisson-Catil and Vital 2002; 4 after Jallot et al. 1996; 5 after Roudil 1993; 8, 9, 17, 28 after Escallon et al. 2008; 10, 14, 26 after Lemercier 2004b; 11 after Courtin et al. 1985; 12, 13, 23, 25, 27 after Courtin 1978; 15 and 16 after Vital 2000; 21 and 22 after Courtin 1976).

The best represented forms include goblets with a generally flat base, but for which the S-profile is less curved or conversely much more segmented than during the preceding Bell Beaker phase. Some of these barrel-shaped, biconical or S-profile vessels have a single handle and are considered to be large pitchers. Smaller forms with a single handle and a simple or segmented profile and round base would be cups. The common ware pottery reflects a strong Bell Beaker tradition. Vessels have a flat base and include simple and

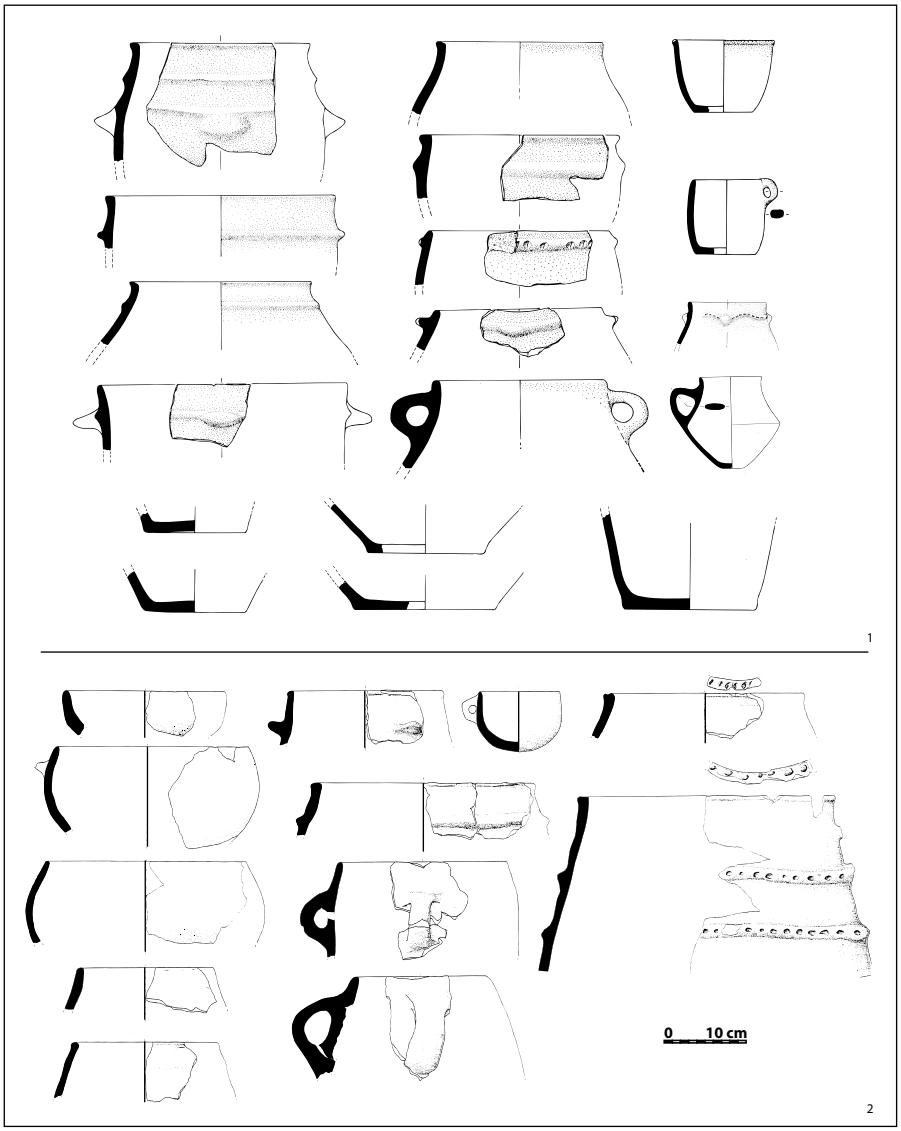

Figure 21. Late Bell Beakers: Barbed Wire domestic undecorated pottery. 1: Le Rove – Le Camp de Laure; 2: Aix-en-Provence – Clos Marie Louise. (1 after Courtin 1976; 1978; 2 after Leonini 2003).

rounded forms, sometimes have handles. Cylindrical and barrel-shaped jars of different size may have one or two cordons just below the rim. Smooth cordons are more common, but those with finger-print impressions are also present (Fig. 21).

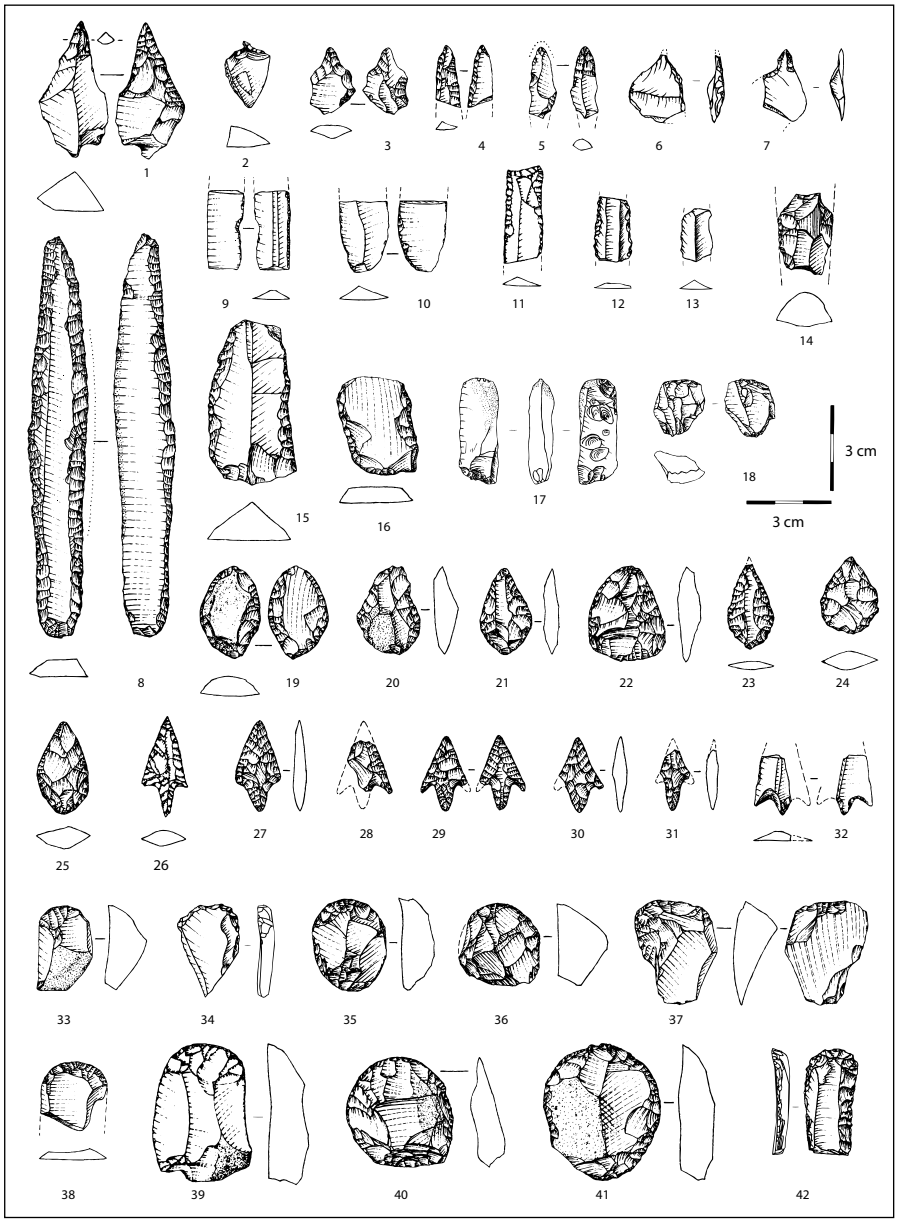

Figure 22. Late Bell Beaker lithic industry ("Barbed Wire pottery" group) y. 1-7: borers; 8-14: blades and bladelets; 15-16: side scrapers; 17-18: splintered pieces; 19-32: arrowheads; 33-42: scrapers. 1-42. Le Rove – Camp de Laure (after Furestier 2007).

The lithic industry confirms this strong Bell Beaker tradition (Furestier 2007). Raw material procurement, flake production and tool types remain comparable to those observed for the Rhodano-Provençal group. The toolkit is still dominated by end-scrapers and side-scrapers, foliate, tanged and barbed arrowheads, as well as splintered pieces (Fig. 22).

It is more difficult to describe the other industries. Only the presence of extremely rare and small bronze rhomboid-shaped awls seem to be truly characteristic.

In Mediterranean France, Epi-Bell Beaker sites are concentrated mainly in the lower basin of the Rhône (Fig. 23), although sites are occasionally known from the Pyrenees to the Alps. Their distribution falls outside the geographic scope of this study with a notable extension into the Lyon region, to Ain and Saône-et-Loire, but also in Auvergne. In the study region, 102 sites have yielded Late Bell Beaker elements. 62 sites are settlements or domestic occupations, of which four have included one or more burials, and only 19 are specifically funerary (the remaining sites mainly represented by isolated discoveries in caves). Occupation of caves and rock shelters has become very rare. Some sites show an obvious organisa-

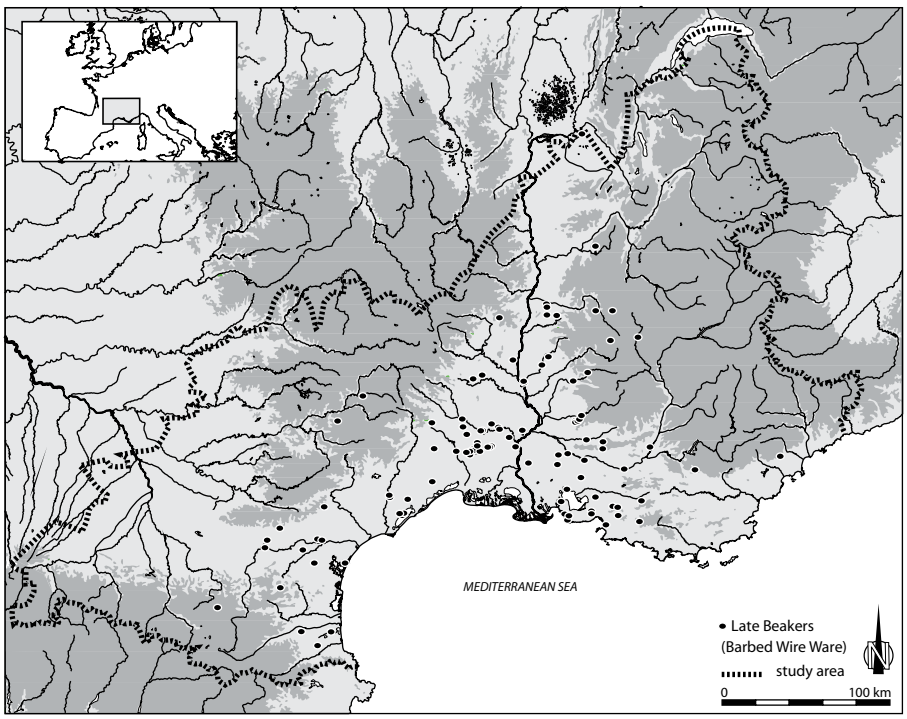

Figure 23. Distribution map of Late Bell Beaker sites ("Barbed Wire pottery" group) in Mediterranean France.

tion: Mondragon – Les Juilléras (Lemercier 2002), but architecture remains unknown (Lemercier and Gilabert 2009). As during the first phase there is a strong tendency for perched sites. Some Final Neolithic perched sites with enclosure systems were reoccupied during this period, but the original aspect of this period lies in the organisation of new enclosed or fortified sites: Le Rove – Camp de Laure (Courtin 1975). Burials are fairly diverse, but especially show the true development of individual burials, and probably of small cemeteries (Lemercier and Tchérémissinoff 2011).

Ceramic forms reflect both a Bell Beaker tradition for part of the common ware and an Italian origin with forms well-known in central Italy: Sesto Fiorentino Sites (Sarti 1997; Sarti and Martini 2000) and northern Italy. Barbed wire decoration is probably to be found in the northwest Balkans in Slovenia. The combination of these two elements may have taken place in northern Italy where vessels with barbed wire decoration are known: Villanuova sul Clisi – Monte Covolo (Poggiani Keller and Baioni 2008).

Model and interpretation

The hypothesis proposed here (Fig. 24), of the "explorations, establishment, diffusion, colonisation and acculturation" type, is similar to models developed for the recent protohistoric period in the same regions, such as that proposed by A. Nickels for Greek settlement in Languedoc (Nickels 1983).

His model proposes three phases. The first is the "exploration phase" and concerns the initial contacts between the Greeks and local populations. It is marked by the presence, in some tombs, of imported vases. These are rare and belong almost exclusively to the class of drinking vessels. Such objects would have been given as gifts during episodic contacts linked to coastal exploration by Greek navigators. The second phase corresponds to regular contacts, an intensification of trade and settlement attempts. It is later than the founding of Marseille by the Phocians in the neighbouring region. This phase is first marked by an increase in Greek objects and imports, and by a change in the kinds of objects since amphorae appear in quantity, reflecting economic changes. The creation of workshops for the production of monochrome gray pottery in Languedoc is of particular interest to Nickels. And, indeed, in less than a quarter of a century this type of pottery would come to represent 80% of the fine pottery on all the coastal sites and many interior sites. For this period, archaeologists assume the absence of Greek colonies in this region, neither are there written sources to that effect. To explain the role of these workshops, Nickels discusses several hypotheses, concluding with the hypothesis (Nickels 1983, 418): "*a permanent*

<table>
<tr><th>Protohistoric Model</th><th>Iron Age Evidences</th><th>Final Neolithic/Beakers Evidences</th><th>Interpretations</th></tr>
<tr><td>Phase 3:
Settlements
Cohabitation / Acculturation
High exchange intensification</td><td>New culture
"Massaliètes" Settlements
Mixed necropolis
Imported objects of several areas</td><td>Recent Beakers
Numerous New Beakers settlements dying out indigenous cultures
Complete material culture style related to Iberic Peninsula
Imported objects of several areas</td><td>Acculturation of indigenous cultures
High connection with Iberic Peninsula
Exchange with several regions</td></tr>
<tr><td>Phase 2:
Regular contacts
Exchange/trade intensification
First settlements</td><td>Transport containers
local vessel production (and diffusion)</td><td rowspan="2">Early Beakers
Beakers drinking vessel in indigenous burials
Mixed settlements
Transfer of technology
Local vessel production</td><td rowspan="2">1 2
Exploration and first beakers settlements
Relations with indigenous
vessel diffusion inside of lands
Installation and cohabitation phase
Exploration and objects diffusion phase</td></tr>
<tr><td>Phase 1:
Exploration
First Contacts
Gifts/Presents</td><td>Imported drinking vessels in indigenous burials</td></tr>
</table>

Figure 24. Greek model and interpretation of Beaker data.

settlement of a small group of Phocians within – or next to – a local community […], the hypothesis that best fits archaeological observations." This phase also includes attempts to penetrate the hinterlands. The third phase of this interpretation is that of the Massalia control over Languedoc which sees the creation of a Massaliot establishment (Agde). The post had a military function, but the necropolis linked to it shows the presence of different rites corresponding to different populations "*which implies […] the cohabitation in the post itself of the same elements of different origins […] as Ampurias, another Phocian colony where the cohabitation of indigenous peoples and Greeks is attested*." (Nickels 1983, 423) This period is also marked by intensification of trade. Imported Greek objects are very common, but at the same time specifically Massaliot production develops, which, however, come up against fierce competition by Ibero-Punic products that pass through Ampurias.

My aim is not to use this model as a direct parallel for the Bell Beaker phenomenon. In essence it is simply another archaeological interpretation for another period likely governed by economic and social conditions that were at least in part different from those at the end of the Neolithic. Such historical interpretations can be advanced for the Greeks in Languedoc only when supported by information obtained from written sources. It is, however, interesting to note the broad similarity in the observed archaeological data and the coherence of the interpretations that can be made.

We would thus have an initial phase, with the early Bell Beaker people undertaking maritime exploration, with the first establishments along the coast and the principal rivers going into the continent. These occupations immediately evidence contact, or even very rapid coexistence, with local populations at perched, naturally defensible, sites. In parallel, the spread of Bell Beaker goblets toward the interior can be observed, acquired by locals who carried them to their graves. Mediterranean France was thus in a relay position along axes of diffusion that extended both toward the high Rhône Valley, the Saône, Switzerland, *etc.*, and toward Italy (Lemercier *et al.* 2007).

The second phase corresponds to the acculturation of local populations in which cultural groups tended to disappear with the development of regional groups of the Recent Bell Beaker period. Sites of all types develop in number and across the entire territory. Contacts with the Iberian Peninsula were probably very important, but Mediterranean France also received objects/individuals from other Bell Beaker regions in Europe.

The third phase, with the development of the Late Bell Beaker, is not comparable with this first model, but involves a new influx, now from the east with a new phase of hill top sites and the appearance of fortifications. Bell Beaker traditions disappear between 1900 and 1800 BC, when another Rhodanian cultural entity is established and bronze objects are massively diffused.

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Chapter 6

Bell Beakers and the cultural milieu of north European plain

Janusz Czebreszuk and Marzena Szmyt

Abstract

It is clear that not only cultural backgrounds for the Bell Beakers in north and south Poland are different, but also that the Bell Beakers in these two parts of the country vary. The authors deal with the northern zone (Pomerania, Wielkopolska and Kujawy regions) where strong connections are observed with the Single Grave Culture (from northern Germany and Jutland) and with the regional Corded Ware Culture. Bell Beaker traits are recorded there mostly on settlements and not in burials. A long typochronological Bell Beaker sequence is established and their important role in the long-lasting cultural developments in the region is proposed.

Keywords

Bell Beakers, northwest Poland, Corded Ware Culture, Single Grave Culture, typochronological sequence, long-lasting cultural development

In the general view of the Bell Beakers in Europe Polish lands constitute north-eastern range (Fig. 1).

The Bell Beaker relics are known there from the western (Western Pomerania, Kujawy, Wielkopolska, Silesia) and southern (Małopolska) parts of the country (Fig. 2) (Czebreszuk 2003).

The last ten years of research have shown that the Bell Beakers were not of the same provenance but derived from three different areas, which shows the activity of three different Bell Beaker centres. More specifically, Bell Beaker traits in the north (Pomerania, Wielkopolska and Kujawy) derive from Jutland and northeast Germany (Czebreszuk 2001) while in Silesia they show affinities with the Bohemian Bell Beakers (Makarowicz 2003). In Małopolska they are an offshoot of the Bell Beakers from Moravia (Budziszewski and Włodarczak 2010). The situation in Małopolska (Fig. 3) is special because we deal there with graves only, the traits of which are rooted in the Moravian Bell Beakers. This link is interpreted as a result of migration north of the Carpathians, most probably across the Moravian Gate, by a small group of people, representing the Moravian Bell Beaker Culture (Budziszewski and Włodarczak 2010). Their presence in Małopolska was an important factor in the origins of the Mierzanowice culture, which flourished best in its early stages of development that grew directly on a 'Beaker' substratum (Kadrow and Machnik 1997).

In Silesia and northwest Poland, the Bell Beakers had an impact on many areas of life and brought about more long-range cultural effects. They are a sign that populations inhabiting these regions took part in far-reaching networks of cultural contacts and witnessed progressive changes in their social structure (Czebreszuk 2001; 2003; Makarowicz 2003). Both regions, however, display clear differences in the origins of the Bell Beakers and in the role they played in regional cultural milieus.

The Silesian Bell Beakers (Fig. 4), known exclusively from funerary contexts, were related to those in the Bohemian Basin. However, not much more can be said on this subject due to the lack of research into the Silesian Bell Beakers. Despite the fact that more recent data are available (*e.g.* Gralak 2007), general findings still rely on publications from the 1970s and 1980s (Wojciechowski 1972; 1987). Similar difficulties hinder the study of the period that precedes the Bell Beakers and that relates to the Corded Ware Culture. By contrast, far more is known on the time horizon following the Bell Beakers, when the Únětice Culture thrived in both regions. At that time, Trans-Sudete cultural ties were strong, which is illustrated by the traits of the Bohemian and Silesian Únětice Culture (Zich 1996; Butent-Stefaniak 1997; Bartelheim 1998).

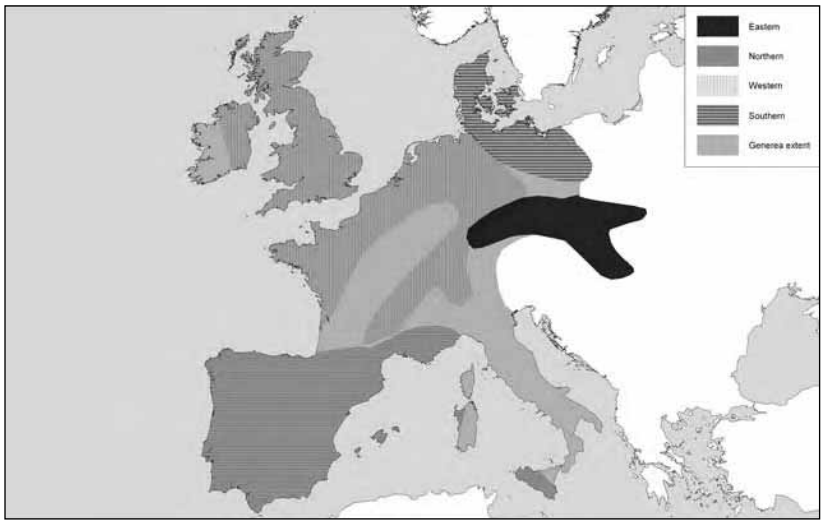

Figure 1. Bell Beakers in Europe: overall view. Czebreszuk 2003, simplified.

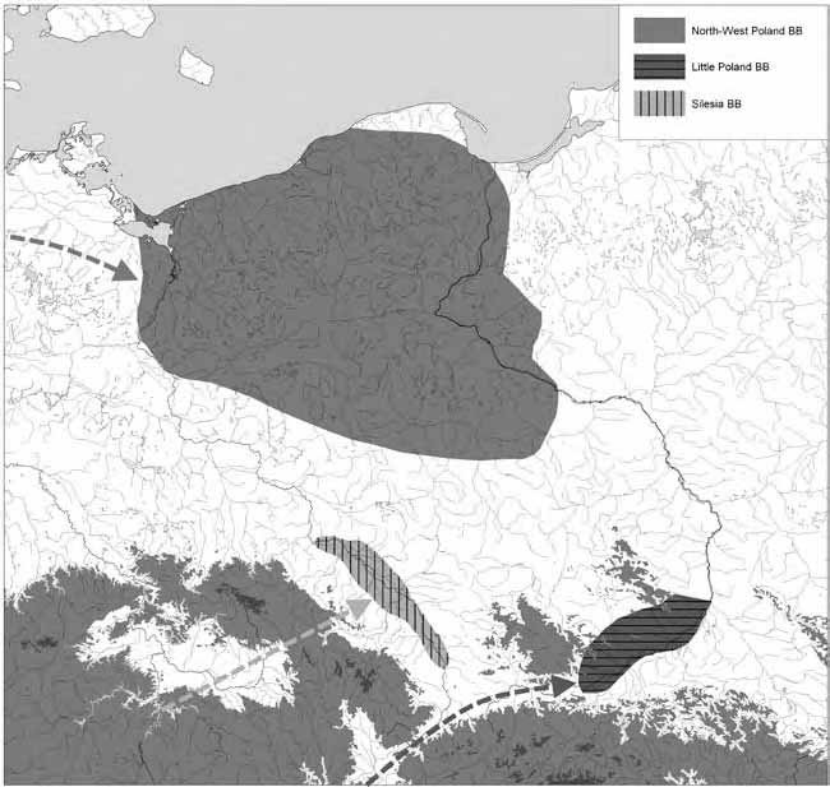

Figure 2. Bell Beakers in Poland and its connections with others centres.

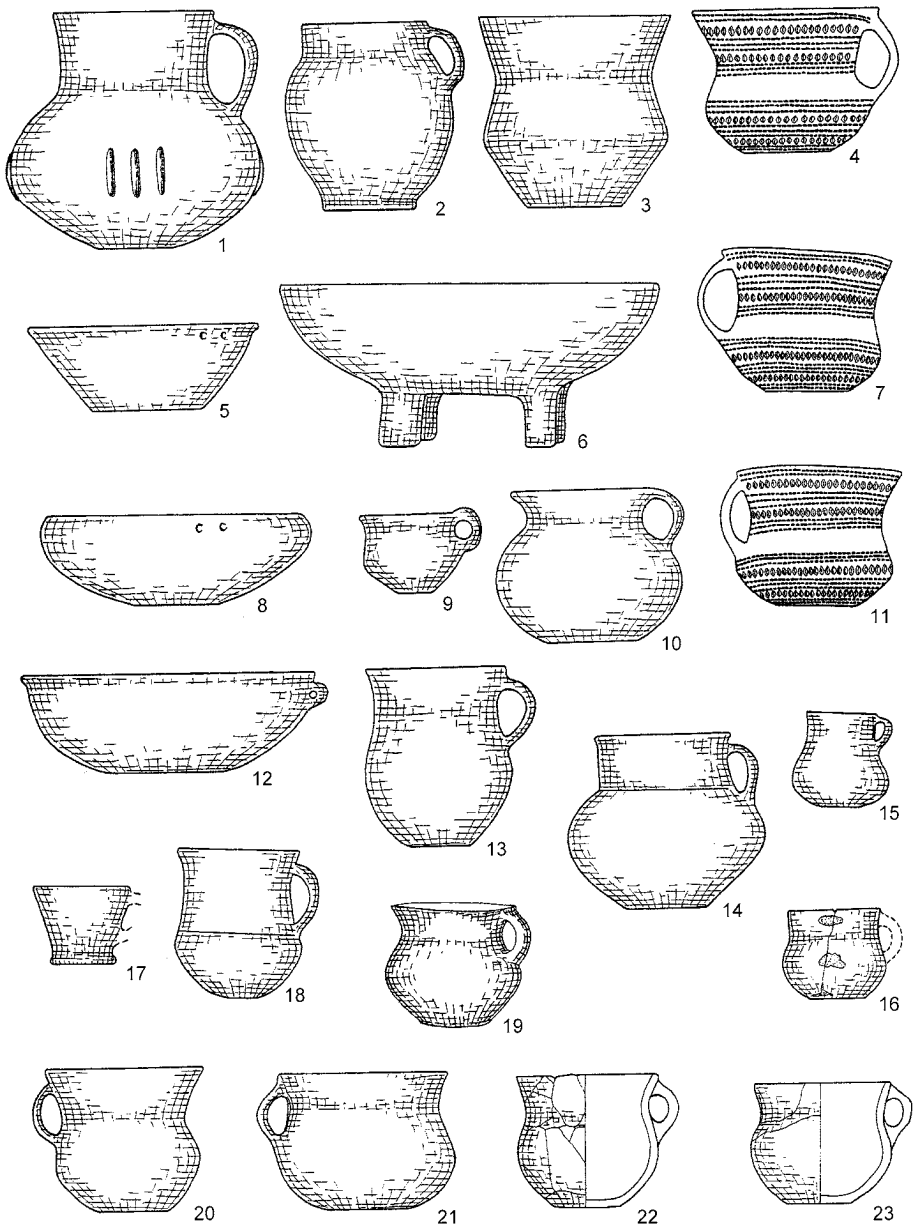

Figure 3. Bell Beaker pottery from Małopolska. Some examples: 1, 2, 5, 6, 12, 14 – Samborzec, 4, 7, 10, 11, 19, 21 – Beradź, 8, 20 – Święcice, 9, 13, 17, 18 – Złota, 22, 23 – Sandomierz. Makarowicz 2003.

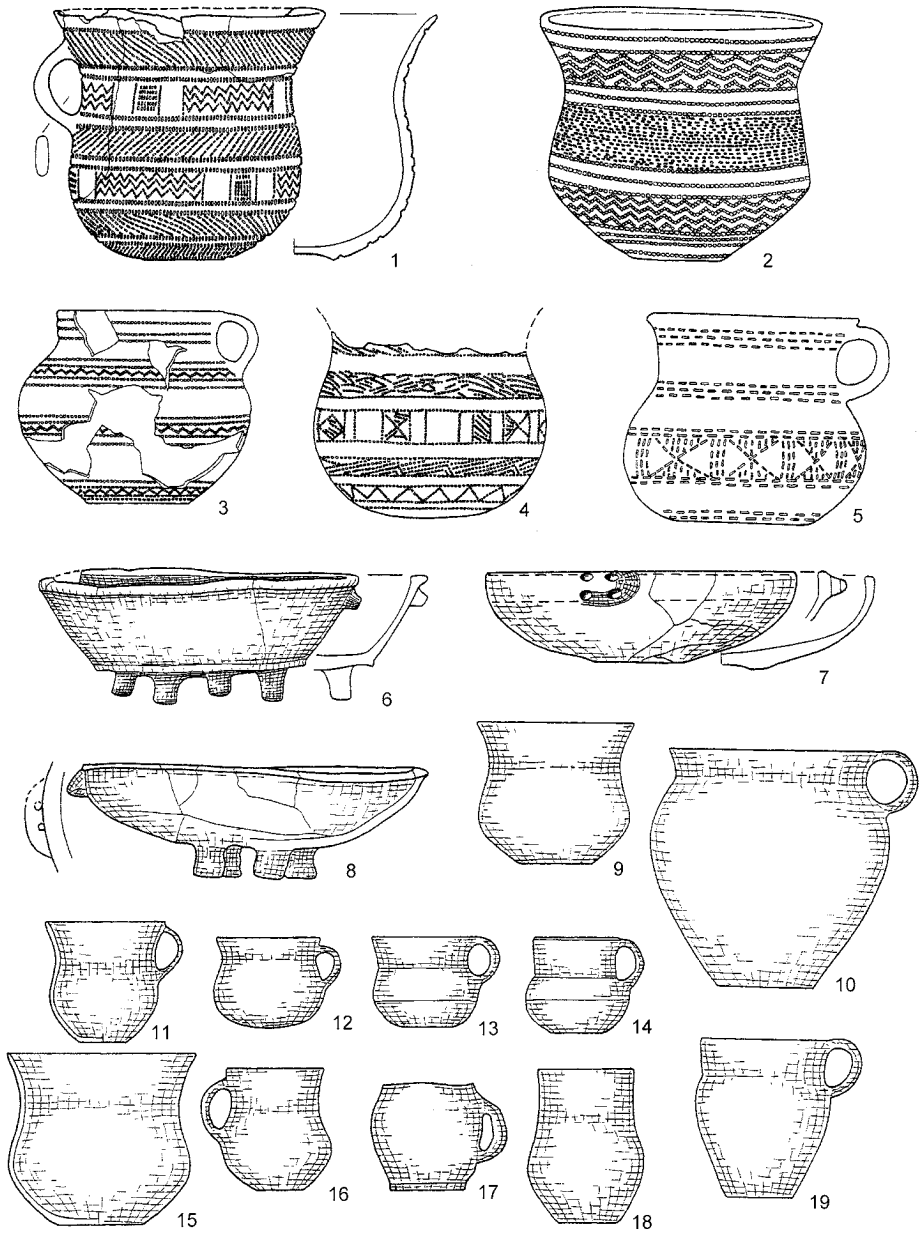

Figure 4. Bell Beaker pottery from Lower Silesia. Some examples. 1. Strachów, 2. Wrocław-Oporów, 3, 4, 7-19. Pietrowice Wielkie, 5. Opatowice, 6. Żerniki Wielkie. Makarowicz 2003.

To sum up, a strong case can be made to suggest very dynamic ties between the communities of Silesia and Bohemia in this period of prehistory. This is true for the horizon preceding the Bell Beakers (*i.e.* the Corded Ware Culture) and that following them (*i.e.* the Únětice Culture). From this point of view, the Bell Beakers appear to be a stage in the long participation of Silesian communities in the supra-regional structures of cultural information circulation.

Long-lasting and supraregional relations have been studied the most thoroughly with respect to northwest Poland and Bell Beaker traits. Pomerania (especially areas on the lower Oder River), Wielkopolska and Kujawy periodically displayed close contacts with the areas of north Germany and Jutland. The contacts had continued for a long time or since the Mesolithic, which is attested to by the spread of Post-Maglemosian communities (Fig. 5).

They are referred to in archaeological taxonomy as the Oldesloe and Chojnice-Pieńki Cultures (Kozłowski and Kozłowski 1975; Bagniewski 2001), which existed in the latter half of the Atlantic period and in the early Sub-Boreal period.

Another example of such West-East relations concerns the rise of communities related to the Ertebølle-Ellerbek group (Czerniak and Kabaciński 1997; see also Czekaj-Zastawny, Kabaciński, and Terberger 2011). These were coastal communities, maintaining a sedentary lifestyle and taking advantage of a rich littoral niche.

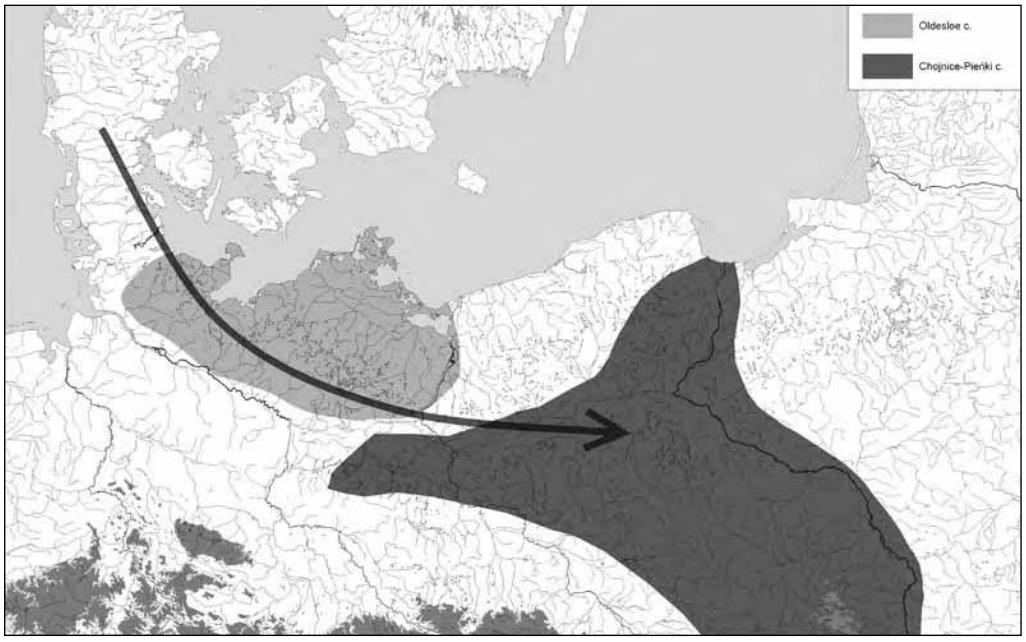

Figure 5. Network of supraregional contacts in the southern Baltic in the late Mesolithic. Kozłowski and Kozłowski 1975.

Their settlements can be found in Pomerania. It is very likely that these represent but a few vestiges of a once very dense network of sites. Due to changes in the Baltic coastline, caused by the rise of the sea level, the most densely settled area in the 5th millennium cal BC is now submerged under water of a few to almost twenty meters deep.

A still further example of sustained cultural ties extending along the southern Baltic coast involves the supra-regional structure of the Funnel Beaker Culture (Fig. 6).

Its significance lies in the relations between two groups recognised in this region: a northern (with its centre on Jutland) and an eastern group (with its major centre in Kujawy) (Kośko 1981, 62). In that period, *i.e.* in the late 5th and in the course of the 4th millennia cal BC, Pomerania was a place where information was vigorously exchanged. This is reflected in the presence of traits of both groups (Wierzbicki 1999). The region that deserves special attention in this context, is the lower Oder region, where the line of contacts between Jutland and Kujawy crossed with an east-west line of cultural ties, continuing as far as the Paris Basin (Rzepecki 2004, 158).

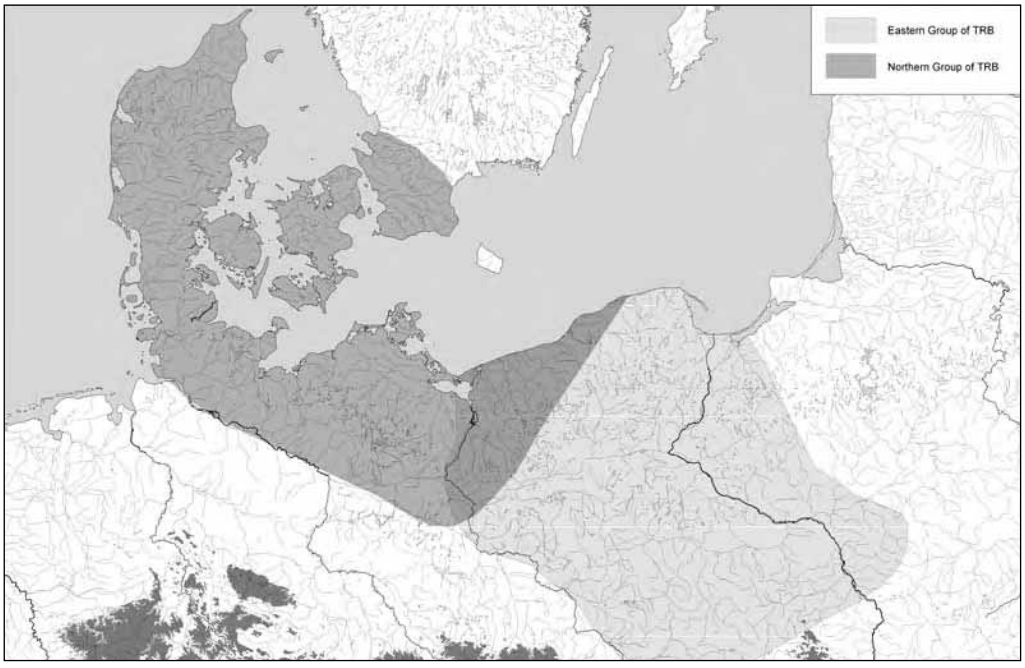

Figure 6. Near Baltic structures of the Funnel Beaker Culture. Wiślański 1979.

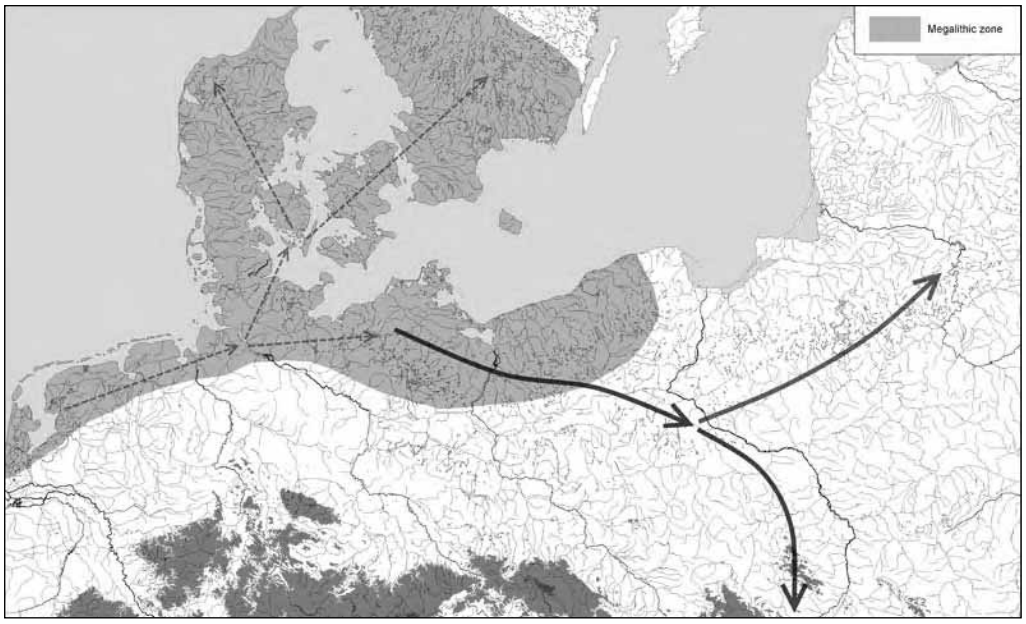

Figure 7. Spread of the megalithic idea in the Baltic zone. Kaczanowska and Kozłowski 2005.

It was to the Funnel Beaker Culture that the spread of the megalithic idea (Fig. 7) was related as well (cf. Libera and Tunia 2006). One of the routes followed by the idea extended along the southern Baltic coast.

From the beginning of the 3rd millennium cal BC a stable network of long-range contacts was created. Its beginning is marked by the earliest stage of the Corded Ware Culture known as Pan-European horizon (Buchvaldek 1986; Furholt 2003). It covered all of central Europe, including the route of cultural contacts along the whole southern Baltic coast.

Towards the end of the first half of the 3rd millennium cal BC the Single Grave Culture (Hübner 2005) (Fig. 8) reached - along the channels of cultural contacts that were already present - from its centre in Jutland to Mecklenburg, Pomerania and Kujawy (Czebreszuk 2001, 88-116).

Recent research shows that the exchange was reciprocal, but that communities that inhabited Kujawy and Wielkopolska in that period nevertheless developed independently, maintaining a clear autonomy and distinct own character (Pospieszny 2009).

Within the framework of the long-range exchange that was organized by the communities of the Single Grave Culture, shortly after 2500 cal BC the first Bell Beaker's traits appeared. From then on in the area from Jutland in the west to Kujawy in the east, a dis-

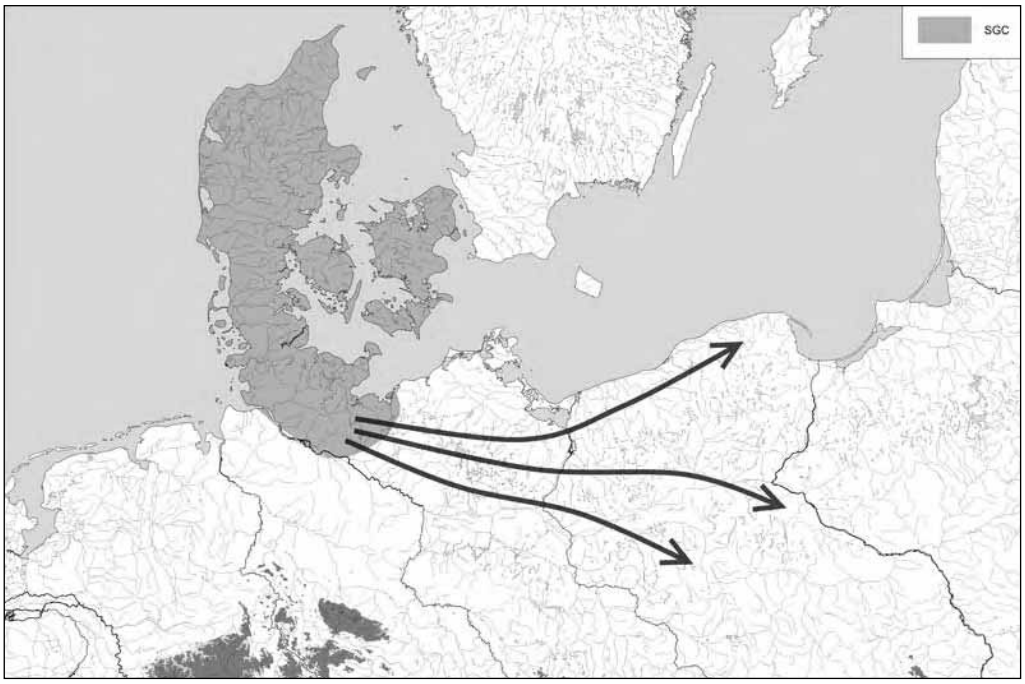

Figure 8. Main directions of cultural influences of the Single Grave Culture in the south Baltic zone.

tinctive node in the pan-European Bell Beaker network took shape referred to as the north group (Czebreszuk 2003).

The special character that distinguishes the north group from other Bell Beaker groups (cf. Vander Linden 2006), is the fact that Bell Beaker traits are found chiefly in settlement contexts, and to a much lesser extend in burial context, which manifests as a few secondary burials in older communal graves (see *e.g.* Czebreszuk 2001; Liversage 2003; Mertens 2003; Rassmann 2003). Bell Beaker traits are visible above all in pottery, specifically in its ornamentation. The development of ornamentation is divided in three phases or horizons. The earliest stage is characterized by the use of a knurling technique to make ornament zones on vessels that in shape resemble bell beakers ((Fig. 9; Czebreszuk 2001).

The zonal arrangement of ornaments was applied not only in the form of patterns made with the knurling technique, but also made with cord impressions or incisions.

Next, zones with metope ornamentation appeared on the pottery (Fig. 10), which in form took on ever more squatty proportions. This change in the form can be described as evolution from slender beakers to visibly shorter and squattier vases. At this stage, ornaments were made using above all the incision technique (Czebreszuk 2001).

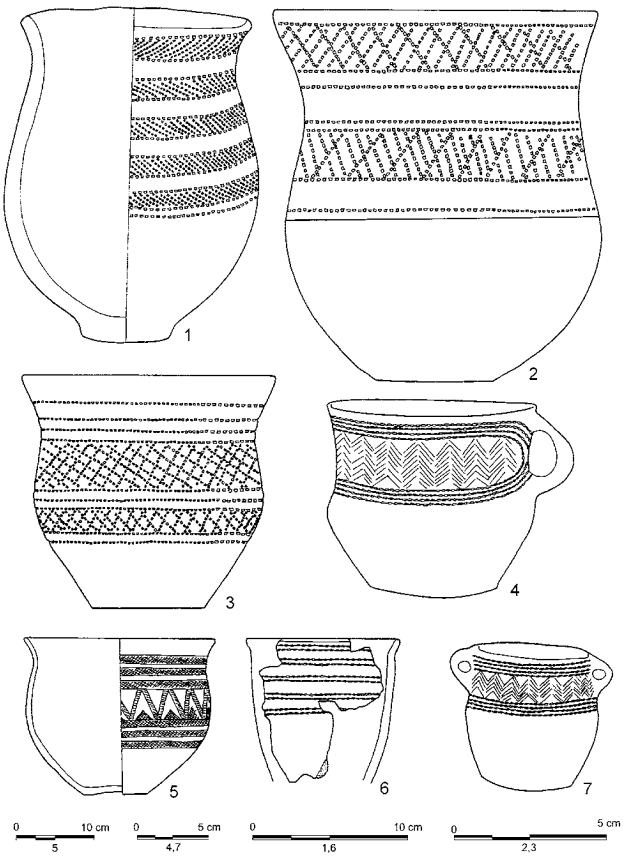

Figure 9. Northern group of the Bell Beakers. Pottery with zone ornamentation. Some examples: 1. Dumsewitz (North Germany), 2. Zikhausen (North Germany), 3. Bobzin (North Germany), 4 and 7. Bobin (Pomerania, Poland), 5. Myrhoj (Denmark), 6. Parchanki (Kujawy, Poland).

The final stage of development of Bell Beaker traits on the south-west Baltic is marked by the so-called *barbed wire* ornament (Fig. 11) (Czebreszuk 2001), which is visibly less accurate and varied than in the previous stages.

In Kujawy and Wielkopolska, this late Bell Beakers stage also marks the inception of a new sequence of changes, taking the form of the so-called Trzciniec horizon (Czebreszuk 1998). Phenomena consistent with the Trzciniec cultural circle can be found across vast areas of central and eastern Europe, from the Warta drainage as far as the middle Dnieper (Makarowicz 2010).

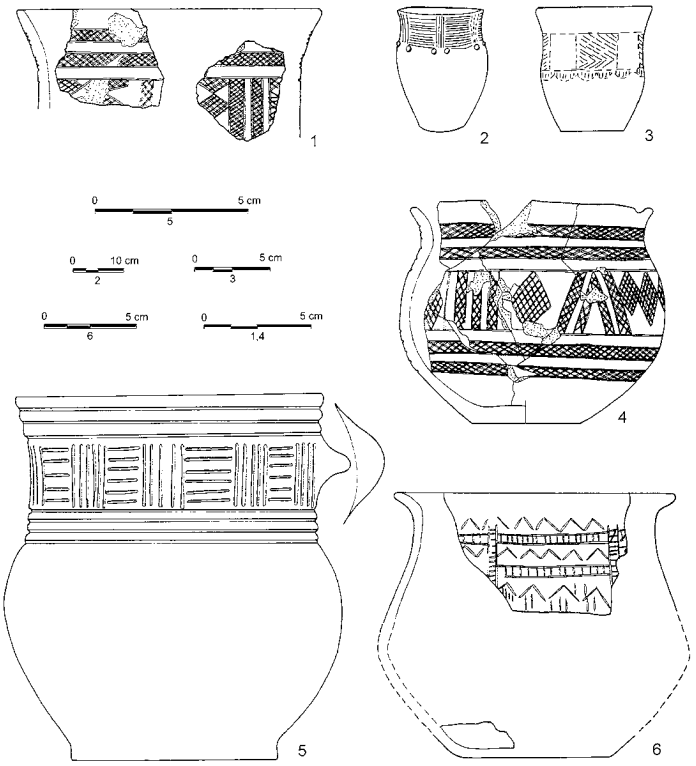

Figure 10. Northern group of the Bell Beakers. Pottery with zone-metopic ornamentation. Some examples: 1 and 4. Myrhøj (Denmark), 2. Nowy Młyn, (Kujawy, Poland), 3. Steinberg (North Germany), 5. Pinow (North Germany), 6. Sulęcinek (Kujawy, Poland).

Taking a more general view, it must be observed that Bell Beaker traits in the northern group fit well into a stable and long sequence of material culture changes (Fig. 12), especially of pottery, that begins with the origins of the Corded Ware Culture, in the early 3rd millennium cal BC, and ends at the developed stage of the Trzciniec horizon (phase TH3), around the middle of the 2nd millennium cal BC (Makarowicz 2010, fig. 1.7).

The sequence looks as follows:

- Corded Ware Culture (in Kujawy, it is divided into phases 1, 2, 3 and 4 for greater accuracy; see Czebreszuk 1996),
- Bell Beakers (in Kujawy: phases 1, 2, and 3, see Czebreszuk 1996),
- Trzciniec horizon (in Kujawy, phases TH 1, 2 and 3; see Makarowicz 1998).

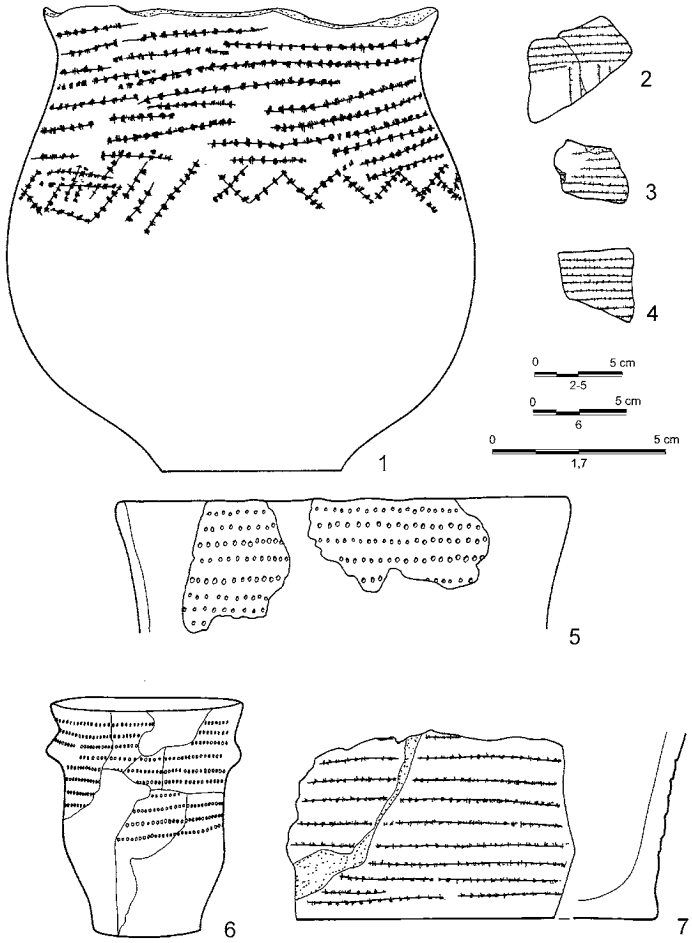

Figure 11. Northern group of the Bell Beakers. Pottery with „barbed wire" ornamentation. Some examples. 1. Boberg (North Germany), 2–4. Gross Uphal (North Germany), 5. Borstal-Hohensande (North Germany), 6. Ziesendorf (North Germany), 7. Aasbuettel (North Germany).

The northern group is characterised by the concentration of Bell Beaker traits in domestic contexts, which indicates that in the course of the latter half of the 3rd millennium cal BC a settlement organization slowly stabilized in Kujawy. This was a major change after a very mobile stage of the Single Grave Culture (Czebreszuk and Szmyt 2008).

One can go even further and claim that the Bell Beakers tradition in the area of interest to us here was a significant accelerator of cultural changes. In western Poland (on the upper and middle Oder) it paved the way ca. 2300/2250 cal BC for the earliest traces of the Únětice Culture (in its proto-Únětice phase) found in

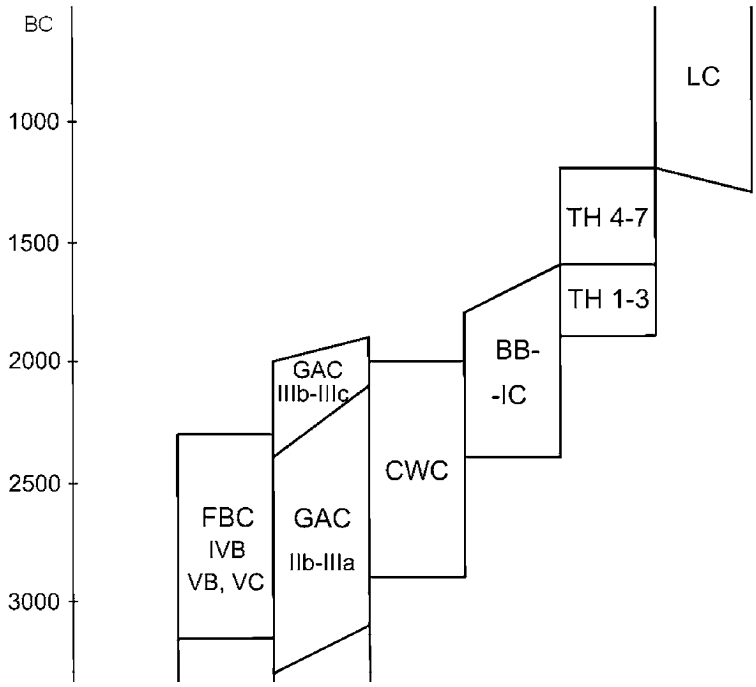

Figure 12. Synchronization of the different cultural structures from the end of the Neolithic and the beginning of the Bronze Age in Kujawy. FBC – Funnel Beaker Culture, GAC – Globular Amphorae Culture, CWC – Corded Ware Culture, Bell Beaker-IC – Bell Beakers – Iwno Culture, TH – Trzciniec Horizon, LC – Lusatian Culture.

Silesia (Machnik 1977). In the course of time its enclaves appeared in Kujawy (Kośko 1991) and on the lower Oder (Kośko 1991) as well. Particularly in Kujawy a symbiosis can be observed between the societies of the Bell Beaker north group, particularly well visible in pottery and settlement, and the Únětice Culture, to which one should link a concentration of bronze objects in Únětice style (Czebreszuk 1996). At the turn of the 3rd millennium cal BC the regional uniqueness of Kujawy is stressed by the distinction of a separate archaeological culture within its borders, the Iwno Culture. It can be interpreted as a local variety of the Bell Beakers network (Czebreszuk 2001), though it was modified by a permanent contact with the Únětice Culture. In this context, it must be observed that Kujawy lay on the route between the 'oecumene' of the Únětice Culture and rich amber deposits located on the Gulf of Gdańsk (Fig. 13; Czebreszuk 2007*a*).

The region was crossed then by a route for long-range contacts, known as the first amber route (Czebreszuk 2007*b*). Interestingly enough, in this period, the early 2nd millennium cal BC, a ma-

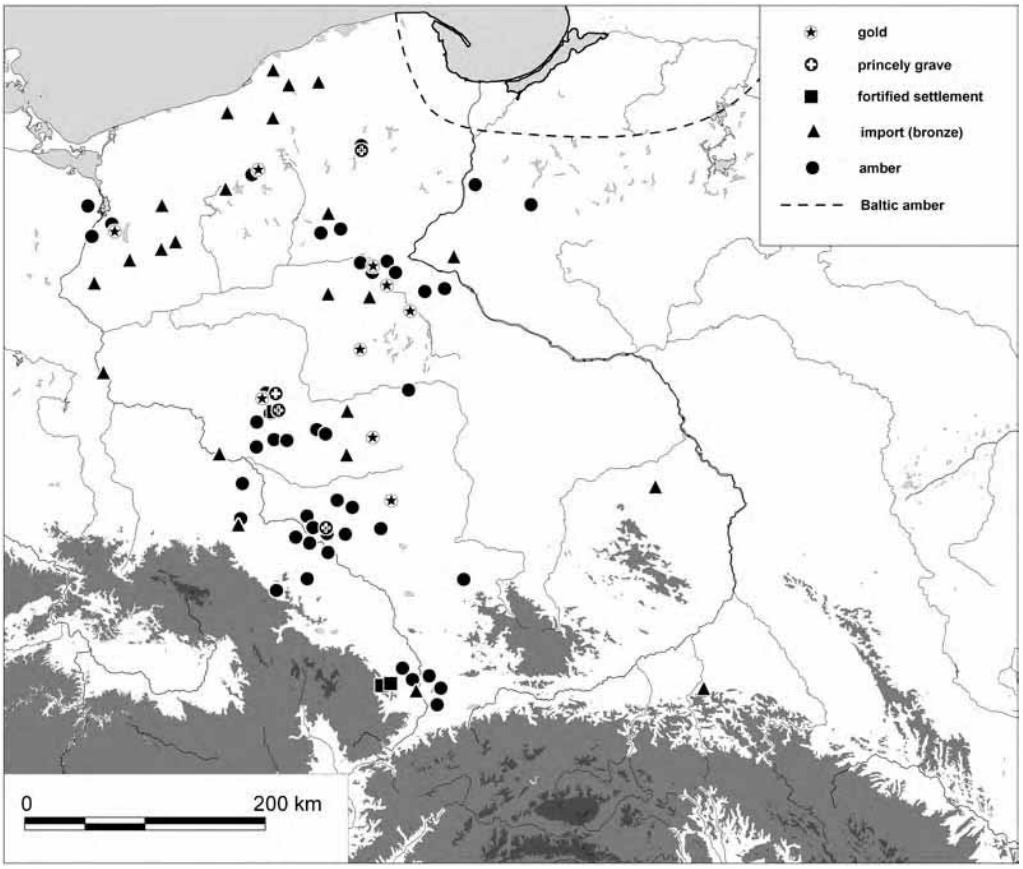

Figure 13. Main roads of long-distance cultural connections in Poland in the Early Bronze Age showed by different kinds of spectacular finds.

jor concentration of spectacular metal and amber goods along the southern Baltic coast shows that the line of contacts joining Jutland to Pomerania and Kujawy was very much alive at that time as well.

In the second half of the 3rd millennium cal BC, in the period of the Bell Beakers, the Polish Lowlands were also settled by other cultural groups such as the Globular Amphora Culture (final phase, cf. Szmyt 1996) and sub-Neolithic societies (Jóźwiak 2003). The relations between the Globular Amphora Culture and the Bell Beaker north group clearly demonstrate a certain regularity. Chronological data tell us that at least in Kujawy both groups co-existed from about 2400 to 2200 cal BC. Given the long period of co-existence in the relatively small region of Kujawy, it is remarkable that there appears to have been a negligible amount of cultural borrowing between the two groups (Czebreszuk 1996, 113-114; Szmyt 1996, 250-251). This can not be explained in terms of low research intensity because

Kujawy is one of the most thoroughly studied regions of Europe with respect to the Late Neolithic and the Early Bronze Age. The most plausible explanation of this discrepancy is to hypothesize a significant cultural barrier between the Globular Amphora Culture and the Bell Beakers. The barrier effectively isolated the two societies from each other during their hundred years of parallel subsistence in the region.

Summing up, what must be emphasized is the heterogeneity of Bell Beaker traits found in the regions of modern-day Poland in the latter half of the 3rd and in the early 2nd millennia cal BC. They were a result of contacts with three different external centres: Moravia (Małopolska enclave), the Bohemian Basin (Silesian concentration) and Jutland (western portion of the Polish Lowlands: Kujawy, Pomerania and Wielkopolska). The concentration on Lowlands supplies us with the most information on the place of the Bell Beakers within the local cultural substratum. For this region, one can suggest a cohesive model of relations between the Bell Beaker phenomenon and other cultural entities present in the region (Fig. 14).

Here the Bell Beaker north group fits into the local sequence of long cultural changes, beginning with the Mesolithic and picking up pace with the advent of the Corded Ware Culture (early 3rd millennium cal BC). It is genetically related to the preceding stage of the Single Grave Culture and forms a substratum for the subsequent stage related to the Trzciniec horizon. Thus, a clear cultural connection ("filiation") is established. With respect to phenomena contemporaneous with the Bell Beakers, such as the decline phase of the Globular Amphora Culture as well as the early and classic phases of

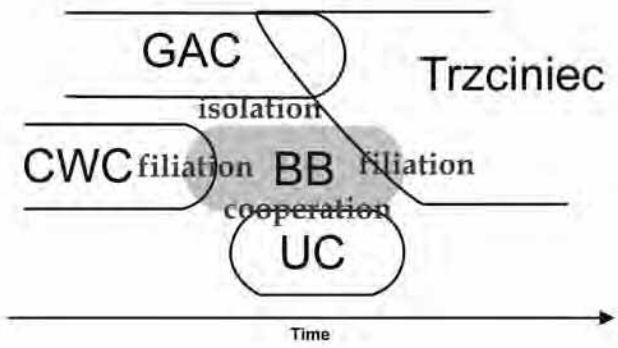

Figure 14. Model of relationships of Bell Beakers with other cultures in western part of the Polish Lowlands. GAC – Globular Amphorae Culture, CWC – Corded Ware Culture, BB – Bell Beakers, UC – Únětice Culture.

the Únětice Culture, two different patterns of behaviour can be discerned. With respect to the former, a distance can be observed, resulting in cultural isolation despite the absence of any geographical barriers. With respect to the latter, a cooperative pattern is clearly seen, following from the advantageous location of the Kujawy Bell Beaker enclave on the route heading north, in the direction of amber deposits on the Gulf of Gdańsk. Owing to such location, these communities profited of an easier access to bronze objects made in the Únětice style.

Hence, the example of the western part of the Polish Lowlands clearly shows that the Bell Beaker north group was firmly-rooted in the local cultural substratum and connected by various cultural ties with other groups settling this area.

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Chapter 7

The Bell Beaker phenomenon

Meanings of regional transmission

Katarzyna Mikołajczak and Radosław Szczodrowski

Abstract

The Bell Beaker phenomenon has always presented a very interesting problem. Due to the extensive geographical distribution of the cultural elements, it shows us large scale intercultural relations. The Bell Beaker phenomenon is incorporated in many different local traditions, modifying them to a lesser or greater extent, though never creating a wholly new quality.

This study interprets the prehistoric phenomena using the achievements of related sciences. The archaeological sources say very little "about themselves", so it is important to analyse this phenomenon in compliance with humanistic factors.

Keywords

Semiotics, Bell Beaker phenomenon, culture memory, communication, translation, cultural text

Introduction

The issue of Bell Beaker phenomenon is a topic widely discussed in European archaeology. The mysteriousness of the issues even shows in some of the titles: "Technological, ideological or economic European union?", "Invasion? Fashion? Social rank? (..)" (compare Nicolis 2001), "Polythetic networks, coherent people: a new historical hypothesis for the Bell Beaker phenomenon" (Vander Linden 2004, 35-62). The present study does not aim to propose yet another alternative model of interpretation of the phenomenon. Its main task is to draw attention to important aspects of interpersonal communication that should be taken into account while interpreting the phenomenon.

The considerations of this article will be based on the assumption that potsherds associated with the Bell Beaker phenomenon were elements of rituals, a manifestation of which is the characteristic form of pottery that is present in funeral contexts.

In archaeological terms, by Bell Beaker we will refer to a set, a package of defined cultural behavioural patterns which today are only visible only in archaeological strata, but in the past were probably present in many other aspects of socio-cultural life both tangible and intangible. Most of these aspects we are unable to grasp, yet it seems that it is worth to think about them and assume their existence. This may have been a set of behaviours, gestures, and artefacts, those which survived to our time creating archaeological data as well as those that have not survived. At the same time, from the spatial extent and short time span of its presence in the culture of local communities we can deduce its strength. Today such a phenomenon could be considered for example as *fashion*, but in archaic culture we are rather dealing with a magical nature of traditions (cf. Kowalski 1999; Kadrow 2006, 134). A social process which we today understand as associated with *fashion*, did probably not exist in the past. The wide distribution in such a short time period of certain meanings linked not so much with vessel itself as with ritual in which these vessels – beakers had its share, demonstrates their strength, as a signal probably of a religious nature.

It seems important to note that while spreading over Europe, the bell beaker enters into many different traditions, modifying them to a lesser or greater extent, however, never creating a completely new quality. Also, local traditions, local "cultural memory" modify it, but never in full extent and only in certain areas, e.g., so-called *Begleitkeramik* or regional differentiation of the bell beakers' shape.

Ritual

Ritual concerns social actions, human behaviour, and involves "*exercising of more or less invariant sequences of formal acts and utterances*" (Rappaport 2007, 52-53). All behaviours taking place within its conduct should be regarded as codes of information that should be analysed contextually (Rajewski 2006, 59). According to Victor Turner, ritual is characterized by information of both metaphorical and concrete nature, contained among other in the symbolism of constituent objects and gestures (Pawlik 2006, 25-26). According to R. Rappaport, these objects and gestures embody the most abstract human thoughts and feelings (Rappaport 2007, 210-213). They are a statement and a communication tool at the same time; a communication tool because creating a ritual builds cultural information. Specific gestures, objects, ritual actions are like individual letters of an alphabet forming words, the latter in turn forming sentences, while all together they form a cultural text. In turn, this cultural text is understood and received in full only by the members of the same social group as the creator of that text.

When studying archaeological phenomena of this kind, its worth to relate to culture's semiotics. According to Łotman and Uspienski (1977*a*), human culture has, beyond genetic resources, a collection of information, which we could call "culture memory". The memory of a culture consists of both culture's "texts", as well as the culture's contained principles for generating cultural codes. When it reaches a culture, an element (text) extends its memory. Seen from the archaeological point of view a new cultural element (artefact, part of the ritual, *etc.*), together with what follows (what it means, to which it refers) may enlarge the resource of culture's elements or replace some of it.

Over a period of time the history of culture's elements (e.g., artefact) may experience some dynamics:

- over time a culture element may have the same form and the same content,
- over time a culture element may have the same form, but different content (the cultural code changes),
- over time a culture element may have the same content but a different form, (cf. Łotman and Uspienski 1977a).

These rules may be associated both with the change of culture within itself and with the change of culture caused by an external factor.

Accordingly, when interpreting material culture correlates by means of archaeology, we must remember that in different cultural contexts these posses a potential dynamic of occurrence and development.

At this point it is important to note the way in which this information (cultural text) transmit from one social system to another. According to Łotman and Uspienski "implementation of the fact to social memory, has all the characteristics of translation from one language to another, in this case to 'cultures language'" (Łotman and Uspienski 1977*a* , 151).

Considering a meeting of two social systems, which generally do not use identical systems of meanings and values (such as letters of the Roman and Greek alphabets), a communication must be based essentially on its translation (Ziemieńska-Sapija 1987, 70-71). Often it is necessary to translate information from the language of the sender to one comprehensible for the recipient (Rappaport 2007, 149). Yet, through such a process we loose the most important thing, the original meaning (Gadamer 2007, 520-523). Communication is incorporated into another sequence of information as its new component part. The degree of conversion of that message in relation to the original, depends on the strength of information conveyed, for example, an item that fulfils a ceremonial function in one community may fulfil an aesthetic function in its new context (Ziemieńska-Sapija 1987, 70).

On the basis of archaeological sources capturing such a transformation is surely not easy but at a certain level of abstraction is also not impossible. Observable indications of the discussed phenomena of transformation include, for example, morphological change of an object (adaptation of a foreign shape, decoration motif, *etc.*) in relation to the original, or the change of context of the same item in the new social systems.

Translation

In schematic terms, the translation process means translation of the cultural text from "foreign" to "local" language. Thus, in its simplest form this process presupposes the existence of at least two alien systems (communities, values, *etc.*). When interpreting the prehistoric phenomena of this period it is worth to note the local cultural traditions and non identical perceptions of the Bell Beaker ideas in different regional contexts. The arguments stated above may be an acknowledgment of the possibility of the existence of such translation processes.

These ritual behaviours and objects associated with them are a form of message and a communication tool at the same time. They are a communication tool because they create a ritual connected with the burial domain, they create specific cultural information, perceived and understood fully only by members of the same social group as that of the text creator.

As was already indicated, two different social systems generally do not use synonymous systems of meanings or values, and therefore of intercultural contact: communication of information must be based on a translation. According to Gadamer, an important feature of the translation process is that each process leads to a loss or distortion of the original wording of the cultural text. Moreover, translation is also "clearer and simpler" than the original, because it leads to selection of content. Translation presents the main features of the original, omitting a number of additional features (Gadamer 2007, 523). This is due to differences between the subject (semantically foreign cultural text), and an entity investigating it (the recipient of the text). In order for a cultural text to be adapted to new socio-cultural realities, to interpret it, its recipient has to introduce his own preliminary concepts, based on his own cultural tradition (Gadamer 2007, 537).

Another example of translation of cultural content, referring to subject of research analysed in this text, is the process of reproduction/imitation. According to Gadamer, the process of reproduction is a specific example of interpretation, in an illustrative sense, because its main purpose is a demonstrative exposure/exaggeration of the original content (Gadamer 2007, 541).

In our case, at least at the level of archaeological data, the essence of the "original" seems to be a defined form of vessels.

Relationships taking place in the process of cultural translation can be summarized as follows:

1. The Bell Beaker package is incorporated into the new community in a form that is identical in context, wherein the essential structure of the new ritual is unchanged
2. The Bell Beaker package is incorporated into the new community in a form that is identical in context and the structure of a new ritual is deformed
3. The Bell Beaker package is deformed

Cultural traditions of 3rd millennium cal BC and Bell Beaker phenomenon

As an example of the proposed concept we would like to introduce the phenomenon described here entering into various "structures of long duration", as we can define different funeral traditions of Europe 3rd millennium BC (especially the megalithic tradition). It seems that the Bell Beaker phenomenon was not formed and develop in a vacuum, only that it imposed itself very strongly on other cultural traditions present in Europe in the 3rd millennium BC.

Probably the Bell Beaker phenomenon circulated and come into different cultural traditions through a network of interregional interaction. In this model it cannot be excluded that the people moved, just as did the ideas. However, it seems, these were rather intentional movements conducted in accordance to certain rules (*i.e.*, trips associated with the exchange of goods, *etc.*).

In this model of interaction it should also be assumed that the character of the alien culture of the recipient is open to receive. The second assumption, which may complement the first, is that the nature of the transformation process was strongly imposed on the culture of the recipient.

Example 1

The first example is the area of Western Europe and the Mediterranean as areas of older, well-established megalithic traditions. The burial tradition of this zone can be defined as "a structure of long duration". Within this existing funeral tradition, the main novelty is the appearance of the Bell Beaker and associated range a pottery forms. In this case, a set of cultural and social practices associated with the Bell Beaker did not alter the fundamental structure of the ritual – and furthermore – it underwent a mild translation, blending into the elements of earlier culture (Fig. 1).

Another case in point is the incorporation of the Bell Beaker in the cremation custom of the Hungarion region (Csepel group; cf. Kadrow 2001; Kalicz-Schreiber and Kalicz 2001; Machnik 1987).

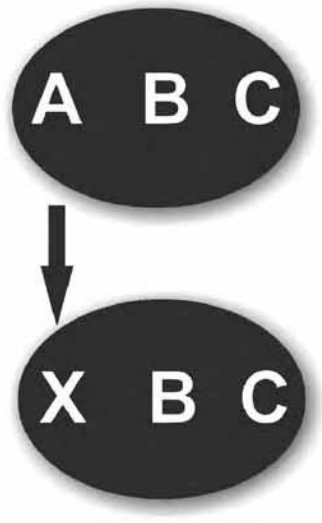

Figure 1. Translation process: megalithic tradi-

The cremation rites in this area may also be viewed as a structure of long duration. It seems that for the local community the custom of burning corpses of the dead, was an strong axiological element of tradition, as even in the "clash with the Bell Beaker idea" it has not been deformed. Just as in the first case, the Bell Beaker package did not change the structure of local ritual (cremation remains), and only got incorporated (translated) into the indigenous traditions. Cremation graves are an archaeological example of this process, in which apart of the pottery of local character, bell beakers are also present (Kalicz-Schreiber and Kalicz 2001, 442).

Example 2

The second example is the area of Central Europe. In terms of archaeology, there we can observe the existence of restrictive rules for burial.

1. The principle orientation of the corpse, N-S – men lying on their left side with their head to the north , S-N – women lying on their right side with their head to the south, in both cases facing the east.
2. The embryonic position of the skeleton.
3. A set of artefacts belonging to sex: nodules with a V-shaped hole, awls, metal ornaments - a women; copper daggers, quadrilateral plates, curved objects interpreted as a pendant – men (cf., Müller 2001; Turek, and Peska 2001; Harrison 1980)

An important observation for those areas is the strict compliance of signalled rules and their differences against the rules prevailing in the same area in earlier time (Fig. 2).

Looking at the cultural change that is made visible in figure 2, it seems that a set of features accompanying the Bell Beaker on one hand fits into the overall structure prevailing in the previous period, *i.e.* the structural opposition of female-male, ornaments-weapons, an embryonic position of the skeleton. On the other hand, it seems that the entry of the Bell Beaker phenomenon reverses the whole ritual and, going even further, perhaps this could be extrapolated to the whole culture. Changes related to the reversal of the orientation and the position of the dead appear to be extremely important in the context of cultural axiology. For instance placing the corpse of women on the right side and of men on the left is a reversal of the likely pre-Indo-European principles of valuation of left and right and male and female.

Therefore a reverse of the culture values is likely here, an attempt to break away from the existing cultural traditions. Similar profound changes of culture to "reverse" are known from history – such as the

	Bell Beaker Culture	Cord Ware Culture
Similar symbolic background	inhumation burial in the contracted position	
	uniform funeral assemblage	
	Funeral ceramics is different to those from domestic-settlement context	
	ceramics is more common in male graves	
Orthodox burial rites	N-S	E-W
	Female on the right side/S	Female on the left side/E
	Male on the left side/N	Male on the right side/W
	faces oriented to the west	faces oriented to the south
	location of cemeteries: N-E slopes	location of cemeteries: S-E slopes
Gendered assemblages	Female: ceramics, necklaces, hair ornament. buttons	Female: ceramics, necklaces, hair ornament. buttons
	Male: ceramics, copper daggers, archery equipment	Male: ceramics, battle-axes

Figure 2. Restrictive burial rites: Bell Beaker and Cord Ware Cultures

Akhenaton's revolution in Ancient Egypt (Eighteenth dynasty), bipolar changes in Russia, practically since the Middle Ages to the present (Łotman and Uspieński 1977*b*), and today (communism – capitalism change in societies of Eastern Europe). Analysing similar profound changes of culture to "reverse" the parameter culture Łotman talks of the binary model of cultural change, assuming nearly complete strikeout of the existing cultural traditions. A new phase aims to completely eradicate the previous one, and a reversal of the significant culture elements reinforces this process in the symbolic domain (Łotman 1999). In both cases, assuming that impulses carrying the Bell Beaker were the same, we see a different way of adoption/adaptation of the Bell Beaker model (Fig.3).

The opposition of these two examples is consistent with two models of cultural change constructed by Łotman and Uspienski (1977*b*). In the first model the earlier period culture's deep structure is preserved, but it is subject to change, while preserving its basic structural parameters. In the second model the deep structure of the culture itself changes, however, being dependent on the earlier cultural pattern in such a way that a new cultural model is built in

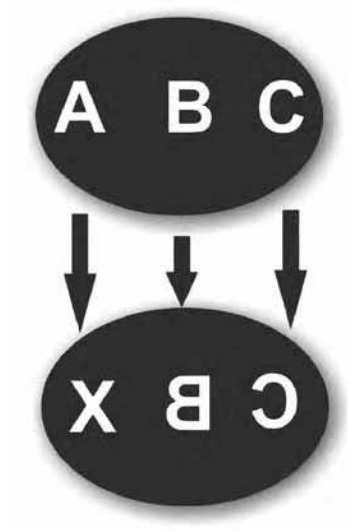

Figure 3. Translation process: the model of adaptation of the Bell Beaker idea in Central Europe.

contradiction to the previous one (Łotman and Uspienski 1977*b*). Here an example can be made of different nature of change from paganism to Christianity in medieval Eastern Europe. On one hand, Christianity as a new cultural impulse was translated/adopted onto the old cultural structures – thus a function of a ritual place was the same hierophant character as before, yet Christian saints became counterparts to pagan deities. On the other hand, for the new religion pagan holy places could be considered tainted – thus the function is reversed.

Archaeological examples presented above demonstrated individual reception of the Bell Beaker characteristics in three different cultural environments. Once the base of the form of reception/adaptation of the new ideas we can also try to conclude the character of a culture into which the Bell Beaker tradition enters. The megalithic tradition, and the cremation tradition associated with the Csepel group are stable in appearance and open to foreign models, which on coming to them are "translated" and included in local traditions. On the other hand that part of Central Europe that was formed in the tradition of Corded Ware culture seem to be less stable, more enclosed, and in a due course susceptible to intensive changes in the deepest structures of culture.

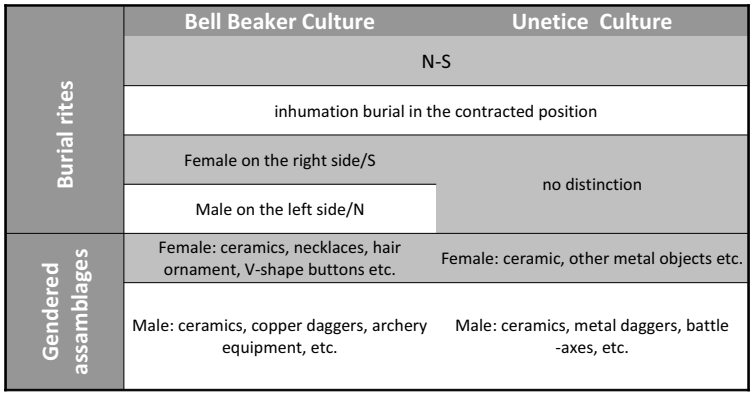

Figure 4. Burial rites: Bell Beaker and Unetice Culture.

Example 3

The last example is the process of experiencing the Bell Beaker features by another archaeological unit that is the Unetice culture (Fig.4).

Among its characteristics we can distinguish those alluding to the Bell Beaker tradition: the alignment of a dead person in the grave in N–S orientation as well as the embryonic position, differentiation of funerary artefacts belonging to sex, or the practice of reusing old graves, which emerge in the Bell Beaker period and subsequently gain in frequency (cf. Kruťová 2003).

This example should be considered differently than previous ones, because of the time elapsed since the emergence of the Bell Beaker tradition.

Bell Beaker culture seems to be a less active cultural element as compared to a new tradition, which basically changes most of the funerary ritual parameters. The form of a bell beaker probably ceased to represent the meaning which it was associated previously. It probably represents only a past form, beneath which the old cultural code lays no more. The culture-creation role of funerary tradition was assumed by different elements.

Conclusion

The above presentation of the Bell Beaker phenomenon is merely a contribution to further discussion on the possibility of analysing archaeological (material) sources, considering other aspects of their testimony. Archaeological sources say very little "about themselves", thus it is necessary to employ the achievements of related sciences.

Human culture is an open system, whose characteristics develop, change, disappear both with the participation of external impulses as well as internally within itself. Cultural change visible in archaeological sources, which is held with the participation of the Bell Beaker (perhaps, not only on the material/artefact level, but also on mental and ideological plains), can attest the value of information associated with the Bell Beaker phenomenon. In addition, the dynamics (time) of the propagation of cultural information evident under a specific vessel form, additionally supports the assumption about the strength of the values inherent in and identified with the phenomenon.

The Bell Beaker phenomenon example shows us a greater scale intercultural relation intensity than we ever assumed and that we should analyze in compliance with humanistic factor.

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Chapter 8

Origin of the Bell Beaker phenomenon

The Moroccan connection

Jan Turek

Abstract

Since the mid-3rd Millennium BC the Bell Beaker phenomenon was spanning the vast area from Northwest Africa to the hearth of Carpathian Basin. One of the earliest Beaker styles is the "Maritime tradition" that probably originated from the Early Copper Age "*Copos*" in the area of the mouth of the River Tajo in Portugal. The pedigree of the specific Bell Beaker stamped decoration may be found in the northwestern Morocco Late Neolithic cemeteries of Skirat and El Kiffen. It is therefore possible that the origin of the Bell Beaker phenomenon was based on the cultural communication between the northwest Africa and Estramadura. The Maritime style of the earliest Bell Beakers arrived from the Iberian Peninsula in the Lower Rhine region where the Beaker tradition, symbolism and perhaps ideology already existed in the form of the late Corded Ware (SGC) beakers. This stylistic impulse was adopted into the continuous development of the Beaker concept.

This hypothetical model was not yet proved and tested and it is facing range of problems, such as lack of radiocarbon dates for Moroccan beakers. Or for example the lack of Bell Beaker finds in Algarve, dividing the Estramadura from Western Andalusia (Cadiz region, south of the Guadalquivir River), where we could presume a natural connection to Morocco.

The Bell Beaker decorative style and the "Beaker Package" spread not due to a higher mobility of their bearers but thanks their symbolic meaning of decorated beakers and prestigious objects that might have been attached to some kind of ideology. It seems more appropriate to speak about spreading of style and technology rather than migration of people.

Keywords: *Bell Beaker Phenomenon, Bell Beaker origin, Maritime Beakers, Morocco, Estramadura*

The earliest Bell Bakers in Europe and the question of their origin

There are currently two main theories on the origin and formation area of the Bell Beaker phenomenon. The number of evidence lacking theories on the "Fatherland" of Bell Beaker archers exploded during the 20th Century (see Turek 1996; 2006; Salanova 2005, 19-21, with further references). The two theories presented below are far from being definitive and their probability has to be tested by future research. As I am going to argue further on, these two theories are not mutually exclusive and they could possibly work in harmony.

The Dutch Model

According to this model the archetype of bell beaker is seen in the *All-Over-Corded Beakers* (AOC) and *All-Over-Ornamented Beakers* (AOO). Their typological origin is presumed to be in the Late Single Grave Culture *Protruding Foot Beakers* (PFB) appearing in the Lower Rhine area (Lanting and Van der Waals 1976; Fig. 1).

This region is currently the only one in Europe, where it is possible to trace the local typological development from the Corded Ware to the early forms of bell beakers. Such chronological-typological sequence was also supported by series of radiocarbon dates (Lanting and Van der Waals 1976). However, the more recent radiocarbon dates brought doubts about the original model and they even suggest possible development of the local Veluwe beakers (generally considered late) directly from the late Corded Ware/Single Grave Culture background (E. Drenth personal communication 2008). The original model by Lanting and van der Waals needs to be tested on much wider series of local and European radiocarbon dates.

I presume that the Dutch model may be still valid in terms of the Lower Rhine Beaker tradition. This would mean that the Maritime style of the earliest Bell Beakers (described below) arrived from the Iberian Peninsula to the Lower Rhine region where the Beaker tra-

dition, symbolism and perhaps ideology already existed in the form of the late Corded Ware (SGC) beakers. This stylistic impulse was adopted into the continuous development of the Beaker concept.

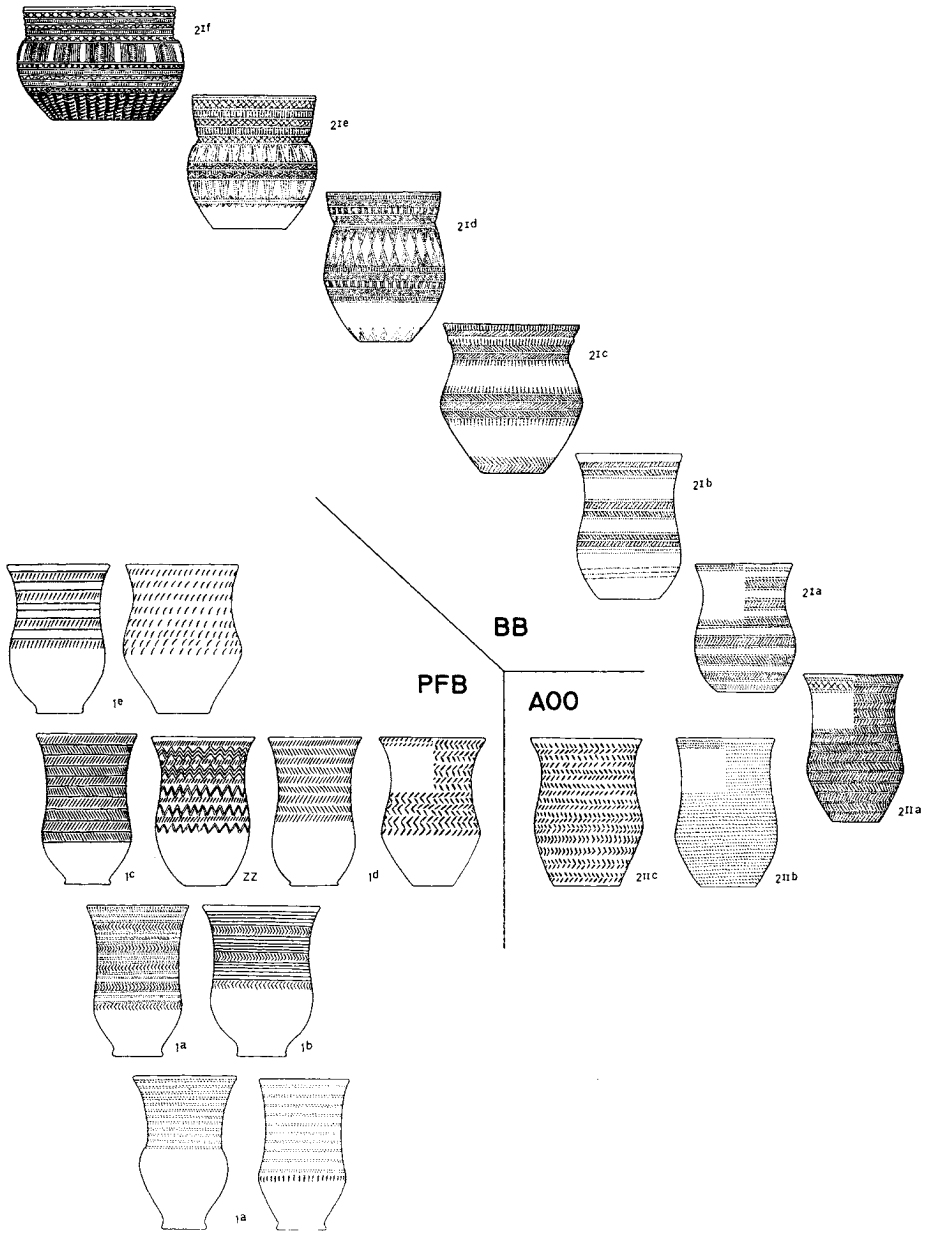

Figure 1. Scheme of the 'Dutch model' (after Lanting and Van der Waals 1976).

The Maritime model

Maritime Bell Beakers are defined as uniformly shaped slim and tall vessels with S-profile and a flat base. Their decoration consists of horizontal bands filled with hatched motives and parallel stamped lines, usually framed by impressions of simple border lines. The decorative bands occur repeatedly over the entire surface and are separated by non-decorated polished bands. In some variants the individual bands may be decorated with a zigzag line. The boundary lines and individual, independent lines might be made by cord impression.

The origin of Maritime beakers is sought in the Portuguese region of Estramadura, in the area of the mouth of River Tejo (Tagus). Maritime beakers appear further north along the Atlantic coast up to Brittany, easterly through Languedoc along the French Mediterranean coast (Salanova 2000). The Maritime style is less represented in the Eastern Bell Beaker Province, for example in Bohemia and Moravia (Hájek 1966; Turek 2008). Despite some very early Bell Beaker radiocarbon dates recorded in the western Iberian Peninsula (Müller and van Willigen 2001), there is no evidence of continual typological sequence leading towards Maritime Beakers in Estramadura. Certain clues may be seen in cylindrical cups with rounded base and curved body, so-called *"Copos"* (Fig. 2) that Sangmeister and Schubart (1981) considered to be imported burnish decorated ware at the fortified site of Zambujal.

Within the Zambujal stratigraphy (Sangmeister and Schubart 1981; Kunst 1987) and at similar fortified sites of Rotura (Kunst 1995, 148) and Leceia (Cardoso 1989) it is possible to date these *"Copos"* to the earliest phase of the following sequence:

I. Early Copper Age – "*Copos*" horizon, so-called horizon of Iberian channelled ware.
II. Middle Copper Age – horizon of acacia leaf decoration motif.
III. Late Copper Age – Bell Beaker horizon.

This general chronological sequence was adjusted by Michael Kunst (1995), based on detailed analysis of pottery finds from Zambujal, especially in relation of the cylindrical cups „*Copos*" and Maritime beakers. His study is summarized in the following sequence:

I. Cylindrical cups independently
II. Cylindrical cups - common + serrated leaf motif wear – rare.
III. Cylindrical cups – common + serrated leaf motif wear – common + bell beakers - rare.
IV. Serrated leaf motif wear – common + bell beakers – common + cylindrical cups - rare.
V. Bell beakers - common + serrated leaf motif wear – fairly rare + cylindrical cups - very rare.

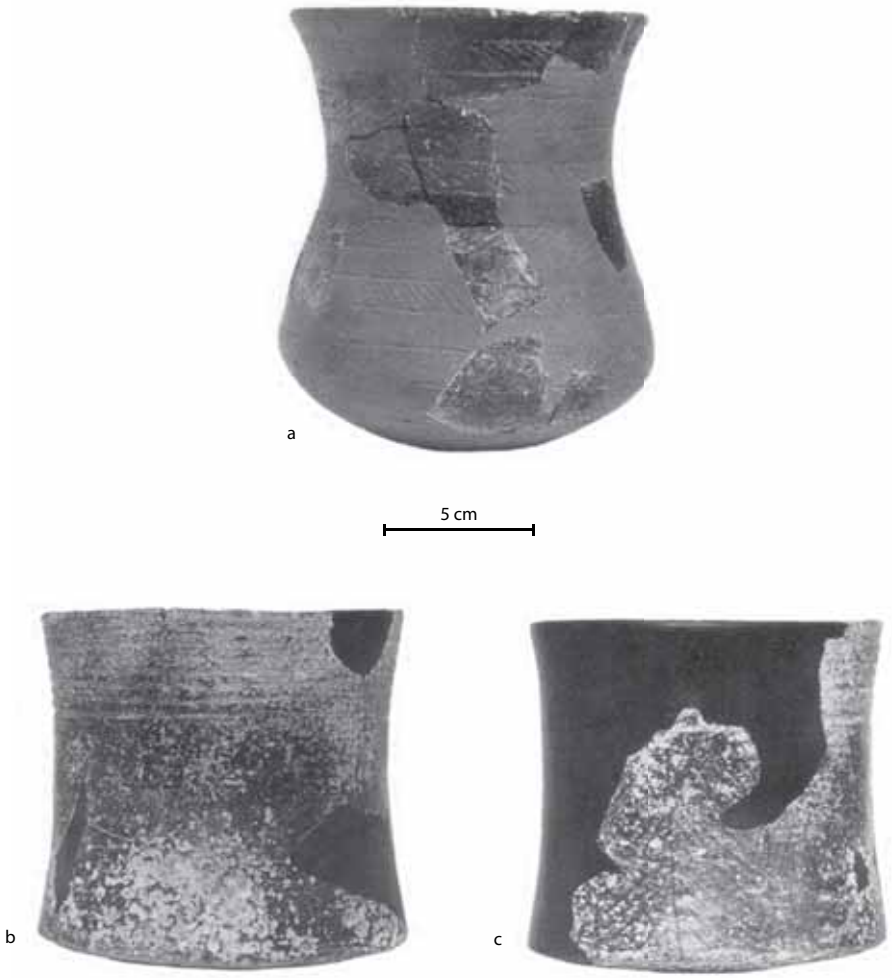

Figure 2. Zambujal (Portugal), Maritime beaker – top, perhaps derived from earlier "copos" - bellow (after Kunst 1995, taf. 13).

Michael Kunst (1995) emphasized the significance of "*Copos*" as a typological archetype of Maritime beakers and argues that these cylindrical cups might have been in use prior to the introduction of bell beakers (I. and II.), during their formation period (III.) and "survived" also in the period of fully developed bell beaker style (IV. a V.). Certainly one could argue that the burnished decoration of cylindrical "*Copos*", or so-called serrated leaf motif could not be considered as an archetype pattern of the bell beaker stamped technique. I presume that the solution of this question may be found in the abandonment of the traditional attempts to determine one particular region of the origin of Beaker phenomenon. It is possible to imagine that Bell Beaker style has not originated in one single

region, but was established as a synthesis of elements from more different regions. If we assume that their formal genesis took place in the Midwestern Iberian Peninsula, then the nearest source of typical stamped decoration could be found in the Late Neolithic pottery of Sahara Maghreb, the territory of present day north-west Morocco. In this context, the Bell Beaker style as it was known from the European continent was distributed later. There are two cemeteries on the Moroccan Atlantic coast dated roughly into the mid-4th and beginning of the 3rd Millennium BC. For these cemeteries pottery is characteristic with a bell beaker style stamp decoration (Camps-Fabrer 1966, pl. XLIII) that is identical with the later Bell Beaker ornament in the region of northern Morocco and in Europe. The cemetery at Skhirat – de Rouazi is located on southern outskirts of the Moroccan Capital Rabat. With 101 inhumation burial and total number of 132 pottery vessels (Fig. 3-5) it represents yet the richest site of the "pre-campaniforme" horizon in Morocco (Lancombe and Daugas 1988).

Figure 3. Moroccan Late Neolithic pottery from the cemetery at Skhirat – de Rouazi (photograph by J. Turek, by courtesy of the Rabat Archaeological Museum).

Figure 4. Moroccan Late Neolithic pottery from the cemetery at Skhirat – de Rouazi (photograph by J. Turek, by courtesy of the Rabat Archaeological Museum).

Figure 5. Moroccan Late Neolithic pottery from the cemetery at Skhirat – de Rouazi (photograph by J. Turek, by courtesy of the Rabat Archaeological Museum).

Figure 6. Detail of the Bell Beaker style decoration of the Moroccan Late Neolithic pottery from the cemetery at Skhirat – de Rouazi (photograph by J. Turek, by courtesy of the Rabat Archaeological Museum).

Figure 7. A Ciempozuelos type Beaker from the Dar-es-Soltan I cave in Rabat (photograph by J. Turek, by courtesy of the Rabat Archaeological Museum).

The second site uncovered at El-Kiffen, southwest of Cassablanca, is an abri/cave cemetery. Here 43 pottery vessels were found together with inhumation burials. Not entirely reliable (TL) absolute dates set the interval 3350-2660 BC (Bailloud *et al.* 1964). The decoration (Fig. 6) that is characteristic for the Moroccan Late Neolithic/

Figure 8. Youssef Bokbot and Jan Turek before the entrance of the Dar-es-Soltan I cave in Rabat (photograph by M. Turková).

Chalcolithic (Camps-Fabrer 1966, pl. XLIII) has no analogy in the European Prehistory apart from the Bell Beaker Period.

We have to bear in mind that the majority of bell beakers in this region are of fully developed Spanish Ciempozuelos style (Bokbot 2005). A well preserved example of such Ciempozuelos beaker (Fig. 7) comes from the Dar-es-Soltan cave located on outskirts of Rabat (Fig. 8).

The number of Maritime Beakers currently known from Morocco is limited (Harrison 1977, 41-42). There are only two sites in the coastal area of Northern Morocco represented by Maritime Beakers. They suggest the relations to the Tagus estuary region in Portugal: Kahf-Taht-el-Gar (Tarradell 1957-1958) and Gar-Kahal (Harrison and Gilman 1977, 91-104; Bokbot 2005, fig. 3). However, the current state of knowledge on Moroccan and Algerian Bell Beakers is rather limited.

Seen from this point of view it is possible that Bell Beaker phenomenon, such as we know it from Western and Central Europe, originated in the first half of the 3rd millennium BC based through cultural communication between the Northwest Africa and Estramadura. This hypothetical model was not yet tested and it is facing range of problems, such as lack of radiocarbon dates for Moroccan beakers. An other problem the lack of Bell Beaker finds in Algarve dividing Estramadura from the Western Andalusia (Cadiz region, south of the Guadalquivir River), where we can presume a

natural connection to Morocco. The resolution of such a hypothesis would require a targeted systematic research project covering the whole area mentioned above.

Conclusion

Discussing the origin of the Bell Beaker phenomenon we have to bear in mind that there are several components that defines it. On one hand it is the specific Bell Beaker style, characteristic pottery and decoration, on the other hand there are some other artefacts accompanying the beakers, such as copper tanged daggers, stone wristguards or bone buttons coming from different parts of the Beaker World. However, it needs to be emphasized that the phenomenon consists not only of different elements of material culture but mainly of uniform system of burial rites, social organisation and perhaps of shared ideology connected to beakers an ritualised consumption of alcoholic (?) beverages (Turek 2005). These elements are of different origin, some of them adopted from predecessors or neighbours, others representing the Bell Beaker idea as such. The synthesis of these elements is creating the Bell Beaker phenomenon, which is, however, not representing an archaeological culture covering vast areas of Europe and North Africa, but rather an idea and style uniting different regions with different cultural traditions and background. This is well visible when we compare the subsequent development in different regions after the decline of the Bell Beaker phenomenon. While most of the Eastern Province continued in the local common ware tradition (*Begleitkeramik*) after 2300 cal BC (Únětice, Nagyrév) the bell beakers disappeared with no visible impact in the local pottery sequence. Different development of the Bell Beaker tradition may be observed for example in the British Isles, where the Early Bronze Age food vessels carry some stylistic traditions of the Bell Beaker pottery. A similar difference between the west and east Bell Beaker zone appears in the tradition of funerary rituals. While in the east individual single graves continue (Nitra, Únětice), the western zone is partly returning to the creation of new collective graves, as well as, re-use of the earlier 3rd Millennium collective graves. This is the case, for instance, in the Paris Basin (Salanova 2004, 73-74, fig. 7). Laure Salanova also observed that the "foreign" (Bell Beaker) elements were never integrated in the local culture and that they were rather superimposed on it.

So while the Maritime Beakers are clearly a south-western element (Case 2004, 14, with further references), The symbolic system of the burial rites is based on the eastern Corded Ware and even earlier Yamnaya tradition (Harrison and Heyd 2007, 193-199, fig. 45). Maritime Beakers were thus only one investment into the creation

of a new phenomenon together with the tradition based on already existing symbolic system of individual burials under round barrows, emphasizing gender and social position of individuals and sometimes their craftsmanship, solar cult and drinking beakers. For the casting of such a new phenomenon the Lower Rhine area was perhaps important, as it was the westernmost region with occurrence of the Corded Ware (SGC). There it was the AOC and AOO beakers that together with the Maritime beakers created a new Bell Beaker style. This establishing process was result of the cultural interaction between Iberian Peninsula and Lower Rhine region.

So if the question is where and when the Bell Beaker (Maritime) style originates from, than we have to state that it was in first half of the Third Millennium BC between Estramadura and Morocco, but if the question is where was the Bell Beaker phenomenon created it needs to be said that it was before the Mid-third Millennium as result of communication between the Maritime style in Portugal and the western late Corded Ware groups.

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My gratitude and memory goes especially to Humphrey J. Case who was for six decades the good spirit of the European research on the Bell Beaker phenomenon. He never became rigidly devoted to any old paradigm and was always trying to find an alternative approaches towards reconstruction of prehistoric society and changes in material culture. Our numerous discussions on Bell Beakers and related topics helped me to shape my ideas on the question of the meaning and origin of this extraordinary phenomenon in European Prehistory. I am also grateful to Youssef Bokbot and Abdeslam Mikdad (both from University of Rabat) for their time and effort in introducing me into the Moroccan Chalcolithic and Bell Beaker Period. I also thank to Magdalena Turková, Michael Kunst, Erik Drenth and Volker Heyd for inspiring discussions on the topic of this paper.

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Background to Beakers

Background to Beakers is the result of an inspiring session at the yearly conference of European Association of Archaeologists in The Hague in September 2010. The conference brought together thirteen speakers on the subject *Beakers in Transition*. Together we explored the background to the Bell Beaker complex in different regions, departing from the idea that migration is not the comprehensive solution to the adoption of Bell Beakers. Therefore we asked the participants to discuss how in their region Beakers were incorporated in existing cultural complexes, as one of the manners to understand the processes of innovation that were undoubtedly part of the Beaker complex.

In this book eight of the speakers have contributed papers, resulting in a diverse and interesting approach to Beakers. We can see how scholars in Scandinavia, the Low Countries, Poland, Switzerland, France, Morocco even, struggle with the same problems, but have different solutions everywhere. The book reads as an inspiration for new approaches and for a discussion of cultural backgrounds instead of searching for the oldest Beaker.

The authors are all established scholars in the field of Bronze Age research. Of the editors Harry Fokkens is a professor of European Prehistory at Leiden University and well known for his research in the Low Countries and in a broader European context. He published several books on settlement research, amongst others Bronze Age settlements in the Low Countries (Oxbow 2008, with S. Arnoldussen). Franco Nicolis is the Director of the Heritage Office of the autonomous Province of Trento and published many articles and books on Bell Beakers. He was the organiser of the conference *Bell Beakers today* (Riva del Garda 1998) and published a two volume book on the conference (2001).

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